Celebrating the Achievements of Women Radiologists and Physicians[1]

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When Herb Kressel, MD, became editor of *Radiology*, he asked me to write a series of Perspectives articles. Perspectives are viewpoints or overviews, are usually based on personal experiences, and often prophesy about the future. Ideally, they relate to a subject of broad importance or interest, are thought provoking, and are perhaps controversial. Surprisingly, or perhaps not so surprisingly, finding appropriate subject matter (1,2) has been more difficult than the writing.

This Perspectives article highlights and celebrates a major change in radiology during my career: the increased number of women radiologists in the United States. I believe this change is underappreciated by the radiology community for several reasons: Because attention has been primarily directed at the more global increase in the number of all women physicians (3–5), who during the 1990s constituted 50% of U.S. medical school graduates; because the percentage of women physicians in our specialty is smaller than that in most other medical specialties (6–15); and because major developments in radiology over the past decades have justifiably centered on new modalities, such as computed tomography and magnetic resonance imaging, rather than on who was interpreting these studies. Much has been written about sex reallocation and equality in the general workplace (16–19), but the extent and ramifications of these changes are nowhere more apparent than in medicine.

Some readers might find it presumptuous for a man to be writing on this topic, with women having authored many eloquent and informative treatises on the subject (20–23). Indeed, I am discomfited, and had I realized the extent of the literature on the subject of women in the workforce, in medicine, and in radiology, I would not have attempted to write this. However, my half century in medicine, including time as a residency director and frequent mentoring, has provided me with insight on the subject. And perhaps it is easier for a man to touch on, as I will do most gingerly, the controversial questions of hard-wired genetics, hormones, culture, and environment, to account for the real or perceived differences in abilities and aptitudes of women and men (24).

I recently visited the Italian city of Assisi, where St Francis spent most of his life in the early 13th century. Members of the Franciscan order he established were known for living among, and caring for and about, society's downtrodden, who were described in an historical account of that era as "the poor, women, and lepers" (unfortunately, having carefully written down this quote I have lost the reference). This snippet of history starkly contrasts with the rest of my Umbrian trip, where fortified walled cities, Roman ruins, monuments, and historic museum art were constant and harsh reminders of life in the male-dominated and frequently war-driven societies of the past two millennia. Fast-forward to the present, where most of the readers of this article, including myself, have been raised in relative comfort and never personally experienced war. This suggests to me that the evolutionary survival advantages of testosterone are on the wane in more civilized and peaceful societies. Indeed, it might be that the success of modern society relates more to men emulating women rather than vice versa (15).

I graduated from Swarthmore College in 1957 and from medical school at the University of Pennsylvania in 1961. This was followed by a residency in internal medicine and 3 years in the U.S. Army Medical Corps. Subsequently, I did a second residency in radiology at the Peter Bent Brigham Hospital, and I am currently a faculty member at Harvard University. When I entered the ranks

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of these institutions, none had ever had, or to my knowledge had ever seriously considered having, a woman president or leader. Now, with the exception of the Army, these institutions are all led by women, and Hillary Clinton came close to becoming Commander in Chief of the U.S. Armed Forces. My graduating medical school class of 1961 had eight women students among 128 students, and the preceding class had had three women students out of 130 students. Now the University of Pennsylvania has its second consecutive woman president. One of my previous women radiology residents is currently a medical school dean. Harvard Medical School (HMS) accepted its first female student in 1945, a decision made in part because the World War II draft had diminished the quantity and quality of male applicants. In 1969, only 9% of graduating medical students at HMS, and entering students at other U.S. medical schools, were women. Three decades later in 1998, women in the entering HMS class actually outnumbered their male colleagues. This is an amazing change to have occurred over these few generations.

By almost all metrics, including economic, the success of countries in the past half century has mirrored their integration of women into the workforce (13–16). This is particularly true in modern postindustrial white-collar–dominated economies, where more importance is placed on intellectual and communicative skills rather than physical strength. In 2010, for the first time, women in the U.S. were equally represented in the workforce and held a majority of managerial and professional jobs (albeit less so in the top ranks and not with equivalent pay [15]). U.S. women currently receive two-thirds of college degrees and 60% of postgraduate degrees, including half of those awarded in law and medicine. Men dominate in obtaining MBA degrees and in engineering and the "hard" sciences (15). There has been much conjecture about the reasons for these educational sex differences, including men having later maturity, higher rates of attention deficit disorder, and greater emphasis on sports. Whatever the reasons, it remains an open secret that many colleges currently practice "reverse" sex discrimination to achieve a more socially acceptable campus (25), a fact that has not escaped the attention of the U.S. Commission on Civil Rights (18,26). Currently at Harvard University, 60% of the nonfaculty workforce and 25% of the faculty are women. Unfortunately, in academic medicine, this failure to equalize hierarchical positions for women can no longer be attributed to simple pipeline projections (27).

Unfortunately, the penetration of women into the specialty of radiology has been less rapid than that into many other medical specialties (6–15). In 2009 and 2010, 46% of U.S. residents were women: Eighty percent of OB/GYN residents, 73% of pediatric residents, 56% of family medicine residents, 54% of pathology residents, 45% of internal medicine residents, 35% of general surgery residents, and 28% of diagnostic radiology residents were women (5). The reasons women medical school graduates choose radiology less frequently are not clear, are multifactorial (6–15), and certainly include concern about radiation during fluoroscopic procedures when possibly pregnant.

My mentor and predecessor as residency director, Morris Simon, MD, was an unabashed recruiter of women into radiology. Prior to the introduction of the residency match, he divided all ranked applications into piles of men and of women, alternately phoning and making offers to those on the tops of each stack. Although only one-third of the residents during most of our tenures as residency directors were women, women made up half of our chief residents. It was my personal observation that female residents more often had slightly better communicative, administrative, and social skills. They also had exceptional multitasking abilities, often running a household and raising children in addition to their residency duties. Of course, these are personal, anecdotal, and broad generalizations of a complex and sometimes contentious subject. Suffice it to say that there are relatively few scientific data (24) to suggest that the 1% difference in the genetic code between men and women relates to innate abilities and skills, other than secondary hormonally related behaviors (16,20).

One of the most widely held concerns regarding women physicians relates to disruptions caused by pregnancy and child rearing. Most chairmen and residency directors have heard, or perhaps initiated, complaints about women disrupting training programs and call schedules or believe that they exacerbated a perceived physician shortage by working part time or retiring early. Insofar as this is true, I believe it will occur less frequently in the future as there are more female physician role models and mentors. Additionally, stay-at-home dads, or partly stay-at-home dads, will presumably become more common and socially acceptable as more women physicians become the primary breadwinners. Recognition of this problem has prompted many institutions to offer campus child-care facilities and "mommy track" career paths, whose benefits include more flexible hours but which provide fewer opportunities for advancement or financial reward.

Women physicians have also been faulted for lacking the traditional physician's encompassing devotion to medicine. However, many observers welcome this change in life balance, a desire that appears to be shared by most younger physicians, regardless of sex. Although this is difficult to quantitate, women physicians are generally acknowledged to have more interest in the doctor-patient interaction and less emphasis on the financial rewards of the profession. If the relatively high financial remuneration of today's physicians diminishes, which I believe is probable and more likely in the higher-paid specialties like radiology, fewer men may choose to enter those fields. These financial considerations might help explain the overwhelming predominance of women in veterinary medicine, their relative prominence in countries with more socialized and less remunerative health care systems, and the relative popularity of MBAs among men. Of course, women may become more financially motivated if they are the major

family income producers: In 1970, U.S. women earned 2%–6% of family income, whereas today that number is 42% (18).

In conclusion, while I support the voices decrying the slow advance of women physicians in medicine, and particularly in radiology, I view the cup as half full and the rapidity of change, after centuries of the status quo, to be as remarkable as it is welcome. I personally believe these changes are happening in part because of distinctive abilities that women physicians bring to the table. However, that assumption is not based on science, and this article is not so much about why these changes are occurring as it is about the changes themselves and their impact on our profession and our specialty.

I close with the prediction that this success is going to extend beyond numeric parity and that in the future women physicians, and probably women radiologists, will surpass their male colleagues in both numbers and leadership positions, hopefully with a renewed humanization of the profession (21). That prophecy should not be entirely surprising because it has long been apparent in nursing and other nurturing components of health care. Women physicians should also benefit if health care delivery moves toward accountable care organizations, with their emphasis on the doctor-patient relationship and teamwork, a model that is exemplified in radiology by the subspecialty of breast imaging.

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