

Improving Diversity, Inclusion, and Representation in Radiology and Radiation Oncology

Part 1: Why These Matter

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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.

Key Words: 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,

Credits awarded for this enduring activity are designated “SA-CME” by the American Board of Radiology (ABR) and qualify toward fulfilling requirements for Maintenance of Certification (MOC) Part II: Lifelong Learning and Self-assessment. [Click here](#) to access the associated SA-CME activity.

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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 underrepresented 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

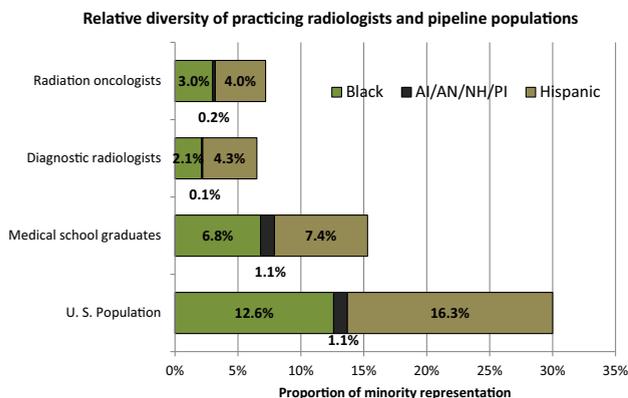


Fig 1. Diversity of the U.S. population, medical school graduates, diagnostic radiologists, and radiation oncologists. Minorities underrepresented in medicine accounted for 15.3% of medical school graduates, but only 6.5% of diagnostic radiologists, and 7.2% of radiation oncologists [18-19]. AI = American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

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

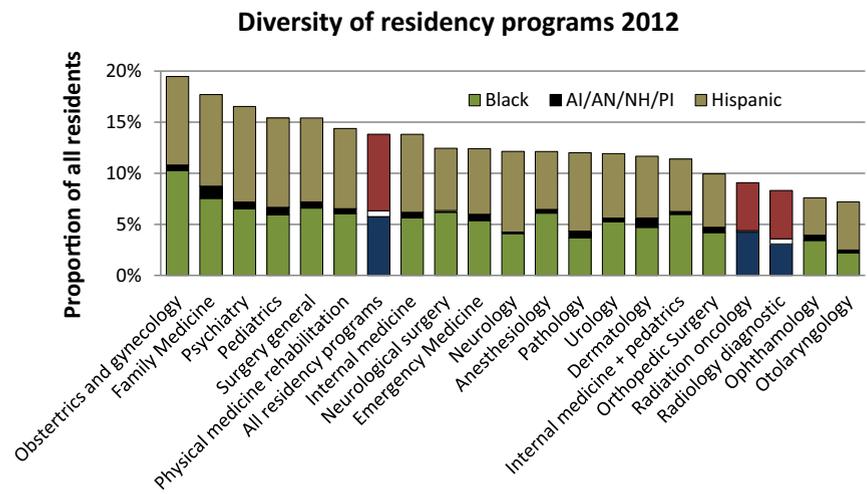
Academic medicine has long supported expanding the diversity of the health care workforce. The Association of American Medical Colleges first acknowledged in about 1955 that “there is a problem” in the underrepresentation of blacks in medicine [39]. The association and the academic medicine community 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].

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% URMs) are shown. Radiation oncology (9.1% URMs) and diagnostic radiology (8.3% URMs) rank seventeenth and eighteenth in diversity [38].



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]. Pitsinsky 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 underrepresented 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.

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.

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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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Credits awarded for this enduring activity are designated "SA-CME" by the American Board of Radiology (ABR) and qualify toward fulfilling requirements for Maintenance of Certification (MOC) Part II: Lifelong Learning and Self-assessment. Scan the QR code to access the SA-CME activity or visit <http://bit.ly/ACRSACME>.

Improving Diversity, Inclusion, and Representation in Radiology and Radiation Oncology

Part 2: Challenges and Recommendations

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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. Part 2 of a 2-part position article from the commission addresses issues regarding diversity and inclusion in the context of career choices and professional advancement. Barriers to improving diversity and representation in RRO are reviewed. Discussion focuses on the development and implementation of concrete strategies designed to eliminate the current subspecialty disparity and highlights the need for the ACR to introduce programs and incentives with targeted and achievable goals with measurable outcomes. Recommendations are made aimed at fostering an environment of inclusion and diversity, so as to secure a successful future for all members of the RRO workforce. The future of radiology will be enhanced by increasing diversity and representation in the professional workforce, which will allow us to better address the varied needs of increasingly diverse patient populations, and to mitigate disparities in healthcare access, delivery, and outcomes. By leveraging diverse backgrounds, experiences, and skills of those in RRO, we will create new, effective ways to not only educate our trainees, medical colleagues, and patients but also improve delivery of health care and our service to society.

Key Words: Diversity, underrepresented minorities, health disparities, health policy, radiology, radiation oncology

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Those who cannot remember the past are condemned to repeat it.

—George Santayana

INTRODUCTION

In this two-part position article from the ACR Commission for Women and General Diversity, we review the current status of diversity in radiology and radiation oncology (RRO) and highlight the challenges that minority groups face in their professional careers. Part 1 focused on the moral

imperative, public health, and business case to promote and leverage diversity [1]. Part 2 addresses career choices and professional advancement. Why are women and minorities underrepresented in RRO? What unique challenges do these historically disadvantaged groups face in contributing fully to our medical specialties? Our commission summarizes the challenges and opportunities for fuller participation particular to women and URM in radiology. Recommendations are provided, designed to foster an environment of

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diversity and inclusion, so as to secure a successful future for all members of the RRO workforce.

ISSUES REGARDING DIVERSITY AND INCLUSION IN CAREER CHOICES AND PROFESSIONAL ADVANCEMENT

Challenges Particular to Women in Radiology and Radiation Oncology

Unlike URM, women have entered and exited the medical school pipeline in increasing numbers and now comprise 50% of medical school classes (Figure 1). Previous studies and data from the Association of American Medical Colleges (AAMC) demonstrate that residency choices for both genders are the traditional high-patient contact fields of internal medicine, family practice, and for women, obstetrics and gynecology [2]. General surgery is an interesting anomaly, where female representation has steadily climbed during the past 5 years. These career choices are certainly reasonable and appropriate, as the medical system needs ever increasing numbers of physicians practicing in the outpatient arena.

More interesting are the reasons for disparate male and female representation in RRO residency programs. Baker et al found that the program director's gender did not affect female representation in diagnostic radiology residencies [3]. In 2 recent studies of medical students in radiology clerkships, no significant differences were identified between men and women in factors determining career choice, including competitiveness in

securing a residency position, role as a consultant physician, lack of mentors, and the technology-based nature of the specialty; flexible hours were not often cited as a motivator to consider diagnostic radiology [4,5]. The authors recommended early exposure using a required clerkship and increasing the availability of female mentors.

Medicine will undergo tumultuous changes during the next decade; predictions are for more radiologists and radiation oncologists as salaried employees, and decreased wages. This uncertainty, along with housing costs and accumulating debt, may lead students to consider shorter residencies. The median debt for graduating medical students is now \$175,000 [6]. Repayment may exceed \$400,000. For a 2-physician couple, the debt load may seem overwhelming.

Unique to women are pregnancy, postpartum recovery, and childcare challenges. The United States has no policy requiring adequate maternity and paternity leave or daycare facilities, and these rarely exist in medicine [7]. In most families, both parents work, yet women provide the greater share of childcare. Without a welcoming atmosphere allowing protected time off during the first year following childbirth, women finish training exhausted and seek careers with fewer demands on time. Once women complete RRO residencies, many enter academic practices. Female representation in academic medicine increased overall from 15% in 1970 to 35% [8], less than the expected 48%. Women and men are represented in equal numbers at the assistant professor level. Women do not rise through the ranks at the same pace as men, and many remain assistant professors for their entire careers. The percentage of female full professors in academic radiology departments is 18%, much less than the 26% in the fields of pediatrics and obstetrics and gynecology [8].

In a Masters of radiology panel discussion focusing on attracting female residents and promoting female leadership, several experts representing academic medical centers, private practice groups, and the military reported on their own experiences and those of their colleagues in promoting diversity [9]. Members of private practice groups focus on willingness to serve the group, including taking on positions beyond the standard workday such as clinical work on nights or weekends and service on hospital committees. Attendance at meetings held before or after standard working hours can be difficult for women responsible for childcare. Without additional participation in activities that benefit the group, women are considered to be second-class citizens. An exception is in the area of breast imaging, which is performed mostly by women [10,11] uniquely positioned in the field and closely allied with physician colleagues.

Women in the military and academia face the challenge of choosing a promotional track and adhering to its requirements. Mentors, male and female, are critical, especially during the early years of a career. Promotion

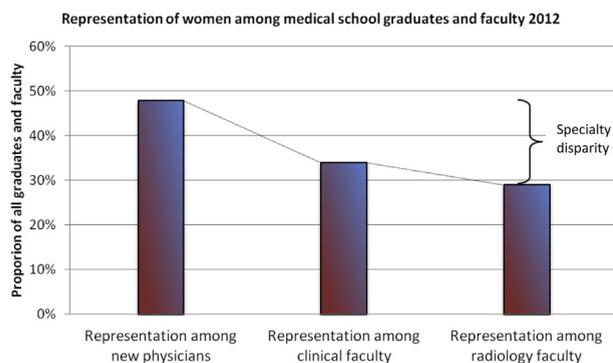


Fig 1. Women accounted for 48% of medical school graduates in 2012 [1], for 34% of all academic clinical faculty M.D.s, and for 29% of radiology faculty [2,3]. Women represent 51% of the U.S. population [4].

1. Association of American Medical Colleges. FACTS: applicants, matriculants, enrollment, graduates, MD/PhD, and residency applicants data. Available at: <http://www.aamc.com/data/facts/>. Accessed November 14, 2013.
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requirements, especially in increasingly popular and available clinician educator and clinical service tracks are often officially unclear. Mentors advise junior faculty on the importance of key activities, such as publication of teaching tools and development of new clinical service lines. They introduce young women to hospital leaders and important committee positions. Communication with physician leaders from other disciplines often serving on promotions committees is extremely important. A well-executed promotion application increases the stature of the female participant and her mentor.

Colleagues of either gender within and beyond the department are also critical for clear instructions on the soft skills required for promotion. Even in the most enlightened groups, discrimination by omission remains a problem. Women need to learn when and how to ask for positions of authority. Introverts may have an especially difficult time with negotiation, and the use of an executive coach may be helpful. Absence of national service remains a barrier to achievement in the academic realm. Although some recent efforts to include women in national and international societies have been successful, less than 20% of premier journal editorial board members are women [12]. This fact is discouraging, as many women senior reviewers are successful in obtaining promotions and serve as mentors to junior members of the faculty.

Advancement in the realms of academia and private practice requires hard work and sacrifice for both genders. Women in academia should understand that a career as an associate professor is a fine choice. Promotion to the highest realms of power requires change in work-life balance that some women may not be willing to make.

Challenges Particular to Underrepresented Minorities in Career Choice and Professional Advancement in Radiology and Radiation Oncology

Limited entry into the pipeline of URM undergraduate and medical students results in reduced downstream representation as residents, fellows, faculty, and practicing physicians. Even so, the lack of URM representation is even more pronounced in RRO relative to other medical specialties, as noted in Part 1. Thus, efforts to increase the numbers of URM medical students will not alone necessarily, automatically translate into increased representation within RRO (Figure 2). The reasons for the disparity between RRO and other specialties are unclear. Possible factors leading to an unaccessed but available stream of URM medical students have been organized into four overlapping themes: *exposure*, *interest*, *preparation/mentorship*, and *unconscious bias* [13,14].

Regarding initial *exposure*, blacks and Hispanics are less likely to attend medical schools with affiliated radiation oncology residency programs [14]. Additionally, RRO are generally offered as elective rotations, late in

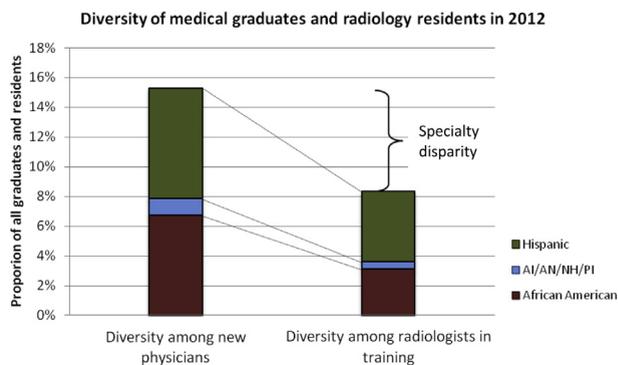


Fig 2. Underrepresented minorities accounted for 15.3% of medical graduates in 2012 [1], and 8.3% of diagnostic radiology residents [2]. URMs accounted for 31.5% of the U.S. population [3]. AI = American Indian; AN = Alaskan Native; NH = Native Hawaiian; PI = Pacific Islander.

1. Association of American Medical Colleges. FACTS: applicants, matriculants, enrollment, graduates, MD/PhD, and residency applicants data. Available at: <http://www.aamc.com/data/facts/>. Accessed November 14, 2013.
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the medical school curriculum. Efforts to provide early and focused exposure awareness of these fields have demonstrated variable though generally favorable efficacy [15,16]. Studying the effects of such exposure may yield insight into factors related to URM interest (or disinterest); once exposed, is there inherently less URM *interest* in the RRO field? The more technical aspects of the radiological sciences may present steep challenges, in view of known deficits in URM participation in the STEM (science, technology, engineering, and math) fields [17]. A perception that there is less patient contact in RRO may also lead to decreased URM medical student interest. Among reasons reported by URMs for selecting medicine as a career, blacks and Hispanics gave highest ratings to the following: patient contact, exercise of social responsibility, educating patients about health, and the opportunity to make a difference [18]. Emphasizing opportunities for patient contact and education may be used to attract both URMs to RRO.

For those candidates who do have an interest in RRO, are they adequately *prepared* and appropriately *mentored*? According to the 2010 program directors survey, the top two factors in ranking radiation oncology residency applicants were letters of recommendation and research, which are arguably related to exposure and mentorship. These factors were rated more highly than clerkship grades and the US Medical Licensing Examination Step 1 score [19]. Ensuring adequate research experience might begin to address this issue. However, there are no targeted mentorship programs for medical students or residents in radiology, and only a limited program in radiation oncology [20]. When women and URM

applicants do apply in RRO, they generally submit *fewer applications* than their male and non-URM counterparts, likely limiting their chance of matching [13,14]. Barriers to submitting more applications, such as cost, geography, and practice setting should be explored. Assessment of these sensitive and important issues requires adequate and deliberate mentorship and is likely hindered by a dearth of diverse, senior URM academic faculty and practicing physicians. Factors hindering URM representation among academic faculty, such as lower perceptions of network inclusion and experiences of racial or ethnic discrimination [21], must therefore similarly be addressed.

Finally, a recent study found that female laboratory manager position candidates were rated as less competent and less hireable than men with equal qualifications, and they were offered less career mentoring [22]. Similar results have been found for racial and ethnic minorities [23-25]. If equally qualified URMs are perceived to have less aptitude and so are selected less frequently for training positions, then such perceptions may ultimately limit educational and career opportunities. Future research should evaluate the ways in which both women and URMs are provided with opportunities and mentored throughout medical school and residency, particularly in less diverse fields such as RRO, to determine whether *unconscious bias* has an effect on specialty choice, residency selection and acceptance, and career advancement and progression.

Challenges Particular to Lesbian, Gay, Bisexual, and Transsexual Students and Physicians in Career Choice and Professional Advancement in Radiology and Radiation Oncology

Literature regarding lesbian, gay, bisexual, and transsexual (LGBT) issues in medicine generally concerns health disparities, such as the Institute of Medicine report assessing the state of science on the health status of LGBT populations [26]; efforts to integrate LGBT health in the medical student education curriculum, such as those by the AAMC [27]; and health policy and advocacy, such as that of the AMA Gay, Lesbian, Bisexual, and Transgender Advisory Committee [28]. A few LGBT radiologists have received visibility through the media: Dr. Alan Hart pioneered the use of x-ray photography in tuberculosis and was one of the first female-to-male transsexuals [29]; Dr. Danielle Kaufman, a board-certified radiologist and chief of nuclear medicine, wrote a book about her transition, *Untying the Knot: A Husband and Wife's Story of Coming Out Together* [30].

It is unknown if LGBT physicians are underrepresented in RRO or in particular practice settings (eg, rural versus urban, academic versus private practice) and therefore face unique barriers to entry and advancement. Limited literature emanating after the American Psychiatric Association's 1973 landmark decision to remove

homosexuality from the nomenclature of psychiatric disorders proposed that LGBT individuals might face personal questions when deciding to come out, as to whether it would influence their medical school grades, competitive residency selection, classmate support, ostracism, specialist referrals, and ability to practice in a small town [31]. Surveys confirmed these concerns [32,33]. LGBT physicians reported being refused privileges or denied promotion or employment based on their sexuality; being denied referrals; experiencing verbal harassment from their professional colleagues; being socially ostracized; overhearing colleagues disparage LGBT patients; witnessing substandard care or denial of care to LGBT patients; or being victims of overt gay bashing [34].

Although cultural climate and workplace hostility seem to have improved, and more recent survey data suggest a growing acceptance of LGBTs as physicians, issues nonetheless persist. In a 2005 survey, 95% of LGBT students applying for medical school did not disclose their sexuality for fear of discrimination, and 46% did not disclose when applying for a residency [35]. A 2010 AMA and Gay and Lesbian Medical Association survey of 427 LGBT physicians found continuing workplace harassment and discrimination [36]. They specifically reported being denied referrals (10%); harassment (15%); social ostracism (22%); overhearing derogatory comments about LGBT individuals (65%); witnessing discriminatory care of an LGBT patient (34%); disrespect toward an LGBT patient's partner (36%); and discriminatory treatment of an LGBT coworker (27%). Few had received any formal education on LGBT issues in medical school or residency [36]. It is likely that such manifestations of conscious (overt homophobia or heterosexism) or unconscious bias also permeate the RRO field. Further study is needed to understand how this bias may affect entrance into the field, specialization, career advancement, promotion, practice setting, and patient care. In the meantime, numerous resources are available to foster and promote a culture of inclusion [37-39].

STRATEGIES TO OVERCOME CURRENT BARRIERS

Women and underrepresented minorities face barriers and challenges limiting their full contribution to RRO. What strategies can the ACR undertake to make our specialties more diverse and representative? The ACR must take the lead in reducing the gap between the representation of women and URMs in RRO compared to other medical specialties. Addressing this "subspecialty disparity" will be a tangible demonstration of the organization's commitment to diversity as part of its core values and mission. The design and implementation of strategies to eliminate this disparity should be a central focus of ACR leadership as a targeted, achievable goal. Setting this agenda does not require solving the

Table 1. Values, manifestations, and organizational imperatives in Diversity 3.0: making diversity central to the mission

Values and imperatives in Diversity 3.0		
Equity	Diversity	Inclusion
Commitment	Visibility	Support
Hire differently	Manage differently	Promote differently

overarching problem of the limited stream of URM undergraduate students entering medicine. However, it *does* require that the organization address its own deficiency in the RRO pipeline. In doing so, the organization affirms its serious commitment to inclusion and diversity as prime objectives.

The ACR should model other medical specialties that have achieved a higher proportion of women and URMs in not only their fields, but among their leadership. The ACR should develop strategies to address the impediments specific to their exposure, recruitment, retention, and advancement of women and URMs, and set benchmarks and metrics to measure the success of its efforts. Each area should be examined in order to direct strategies toward the eradication of such impediments. For example, blacks and Hispanics have a greater likelihood of attending medical schools affiliated with historically black colleges and universities (HBCUs) which, though quite diverse in student composition, still educate a higher proportion of URM students than do majority medical schools. Typically, because these HBCUs lack RRO training programs [14], students are less likely to be exposed to RRO in clinical rotations or electives, or to radiologists or radiation oncologists as faculty and mentors. The ACR should explore ways it can promote accredited residency programs at these institutions, working collaboratively with organizations such as the ACGME and AAMC. Initiatives providing financial and mentoring assistance to increase the number of applications from women and URM students to residency programs could be easily implemented, and outcomes readily measured.

The ACR should develop mentoring initiatives for women and URM students, residents and fellows-in-training, academic faculty, and practicing physicians. As there is an absence of mentorship programs in diagnostic radiology, the ACR should be charged to fill this void. The diagnostic radiology community can take the lead from radiation oncology colleagues, who are far ahead in mentoring initiatives such as the ASTRO scholarship and awards programs [20]. The ACR could promote increased involvement in clinical radiology and in research via similar programs or externships. ACR's Radiology Leadership Institute could conduct executive coaching courses and training experiences for women and URM physicians to build skills to advance careers and facilitate leadership diversity. The ACR should incorporate these initiatives into programmatic objectives for the recently launched "Leading Radiology into the Future."

Table 2. Recommendations to the ACR: improving diversity, representation, and inclusion in radiology and radiation oncology for women and underrepresented minorities in medicine

Advocacy and awareness

- Raise awareness about the status of women and URMs through resources such as review and position papers, web-based resources, and sustained membership communication and dialogue.
- Develop national standards for valuing professional stewardship activities that women and URMs are likely to perform so that the full range and quantity of their service activities are factored into decisions about promotion and leadership (eg, women are more likely to volunteer to teach, URMs are more likely to serve in underrepresented communities).
- Develop metrics for monitoring and publicizing individual institutional and practice progress on professional diversity.
- Develop benchmarks for assessing institutional and practice performance on diversity and inclusion.
- Implement a reward system to highlight the accomplishments of radiation and radiation oncology practices that successfully achieve Diversity 3.0 and disseminate successes as models for diversification.

Professional opportunities

- Increase the visibility of accomplishments by women and URMs to ensure that their professional contributions receive recognition and open opportunities for advancement.
- Offer leadership positions to accomplished and able women and URMs.
- Create programs that directly engage and support women and URMs so that they can develop professionally.
- Develop incentive programs to attract minorities into radiation and radiation oncology as a medical career.
- Improve recruitment and retention of women and URMs.
- Expand initiatives to include diverse, excluded groups such as those who are lesbian, gay, bisexual, or transsexual; veterans; those who are disabled; and the socioeconomically disadvantaged.

Institutional performance and practices

- Develop leaders that value diversity; mandate cultural competence and a commitment to diversity.
- Require diverse search committees for new hires.
- Hold leadership accountable for the implementation of diversity and inclusion practices.
- Develop and maintain a system of accountability and responsibility that involves all departmental or practice members to ensure diversity and inclusion.
- Improve the work climate for women and URMs by implementing initiatives such as flexible work schedules, strengthening policies that support career-life balance, and embracing diversity among team members.
- Encourage institutions and practices to implement mentorship programs that specifically address barriers and inequities affecting women and URMs.
- Implement regular and transparent salary reviews; verify equal pay for equal work.
- Require that a 5-year review of the department or practice includes assessment of diversity and inclusion.

The ACR should explore active outreach to these populations of URM medical students to expose them to the specialties of RRO. Top motivators that attract these students to enter medicine include patient contact, social responsibility, patient education, and making a difference [18]. The ACR should educate URM medical students

regarding ways in which the RRO field meets their needs in these arenas, emphasizing the central roles our specialties play in delivery of patient-centered care, and opportunities for patient contact, especially in breast and women's imaging, interventional radiology, and radiation oncology. Our profession makes a difference by ensuring that patients receive high-quality appropriate care, and by protecting the public through radiation safety initiatives. This outreach can occur in collaboration with medical schools, the AAMC, and with established organized student medical associations, such as the Student National Medical Association or the Latino Medical Student Association. Ongoing study is warranted regarding the effect of unconscious bias on the perception of candidate abilities and aptitudes in the STEM fields, self-selection for STEM and RRO, recruitment into RRO residency programs, and impact on career outcomes.

RECOMMENDATIONS FOR THE HOUSE OF RADIOLOGY

Many past initiatives intended to improve diversity, inclusion, and representation in medicine have achieved limited and variable success [40]. Although minorities and women remain underrepresented as physicians and in leadership and faculty positions, recent gains are marginally encouraging [41]. Leaders in the House of Radiology now have an opportunity to learn from history, and to "get our house in order" by formulating effective and creative programs. Our recommendations are informed by past and future studies of diversity; the values, manifestations, and organizational imperatives of successful diversity initiatives appear in Table 1. Our vision for ACR is to achieve performance at the level of Diversity 3.0.

Our recommendations, detailed in Table 2, include initiatives in three major areas: advocacy and awareness; professional development support; and institutional performance improvement. By addressing the challenges to inclusion, representation, and diversity for women and URM in RRO, the ACR can help to reduce the disparity that exists within our specialty and to achieve workforce diversity in order to meet the future needs of all of our stakeholders, patients, and physicians alike.

CONCLUSION

The future of radiology will be enhanced by increasing diversity and representation in the professional workforce, which will allow us to address varied needs of diverse patient populations, and to mitigate disparities in healthcare access, delivery, and outcomes. By leveraging diverse backgrounds, experiences, and skills of radiologists and radiation oncologists, we will create new, effective ways to not only educate our trainees, medical colleagues, and patients but also improve delivery of health care and our service to society.

TAKE-HOME POINTS

- Responsibility for the success of each organization's diversity and inclusion efforts lies with top and senior management.
- Medical organizations such as the ACR must lead by placing diversity, representation, and inclusion into the central missions and core policies of our organizations.
- To date, progress has been made in gender representation and diversity, although career choice and advancement for women remain compromised.
- URMs are disproportionately underrepresented in RRO as compared with other medical specialties: the "specialty gap."
- There is a unique opportunity and achievable goal for RRO to eliminate this specialty disparity and to improve diversity even with the current supply of candidate trainees.
- Further efforts at making environments more inclusive, and to study the impediments to expanding the diversity of radiologists and radiation oncologists, are recommended.

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