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## Improving Diversity, Inclusion, and Representation in Radiology and Radiation Oncology Part 1: Why These Matter

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### Abstract

The ACR Commission for Women and General Diversity is committed to identifying barriers to a diverse physician workforce in radiology and radiation oncology (RRO), and to offering policy recommendations to overcome these barriers. In Part 1 of a 2-part position article from the commission, diversity as a concept and its dimensions of personality, character, ethnicity, biology, biography, and organization are introduced. Terms commonly used to describe diverse individuals and groups are reviewed. The history of diversity and inclusion in US society and health care are addressed. The post–Civil Rights Era evolution of diversity in medicine is delineated: Diversity 1.0, with basic awareness, nondiscrimination, and recruitment; Diversity 2.0, with appreciation of the value of diversity but inclusion as peripheral or in opposition to other goals; and Diversity 3.0, which integrates diversity and inclusion into core missions of organizations and their leadership, and leverages its potential for innovation and contribution. The current states of diversity and inclusion in RRO are reviewed in regard to gender, race, ethnicity, sexual orientation, and gender identity. The lack of representation and unchanged demographics in these fields relative to other medical specialties are explored. The business case for diversity is discussed, with examples of successful models and potential application to the health care industry in general and to RRO. The moral, ethical, and public health imperative for diversity is also highlighted.

## Keywords

Diversity; health disparities; health policy; radiation oncology; radiology; underrepresented minorities

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## INTRODUCTION

Diversity and inclusion have long been recognized as important strategic tools that enable institutions and organizations to excel, through enriched collaborations, innovation, and growth. The Civil Rights Era eliminated most of the overt legal exclusion of underrepresented minorities and women from many opportunities and culminated in recruitment efforts and affirmative action programs; in academic medicine, this phase has been described as Diversity 1.0. In the 1980s, appreciation of the social and educational dividends of inclusive organizations increased, as did majority awareness of the contributions of women and minorities. In Diversity 2.0, however, these efforts remained outside the core missions of businesses. Now, organizations increasingly seek to leverage diverse talents; focus on differences beyond race and gender; integrate inclusion into their culture and diversity into their core mission; and measure performance of the organization and its leadership in terms of success in maintaining diverse representation [1]. The ACR Commission for Women and General Diversity was created as a Diversity 3.0 initiative, to contribute to the core mission of the ACR, and to leverage diversity to improve our patients' care and our service to our profession and colleagues [2,3].

The Commission here reviews the current status of diversity in radiology and radiation oncology (RRO). Part One focuses on the moral imperative and business case to promote and leverage diversity. Part Two centers on challenges related to career advancement of minorities and women RRO, and offers recommendations for implementation of the Diversity 3.0 paradigm [4].

## DIVERSITY AND INCLUSION: ETHICAL, SOCIAL SERVICE, AND SOCIAL JUSTICE CONSIDERATIONS

To understand the ethics of diversity, it is important to understand the meaning of the word "diversity." Diversity implies variation; if one group is more diverse than another, this implies a greater variety among its members. Commitment to diversity does not mean eliminating differences among individuals or groups, or pretending that they do not exist; rather, a true commitment to diversity means respecting and even celebrating such differences.

### Dimensions of Diversity

Some observers have distinguished among four types of diversity. One is diversity of *personality* and character: some people are outgoing, some inquisitive, and some creative. A second dimension concerns *biology*, such as gender, race, or physical abilities, factors that, by and large, people cannot alter. A third dimension concerns *biography*, such as marital status, parenthood, and leisure activities. A fourth is more *organizational*: in radiology,

these might include a person's undergraduate and professional education and fellowship specialization. Faced with these many dimensions of diversity, it is important that medical groups and health care organizations develop a workforce capable of meeting the diverse needs of the population.

### **The Increasingly Diverse US Population**

The population of the United States is highly diverse, certainly one of the most diverse societies in human history. Some observers have longed for a society in which such differences would be gradually assimilated and blended together into a homogeneous citizenry, the notion behind the great melting pot. A more fitting metaphor, promulgated by former US President Jimmy Carter, may be that of a mosaic, or a salad bowl, containing complementary but unamalgamated ingredients. Instead of seeking to make such differences disappear, the United States should instead make the most of them, recognizing the tremendous creativity and vitality they catalyze.

The composition of the US population is changing rapidly and significantly. By 2050, the percentage of Asians and Hispanics will both triple, and the black population will double; white Americans will no longer be in the majority. Garcia will replace Smith as the most common US surname [5]. What are today regarded as under-represented minorities will in some cases soon become well represented. In some arenas, underrepresented groups have already become "overrepresented." For example, students of Asian ancestry have found themselves at a competitive disadvantage in gaining admission to elite institutions of higher education and medical schools, because of their large numbers among qualified applicants. Similar situations are found in sectors such as entertainment and professional sports. As these examples demonstrate, proponents of diversity are circumspect about quotas, because they can cut both ways.

### **Serving Diverse Populations and Patients**

There are a number of ethical bases for arguing that the health professions, and in particular radiology, should increase the representation of certain population groups among their members. As noted, the patient population is rapidly changing, and there are many parts of the country, such as San Jose, San Antonio, and Miami, where former minorities are now in the majority. Although it is patently absurd to imply that patients should be cared for by physicians of their own race, there is certainly reason to hold that patients should be free to choose their physician. Shared race or ethnicity between patients and physicians has been shown to enhance communication, patient satisfaction, and compliance with medical recommendations, as well as overall health care outcomes [6–10].

We cannot judge the degree of "fit" between a patient and a physician based simply on race or ethnicity. Cultural competence is not something into which a physician is born, but rather is a skill set developed through education, travel, and work experience. Physician practices, hospitals, and other health care organizations strive for better understanding of the needs of the diverse populations they serve; one way of achieving that goal is to recruit and educate physicians from those populations.

## **Social Equity, Community Obligations, and Service Opportunity**

Most communities, including minority communities, have an aspiration that some of their own members will serve their health care needs. Many minority physicians feel an obligation to serve their community, perhaps accounting for the greater likelihood that underrepresented health care professionals will work in underserved populations [11,12]. Appendix includes definitions of communities who are underrepresented in medicine (URM). Communities assert that they have both a right and an obligation to be well represented in the ranks of health care professionals. Social justice and equity considerations also imply that underrepresentation in medicine is an unfair health care disparity, an inequality that should be mitigated by society at large. This rationale for affirmative action is predicated on equitable distribution of obligation, and opportunities for medical education and service, as well as on the concept of reversing past wrongs.

### **Affirmatively Redressing Past Wrongs**

Affirmative action, a term first introduced by President John Kennedy's executive orders, was intended to redress long-standing inequities, especially in educational opportunity, that were so deep and pervasive that only assertive enrollment of underrepresented minorities and women could reverse these historic imbalances [13]. Similar arguments are advanced in favor of affirmative treatment for individuals who come from disadvantaged backgrounds, such as poor and broken families.

Although successful in mitigating underrepresentation for several decades, affirmative action has been challenged in state legislatures, voter referenda, and federal courts. Although quota systems have appropriately been abandoned, medical educators have reframed the discussion in terms of health disparities in US local, cultural, socioeconomic, and national communities, and in terms of the educational, organizational, and operational benefits of diversity [13,14].

### **Special, Underserved, and Newly Insured Populations**

Through the past 4 decades, however, progress in diversifying medicine has been disappointing: there is a disconnect between vocal support and quantifiable results. The most pragmatic case for increasing URM representation may be the service commitment argument: minority physicians disproportionately serve underserved communities. Physician race and ethnicity are the strongest predictors that a physician will care for more-vulnerable and underserved communities; URM physicians that have the highest socioeconomic status serve at greater rates than do white doctors from the lowest socioeconomic status. With the aging US population, and more people insured after health reform, the most reliable and predictable way to provide expanded access for traditionally disadvantaged segments of the US population would be to expand representation of URMs in medicine [11,15,16].

### **Diversity As a Source of Innovation and Performance Improvement**

A final major line of argument for diversity derives from the importance of innovation and creativity. In general, homogeneous groups are at a competitive disadvantage compared with heterogeneous ones. Heterogeneous groups adopt multiple perspectives, affording a major advantage in approaching problems in a new way [17]. Such diversity in perspective may

originate from many sources, including gender, race, ethnicity, age, experience, and culture. For example, a radiologist might add substantially to the diversity of a group practice because of prior experience, such as having served in another part of the world as a Peace Corps volunteer, having had another career in a field such as business or the arts, or having dealt with the health care system as a patient. Just as diversity is important, so too is a variety of perspectives on the value of diversity.

## **THE CURRENT STATE OF DIVERSITY IN DIAGNOSTIC RADIOLOGY AND RADIATION ONCOLOGY**

The relative lack of diversity by sex, Hispanic ethnicity, and race in the RRO physician workforce has been documented and does not reflect the increasingly diverse US population [18,19]. Females and URMs are significantly underrepresented as residents, academic faculty, and practicing physicians compared to the US population and medical school graduates (Figure 1). Broadening diversity definitions with additional dimensions, such as sexual orientation, gender identification, religion, geography, age, disability, veteran status, and disadvantaged background, is increasingly accepted [20]. Limited data exist regarding representation of many of these groups in medicine; data collection initiatives are required, and some are underway [21].

### **Women in the House of Radiology**

Physician gender in diagnostic radiology has received increasing attention over the past few decades [22]. Women are underrepresented as practicing radiologists and residents [23,24], but are represented to a greater extent than men in academic radiology, [25] and certain subspecialties such as pediatric radiology and women's imaging [26]. Although it is the ninth largest Accreditation Council for Graduate Medical Education (ACGME) training specialty, in 2010, diagnostic radiology ranked 17th for representation of women among the 20 largest training programs [27]. Females are similarly underrepresented in the radiation oncology physician workforce, despite a history of prominent female physicians and scientists, including its matriarch, Marie Curie [28]. The underrepresentation also occurs in spite of prior acknowledgement of gender disparities in representation as practicing physicians [29], and more recently, increased primary and senior authorship among women in the medical literature [30]. Although increased proportions of female radiation oncology residents compared to practicing physicians and faculty demonstrate historical improvements, representation has increased only incrementally, averaging 0.3%/year over the past 20 years, presaging only continued subtle changes [31].

### **Underrepresented Minorities in the Radiological Professions**

Literature examining the racial and ethnic composition of diagnostic radiology [18,32] and radiation oncology [19,33,34] is scarce, but has documented underrepresentation across all practice levels. In diagnostic radiology, the number of URM residents significantly increased compared with the number of practicing physicians, suggesting historical improvements. However, this level remained unchanged over the prior 8 academic years through 2010. Diagnostic radiology ranks ninth in total resident enrollment among the 20 largest ACGME training programs. However, in terms of minority representation, radiology

ranks 16th for American Indian/Alaska native/Native Hawaiian/Pacific Islander (AI/AN/NH/PI), 18th for black, 19th for Hispanic, and 18th for all URM trainees (Figure 2). In radiation oncology, representation among residents has not increased significantly for any URM group since the data were first reported annually, and so URM radiation oncology resident representation is not different from that among practicing physicians.

### **Lesbian, Gay, Bisexual, and Transgender Diversity in Radiology**

The representation level of lesbian, gay, bisexual, transgender (LGBT) individuals within the US population and in medicine is unknown. The decennial US Census does not include questions on sexual orientation or gender identity; only the percentage of same-sex households, 0.95%, is assessed in the US Census Bureau 2010 American Community Survey [35]. Recent estimates are that 3.4%–3.8% of US adults identify as LGBT [36]. Whether LGBT individuals are disparately represented in medicine, RRO, or particular practice settings, is also unknown. GLMA (formerly the Gay and Lesbian Medical Association, which consists of health professionals advancing LGBT equality), the largest association of LGBT health care professionals, has an online membership directory with a few physicians listed for RRO [37].

## **LEVERAGING DIVERSITY AND ADVANCING INCLUSION: LESSONS FROM ENTERPRISES OUTSIDE RADIOLOGY**

How have institutions in private industry, small business, academia, and organized medicine addressed the issues and leveraged the opportunities presented by diversity and inclusion? The various ways that other organizations have approached and benefited from diversity and inclusion can be instructive for RRO.

### **Academic Medicine, Medical Education, and Organized Medicine**

Academic medicine has long supported expanding the diversity of the health care workforce. The Association of American Medical Colleges first acknowledged in about 1955 that “there is a problem” in the underrepresentation of blacks in medicine [39]. The association and the academic medicine community began studying and actively promoting enrollment of more diverse and representative medical students, noting in 1968 that “medical schools must admit increased numbers of students from geographical areas, economic backgrounds and ethnic groups that are now inadequately represented” [40]. As a result of this commitment of academic medical educators, the representation of African Americans in medical schools increased rapidly from 2.4% of all US students in 1968 to 6.3% by 1974 [41]. Representation has improved marginally since then, standing at 6.9% in 2012 [42].

Medical specialty societies have adopted policies or implemented task forces specifically to enhance diversity or reduce disparities related to their specialties, including the American College of Physicians [43], the American College of Surgeons [44,45], and the American Academy of Pediatrics [46]. The AMA has adopted numerous policies regarding gender minority patients and physicians, primarily around nondiscrimination, cultural competence, elimination of health disparities, and supportive environments for career and development of LGBT students and physicians [47].

## Health Services Delivery

As health care financing increasingly emphasizes population health, hospitals and health systems have realized the benefits of a more diverse leadership and workforce. Research on race, gender, and partnership in the patient-physician relationship demonstrated that improved cross-cultural communication and access to a diverse group of physicians leads to better health outcomes [7].

Saha et al confirmed the importance of racial and cultural factors in the patient-physician relationship. Governmental and educational policies that reduce the number of underrepresented minorities in the physician workforce may have a detrimental impact on health care delivery for minority populations, particularly for black and Hispanic Americans [10]. A recent report by the Institute of Medicine noted that gender identity–concordant physicians may provide better care for their LGBT patients, and it called for increased participation of sexual and gender minorities in clinical care and research [48].

The Health Resources and Services Administration confirmed that URM physicians disproportionately serve minority and medically underserved populations [49]. Minority patients tend to receive better interpersonal care from providers of concordant race or ethnicity [7,9,10]. Greater diversity in the health professions will likely lead to improved public health (for the entire population as well as minorities) by increasing access, service quality, cultural competence, and responsiveness [50].

## American and Global Industry

For several decades, corporate America has recognized the value of diversity and inclusiveness and has strategically exploited these factors to improve the economic performance of their enterprises. In particular, companies that serve the general consumer population directly, and operate in diverse or minority communities, have found it both necessary and profitable to embrace and reflect their ethnically diverse customer base by enlisting a diverse workforce. For example, the National Black McDonald's Owner Operators Association, founded in 1972, promoted not only inclusion of underrepresented minorities and women in franchise opportunities, but influenced the company to identify and recruit African American suppliers and employees as well. The current CEO of McDonald's Corporation is African American. Similarly, media giant Walt Disney Company boasts a diverse 10-member board of directors, including 4 women, 1 black, 1 Asian, and 1 Latino member. Its CEO is also the chair of its Executive Diversity Council, and executive compensation depends upon achievement of diversity goals.

A frequently cited example of a corporation exploiting diversity to strategic (read: profitable) advantage is the success of IBM, which has maintained a long history of progressive equal employment practices. Under the leadership of its CEO Leo Gerstner, IBM explicitly undertook a mission to appeal to a broader set of employees and customers. Over the 10 years following the start of this initiative, the number of IBM female executives increased by 370%, URM executives by 233%, and LGBT executives by 733%. It expanded its minority, small, and midsize business customer markets by exploiting the insights, efforts, and outreach of its 8 diversity task forces [51].

Sexual orientation is a dimension of diversity more recently affirmed by corporate America. However, as far back as 1995, Disney offered health benefits to employees' same-sex partners. It hired its first openly gay president in 2013 [52]. According to its CEO Robert Iger: "Diversity fuels creativity... we strive to reflect the diversity of the people [we] serve around the world ... . This diversity enables us to better serve our consumers and recognizes the magic in all of us" [53].

A seminal work in the popular business literature by Page demonstrates the value of diversity, specifically cognitive diversity, in improving problem solving and organizational performance. Based on rigorous studies of social psychology and mathematics, he demonstrates that diversity usually trumps ability when teams are confronted with unique problems or are offered novel opportunities. Groups that include people with a wide range of perspectives outperform groups of like-minded experts, especially when problems are difficult [17]. Pittinsky posits that active enthusiasm for those different from us improves organizations' effectiveness and service quality [54]. Texts such as these have entered the modern educational canon of American business schools.

Analysis of the corporate boards and top leadership of Fortune 500 and Global 1000 companies reveals an association among diversity, inclusion, business volume, profitability, return to equity, share price rises, and similar "bottom line" financial metrics. For example, companies with the highest representation of women in their top management teams achieve better return on equity and total return to shareholders [55]. Fortune 500 companies maintaining three or more women on their boards of directors earned an 85% greater return on sales and a 60% greater return on invested capital when compared with companies with no women directors [56].

Diversity programs may have unexpected salutary effects as well. For example, flexible scheduling (variable hours, telecommuting) are often introduced as policies more friendly to women. At IBM, employees with high-flexibility schedules worked 54 hours per week, as compared with 37 hours per week among employees with inflexible schedules [57]. Among US international trading partners, foreign corporations with greater female presence on their executive committees outperformed their competitors with no women, by a 41% greater return on equity, and 56% greater net earnings. Similar results have been documented by some observers regarding ethnic and racial diversity in a business workforce. The National Organizations Survey showed that greater racial diversity was associated with increased sales revenue, more customers, greater market share, and greater profits relative to competitors [58].

### **Beyond the "Business Case"**

However, not all studies have been confirmatory, and identification of direct causal relationships between ethnic and cultural diversity in corporate leadership and bottom line business performance has been elusive. Business research suggests that several conditions are necessary to manage diversity initiatives successfully and reap organizational benefits [59]. Diversity professionals increasingly recognize that diversity is a labor-market imperative as well as a societal expectation [60].



Corporate giants such as Xerox and IBM use diverse leadership to harness the diversity of ideas, perspectives, and heuristics that are intrinsic on boards composed of leaders from widely varying ethnic, cultural, and gender backgrounds. Of course, minorities remain profoundly under-represented at the apex of American business: of Fortune 500 companies CEOs, 1.2% are black, 1.6% are Asian, 1.6% are Latino, and 4.2% are women [61]. However, it is hard to overestimate the value of their atypical backgrounds in service to their enterprises when looking at the contributions of women and minorities such as Ursula Banks at Xerox, Sheryl Sandberg at Facebook, Cherry Murray at Harvard's School of Engineering, Shirley Ann Jackson at Rensselaer Polytechnic Institute, Wanda Austin at the Aerospace Corporation, Mary Barra at General Motors, Ken Chenault at American Express, or Susan Desmond-Hellman at the Gates Foundation.

## CONCLUSION

The business and social justice cases supporting diversity and inclusion have been built and supported by data in the 45 years since the passing of the Civil Rights Act. American and global businesses have found that diversity and inclusion are good for business, enhance their bottom lines, provide innovative perspectives, and improve customer service. Academic and organized medicine have adopted diversity as a core value, central to their missions of service. The ACR has taken a first such action step with the creation of the Commission for Women and General Diversity.

Training, recruitment, retention, promotion, and leadership development of radiologists from underrepresented groups are important to the well-being of our profession and the health of our patients. The ACR Commission for Women and General Diversity is committed to identifying barriers to a diverse physician workforce in RRO, and to offering policy recommendations to overcome these barriers in the future.

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## APPENDIX. Definitions of terms in modern diversity practice

### Definitions of Terms

The language used to categorize individuals is inevitably limited and occasionally unclear. For the purposes of this report, racial, ethnic, and sex groups are defined as consistent with the US Census Bureau [1,2]. Specifically, **racial groups** include: (1) white; (2) black or African American; (3) Asian or Asian American; and (4) Native Americans, American Indians, Alaska Natives, Native Hawaiians, and Pacific Islanders, grouped as one category AI/AN/NH/PI. Hispanic **ethnicity** includes those of Hispanic, Latino, or Spanish origin.

Prior to 2004, the AAMC used the term “**underrepresented minority**” to include blacks, Mexican-Americans, Native Americans (AI/AN/NH), and mainland Puerto Ricans. As of 2004, the AAMC adopted the term “**underrepresented in medicine**” to mean those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population. This current definition accommodates shifting demographics, focuses on representation, equity, and service, and supports data gathering in a range of ethnicities [3]. The acronym **URM** is used for both the pre- and post- 2004 definitions.

We acknowledge that a distinction is often made between sex (a “biological” definition) and gender (a “cultural” description) [4]. However, in order to maintain consistency with referenced literature and original data sources, **females** is used interchangeably with **women**, and **gender** interchangeably with **sex**. Sexual orientation and gender identity are grouped and discussed together as: lesbian, gay, bisexual, and transgender (**LGBT**). QIA

(queer, questioning, intersex, asexual, ally) groups associated with LGBT are not directly addressed in this report.

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## TAKE-HOME POINTS

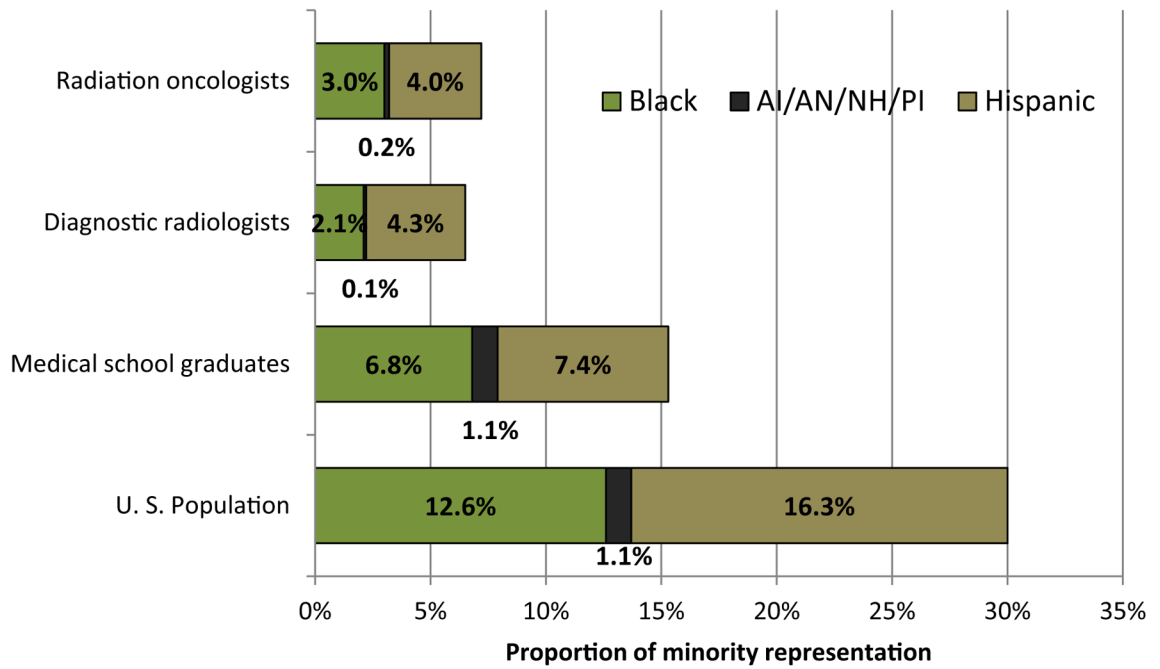
### Medical Education and Residency

- There is a specialty disparity in diversity: RRO training programs are less diverse than the pipeline of medical school graduates, and less diverse than other medical specialties.
- Strategic diversity leads to improved cognitive, educational, and social outcomes.
- Teams comprised of diverse viewpoints, perspectives, ideas, and backgrounds tend to outperform homogeneous ones.

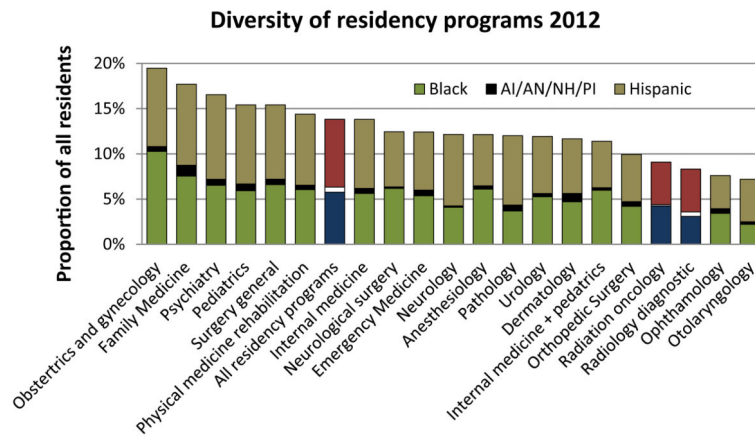
### The Business of Radiology

- A wider talent pool and ability to match patient and customer needs lead to improved service and better outcomes.
- Diversity better enables organizations to excel through innovation: a diverse set of experiences, perspectives, and backgrounds is crucial to the development of new ideas.
- Diversity that promotes cultural competence is the key to creating a positive experience for patients.
- Successful diversity and inclusion initiatives require commitment at the top of the organization, and accountability to and oversight by senior leadership.

**Relative diversity of practicing radiologists and pipeline populations**



**Fig 1.** Diversity of the U.S. population, medical school graduates, diagnostic radiologists, and radiation oncologists. Minorities underrepresented in medicine accounted for 15.3% of medical school graduates, but only 6.5% of diagnostic radiologists, and 7.2% of radiation oncologists [18–19]. AI = American Indian; AN = Alaskan native; NH = native Hawaiian; PI = Pacific Islander.



**Fig 2.** Diversity among residents in U.S. training programs in 2012. Most populous twenty specialties and an aggregate of all residency programs (13.8% URM) are shown. Radiation oncology (9.1% URM) and diagnostic radiology (8.3% URM) rank seventeenth and eighteenth in diversity [38].