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MINISYMPOSIUM: DIVERSITY, EQUITY AND INCLUSION

Women in pediatric radiology: a call for gender equity

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Abstract
Pediatric radiology is the only specialty in radiology that is near evenly distributed among genders. Yet the top leadership positions in the field are still mostly occupied by men. In this article we review some of the history of women in pediatric radiology and discuss how to improve women's participation in the highest positions of our subspecialty.

Keywords Equity · Gender · Pediatric radiology · Radiology · Women · Workforce

The history of women in pediatric radiology

In 2018, a paper published in *RadioGraphics* detailed gender disparities in academics and radiology [1]. The paper discussed the percentage of women medical students (48%) compared to percentages of women radiology residents (27%), women practicing radiology (21%) and women leaders in radiology (13%). For the purpose of this paper, radiology leaders are defined as managing partners, chairs, vice chairs and executive committee members. Pediatric radiology has a better representation of women in its workforce, currently estimated to be 47% [2]. The Society for Pediatric Radiology (SPR) mirrors the makeup of its workforce and has 55% men and 45% women members. Yet, despite high numbers of women in our subspecialty, gender discrepancies persist in leadership and awards.

Since its inception in 1958, the SPR has had 11 women presidents, inclusive of 2022. The first woman who served as president was Dr. Marie A. Capitanio (1976–1977), just under 20 years after the first president of the Society, Dr. Edward B. Neuhauser (1958–1959). Dr. Capitanio studied as a fellow with Dr. John Caffey at the Children's Hospital in Pittsburgh and then moved to St. Christopher's Hospital for Children in Philadelphia, after being recruited by John Kirkpatrick. She had an illustrious career, working with Dr. Kirkpatrick, writing many landmark papers and exposing their institution to cross-sectional imaging. After Dr. Capitanio, the next woman elected SPR president was Dr. Beverly Wood, in 1987. Joanna Seibert in 1993, Diane Babcock in 1996 and Janet Strife in 2000 followed in subsequent years. Three women became presidents in consecutive years from 2006 to 2008 (Drs. Marilyn Goske, Marta Hernanz-Schulman and Maria Ines Boechat), followed by Dorothy Bulas in 2010. Since then, with the exception of Dr. Sue Kaste in 2012, no other woman was named president until 2022, with Dr. Cynthia Rigsby. To date, the overall percentage of women presidents for our Society is 17% (11/64).

Similarly, men have received more awards in our Society. For example, the SPR Gold Medal, which is the most distinguished award bestowed by our Society honoring a pediatric radiologist for his or her contributions as scientist, teacher, mentor and leader, has been awarded to 9 women and 46 men. The Pioneer award, which was initiated in 1990 and honors radiologists who significantly contributed to the early development of our Society, has been given to 5 women, in comparison to 33 men.

Yet, despite this gender imbalance, change is happening. For instance, among the 96 departments within the Society of Chiefs of Radiology at Children's Hospitals (SCORCH), there are currently 31 women pediatric radiology chairs. Additionally, approximately 50% of the subspecialty committees within the SPR are chaired by women. The hope is that this upward trend in women's leadership will continue. Historically speaking, women have been major innovators within the SPR. Among the many giants in the field, Dr.

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Goske spearheaded Image Gently, working tirelessly to increase awareness about CT radiation dosing in pediatrics through a national education and awareness program. This program has encouraged radiologists to pay attention to radiation doses for exams, whether pediatric or adult, and changed the way we image our patients. Another pioneer, Dr. Boechat, founded the World Federation of Pediatric Imaging. Because of this initiative, the pediatric radiology specialty has provided worldwide education to improve children's care across the globe. These two women advocates in pediatric radiology exemplify how gender representation can foster success and is a key factor for the continued success and innovations of our field.

In the overall field of medicine, change is also happening, with the level of involvement and opportunities for women being better than ever. In 1970, approximately 10% of each medical school class was composed of women. This percentage has been increasing, with women making up approximately 50% of medical school classes in 2016 [3]. However, the gender disparity at the leadership level in medicine remains striking: in 2014, only 21% of women reached the rank of full professor and only 16% of deans of medical schools were women [4]. Focusing on academic radiology, a review of 58 major academic radiology departments corresponding to the top 50 medical schools in the United States revealed that 9% of chair positions were held by women and 25% of secondary leadership positions (section heads or vice chairs) were held by women in 2016 [5].

In a 2016 survey of 5,089 academic radiologists, of whom 71.5% were men and 28.5% women, 16.5% of the women attained full professorship while 26.1% of the men reached the same rank. When considering the initial pool of 5,089 surveyed radiologists, 239 women, or 5% of the total pool of participants, became full professors, and 948 men, or 19% of the initial pool, became full professors. Interestingly, the authors concluded that, after adjusting for age, years in residency, research productivity, medical school ranking, National Institutes of Health (NIH) grants, clinical trial involvement and Medicare payments, that there was no difference in faculty rank between men and women. Yet, in their discussions, the authors acknowledged that this inference did not take into consideration clear historical gender inequalities in childcare and household responsibilities, which can markedly delay academic endeavors, including research publications, academic talks and grant acquisitions, all important determinants for promotion [6]. Men also outnumbered women in membership of radiology societies (67% men vs. 33% women) and their leadership positions (71% men vs. 29% women) in a survey of 2,825 radiology society committee members in 2021 [7]. As of this year, only five women have been president of the American College of Radiology (ACR), with the first African-American woman (Dr. Beverly Coleman) elected in 2021.

When evaluating research grant funding, which some would deem as a pillar of academic achievement, the percentage of NIH grants awarded to women during 2016–2019 for diagnostic radiology research was 39%, improved from 2015, when women received 16% of all NIH awards and 13% of funding or total money granted [8, 9]. Women's authorship of radiology journal articles has also trended upward, with women first authors rising from 8% in 1978 to 32% in 2013 and women senior authors increasing from 7% in 1978 to 22% in 2013 [10]. However, the coronavirus disease 2019 (COVID-19) pandemic has negatively impacted this trend. Early studies have shown that during the time of the COVID-19 pandemic, women have had a significant decrease in first or corresponding author article submissions, participated in fewer peer-review assignments and attended fewer funding-panel meetings, whereas men's equivalent metrics have remained unchanged from pre-pandemic times [11, 12].

Trends of women's leadership as well as academic presence and advancement in pediatric radiology are similar to those seen in academic medicine and radiology. SPR has nearly equal male and female representation in its membership, which reflects the overall workforce [13]. Yet only 28% of full professors in pediatric radiology are women [2]. Of note, among the pediatric radiology departments of the four largest children's hospitals in the United States, as of this writing, only one was chaired by a woman (Dr. Jeanne Chow, interim chair of Radiology, Boston Children's Hospital). Academic gender disparities are also apparent at the annual SPR meetings. For instance, a review of the 2018 annual SPR meeting showed that 50% of the oral scientific presentations were delivered by women and 38% of the postgraduate talks were delivered by women. Interestingly, in the first process, oral scientific presenters are selected blinded to the authors' names, whereas in the second process postgraduate presenters are chosen based on who the selection committee proposes as speakers [13].

Although the gender disparities in academic medicine, radiology and pediatric radiology have been improving over time, there is still a large gap that needs to be overcome. What is holding women back?

Gender fatigue

To address the gap, it is important that we acknowledge and discuss the gender disparity issue. This entails fighting against the concept of "gender fatigue," or the idea that gender inequality happens *elsewhere* but not in our own workplace [14]. Gender fatigue originates from the thinking that gender inequality is no longer an issue ("things have been improving markedly in the last 50 years") and that gender inequality does not exist because many women are now offered positions of leadership. An example of this last

point is a recent encounter, when the chair of a department announced that his department was a model of gender representation because > 60% of leadership positions were held by women, failing to mention that at the top-tier leadership positions (the ones in control of most departmental decisions) were only held by men (personal communication).

The second shift

Perhaps one of the most important elements in any successful academic career is time. Time is needed for conducting research, which includes producing publications and applying for and attaining grant funding. For many, this time usually comes after regular work hours. Studies have shown that women are more likely than men to be the primary caregiver at home; therefore, when women leave work, they usually go home to start their *second shift* or *unpaid labor*, i.e. the job of managing a home and family. While this second shift is less unbalanced than it was 50 years ago, the truth is that it is still unequal: a pre-COVID-19 pandemic study showed that while men have more than tripled their contributions in the household since 1970, their share of unpaid work is still *half* that of women's [15]. The COVID-19 pandemic brought these differences acutely to the forefront and further threatened women's careers. In the month of September 2020 alone, 865,000 women left the U.S. workforce, compared to 216,000 men [16]. In radiology, women have struggled to juggle work-related duties, including academic work such as research and administrative duties, while managing non-work-related duties including childcare and household maintenance. This has been compounded by new responsibilities caused by the COVID-19 pandemic, such as overseeing distance learning for children and ensuring safety of household members who might be at high risk for COVID-19-related complications. These factors contribute to psychological distress and delay in academic advancement, and ultimately play a role in burnout and diminished personal wellness. In fact, in a recent survey measuring the level of anxiety reported during the COVID-19 epidemic in physicians who are mothers, 41% of the participants scored as dealing with moderate to severe anxiety, in comparison to normal circumstances when about 19% of adults have had any anxiety disorder in the last year [17].

What are potential solutions? One is outsourcing. If one is financially capable, it can be helpful to look for ways to alleviate responsibility. For instance, an important bit of advice from one mentor was that she made ordering food a common occurrence in her household because she would rather have the time typically spent on cooking, shopping and cleaning to be with her children (personal communication). Other ways this can be done are by outsourcing the shopping, cleaning of the home, and certain aspects of childcare if it is financially feasible. Another key component in dealing with the juggling act is to have support from one's partner. It is especially important to communicate with and engage one's partner to ensure both are not striving for equality, but for equity.

The question of maternity

Consider this real-life encounter: a young female physician becomes pregnant during her internship and discloses this to the *female supervising physician* of the internship, who responds to her: "You realize we have a problem, right?" There is never a perfect time to have a baby during one's career, but prime times for women physicians include the years of medical school to early or mid-career. Cleary delineated, equitable and openly enforced guidelines for parental leave are necessary in order to decrease the angst women feel when trying to tell the leadership they will need time off. Similarly, protected time for breastfeeding is essential, without penalties or fear of what others think. This is critical to ensure that women are included in the workplace, and ultimately to contribute to job satisfaction and workplace happiness. In fact, research shows that paid leave policy is not an economic drain; instead, it saves the company money in the long run, reducing turnover and increasing productivity, morale and retention of personnel, all crucial components of a stable work environment [18, 19].

Effective mentoring

An effective mentor can inspire, elevate and contribute in many ways to a woman's career. A mentor can provide continuous encouragement and the opportunities to develop and amplify critical scientific thinking. They can answer questions at crossroads and inspire their mentees to follow paths they never thought to take. Those with effective mentors report a greater number of publications, higher likelihood of being awarded grant funding and increased opportunities for promotion [20]. An effective mentor can also help in introducing the mentee to speaking engagement opportunities. Speaking engagement invitations result in increased national visibility, leading to more opportunities and the possibility of future collaborations. Department leadership has a crucial role in this field [20]. Department leaders can foster work relationships among the faculty members and help create a vision for a person's career, one that respects the wishes and desires of the mentees and their personal academic trajectory.

Social media have had a tremendous influence in this effort. The emergence of multiple platforms such as

Facebook and Twitter has connected people across different specialties and backgrounds to support one another. One example includes an ad hoc group of women pediatric radiologists who came together to talk about work situations and eventually became a scaffolding for one another, developing a safe forum to discuss their academic and career goals as well as obstacles to goals. This has created a powerful forum to discuss life situations and share experiences and ideas (personal communication). Accessing this community of support via social media can give a feeling of empowerment [21]. Another example of social media's positive role is the development of a Facebook group called "Radiology Chicks," composed and designed by women radiologists. This group has created innumerable opportunities for bonding and produced an exchange of information among women radiologists, a virtual place where women find a kinship with other women radiologists who become part career counselors and part cheerleaders.

Salary inequities

Overall, women in academic medicine are paid less than their male peers, even when considering same rank and promotion. In a study of 559 department chairs across public schools of medicine, where 17% were women, after adjusting for term length, specialty, title and regional cost-of-living differences, the salary difference was $67,517 in favor of the male chair; in those who had served for more than 10 years, the difference rose to $127,411 [21]. The 2018 Doximity Physician Compensation Report found that radiology had the fourth-highest wage gap between men and women, with women's salaries 21% below men's. This pay gap widens for women who are from underrepresented minorities, are recent immigrants or have differing physical abilities [21].

A number of factors can contribute to pay discrepancies. Women might cut their hours after having children, and women tend to not self-promote or negotiate salary. In a real-life example of this, a young pediatric radiologist realized that her starting contract was $17,000 lower than that of a male colleague, although she was a year senior to him; the male colleague had negotiated his contract with the chair, whereas the female radiologist accepted the contract without negotiation (personal communication).

According to the Harvard Business Review, approximately 20% of women do not negotiate their contract upon graduation. The real fear of being disliked, of being perceived as aggressive, or of being rejected for the job keeps women behind their male counterparts in the negotiating perspective. This can result in serious disparities in long-term salary differences, one partially to blame on the system and the lack of women negotiating and asking for higher pay. Consider this example: two equally qualified candidates, a man and a woman, receive job offers for $25,000/year. The man negotiates the offer at the start and receives $30,000, whereas the woman does not negotiate for fear of being disliked and appearing aggressive. Both receive a 3% raise every year for cost of living. By the time they reach age 60, the salary disparity will be about $15,000/year, with the man earning $92,234 and the woman $76,870, which results in an overall extra earning of $361,171 over the course of 38 years of work. Say that the man had simply banked the difference without investing it, just getting minimal return of 3%, the total extra gain that that man gets over the woman by age 60 would be $568,834. All because the woman did not negotiate a $5,000 increase at the very beginning of the contract [22].

Transparency in salaries is also important. In Iceland, the Pay Equity Law was passed in 2018, a year after women candidates won nearly half of Iceland's parliamentary seats. This law imposes a system in which each company needs to show equal pay for the same positions regardless of gender, in order to receive certification. As of 2020, certifications became a requirement without which companies might incur a daily fine. This measurement has increased accountability and transparency in the compensation system.

In the United States, California recently passed a law requiring employers to file equal pay reports annually. Colorado and a dozen other states have passed or are considering a variety of pay transparency bills. The best way for leaders to ensure their employees are paid fairly is with a pay equity audit, or PEA. This involves comparing employees doing "like for like" (work experience, credentials, nighthawk or moonlighting shifts, etc.), and investigating the causes of any pay difference. Lack of transparency might lead workers to take action. At Google, 1,200 employees (2% of the Google workforce) shared their salaries among themselves, which revealed that in 2017, men were paid more than women at most job levels [23].

After-hours expectations

Today, the definition of family is dynamic and fluid. Previously, a family typically consisted of two parents, one of whom might not be working outside the home and who served as the primary caretaker at home. However, today there are many definitions of family, including single parenting. Therefore, one cannot assume that one's colleague has a partner at home caring for the children. It is important that we be cognizant of colleagues' personal responsibilities outside of work and to work together to accommodate one another. For instance, if a coworker takes care of the children by himself or herself and must leave at the end of the workday promptly, it is important to create an environment that accommodates this with understanding leadership and colleagues. One other important factor is minimizing or eliminating work-related duties, such as meetings, during

evenings and weekends. Consider this example: a female radiologist who has teenage children at home is at a work dinner. When she gets up to leave, a senior radiologist says to her "you should not go, your children are old enough and can take care of themselves." This type of comment insinuates that if the female radiologist leaves the dinner, there might be repercussions. This potential pressure from seniors and leadership is not conducive to wellbeing. When leaders model that working after hours is acceptable, they are sending a clear message of what they expect. In contrast, by emphasizing prioritization of personal time, such as with family, leadership can create an atmosphere of wellbeing and family preferences in the workplace. An example is the male chief orthopedic surgeon of a large pediatric hospital, discussing his leadership style at a leadership conference: his surgery staff knew that he needed to be home in time for baseball practice for each and every one of his children; as such, his surgical schedule was designed around this time constraints. He was always home for dinner with the family. This sets the tone of what is expected and valued in his department.

Potential solutions

Address bias and create a safe, inclusive, supportive work environment

Leadership of a department should openly and transparently discuss diversity and gender gaps in the department. Similarly, salaries should be as transparent as possible. Fostering a more open and transparent environment encourages leaders and staff to have these difficult conversations, thereby minimizing the perpetuated stigma associated with salary discrepancies and inequities. In addition, the workspace should provide equal mentorship opportunities for women and men for academic and research growth. This might be challenging in departments/institutions with a smaller cohort of women, and therefore a smaller pool of women leaders. Therefore, reaching across subspecialties and institutions to provide this for women is crucial.

Prioritize recruiting and retaining diverse staff

There are numerous benefits to hiring a diverse staff, including [24]: (a) better access to talent by accessing a pool of women and other underrepresented minorities; (b) improved engagement and retention: lack of women in positions of leadership and power leaves early career women and minorities without mentors or figures to emulate, whereas the reverse demonstrates that having the grit to navigate the field can give anyone the opportunity to achieve positions of leadership, if so desired; (c) a feedback loop for long-term gender parity from the increased hiring, representation and retention of women, which in turn encourages other women to stay at their current job, thereby increasing female representation in the workforce.

Change the rate of turnover — a call for term limits in leadership roles

Beeler et al. [25] studied the rate of chair turnover in medical schools in the United States. Given the low rate of female radiologist department chairs, it would take decades for gender equality in the department if male chairs remained until retirement. As of 2019, of the 2,145 clinical department chairs serving at U.S. medical schools, 505 had served terms longer than 12 years, one of whom had served as long as 43 years [25]. Of these 505, 7% were women and 10% were minorities. This results in a stagnant leadership model in which one person's perspective holds disproportionate influence for a long period of time. Given the large proportion of men in chair positions, this model would make the gender disparity prolonged for decades to come. Beeler et al. proposed enacting term limits in these academic positions, thus increasing diversity, equity and inclusion within academic medicine.

Engage men in advocating and promoting gender equity

Given that men are leaders of 82% of all firms globally, without engaging them, diversity and inclusion efforts will fall short. Because leadership positions are primarily held by men, in the past, men were often equated with excellence, and some fear that diversity would sacrifice quality. These predisposed notions must be changed. In fact, research shows that organizations that are equitable are more successful, profitable and innovative, benefiting all employees, regardless of gender. Therefore, it is crucial that men and women work together to change these limiting thoughts. It is only through "we too," or working together, that the "we" in medicine and in our community of pediatric radiologists can be truly inclusive of all.

Conclusion

In this paper we have examined the history of women in pediatric radiology. Many positive strides have occurred, and as such, our daughters will inherit a much more fair and equitable society than our mothers did. It is important to underscore that the buy-in of men in this effort is critical as we strive to make the Society for Pediatric Radiology, and our profession, the one to show society that equity is indeed possible.

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Declarations

Conflicts of interest None

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