Women in neurosurgery: inequality redux

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In April 2018, Dr. Shelly Timmons assumed the mantle of President of the American Association of Neurological Surgeons (AANS) (Fig. 1). It is worth taking this moment to reflect on the fact that this is the first time in its 86-year history that the AANS is being led by a female neurosurgeon. Trumpeting this accomplishment nationally provides an extraordinary opportunity to engage the attention and imagination of female students, trainees, and neurosurgeons around the US and the world, and to send a clear message to our neurosurgical and non-neurosurgical colleagues, including those who populate key roles on university search committees and in hospital administration, that women are valued in neurosurgery.

This singular accomplishment by Dr. Timmons allows us to reflect not only on the status of women in neurosurgery but also on the status of women in the workforce in general, a topic that has been informed by several recent publications and op-eds on gender disparity in society. Across all professions, disciplines, and career paths, women are underrepresented at virtually every level in corporate America.1 This inequality has been shown to start as early as the time of first promotion, and it becomes progressively more manifest at subsequent levels of career advancement. Women are far less represented in higher levels of corporate management. When compared with their male counterparts, women far less frequently occupy “C-suite” positions (i.e., chief executive officers, chief operating officers, and chief financial officers). Worse, a gender pay gap exists across nearly all disciplines, with women receiving 20% less compensation than men in the same positions or for performing the same amount of work as men (https://leanin.org/equal-pay-data-about-the-gender-pay-gap). These facts, coupled with recent attention focused on the #MeToo social media movement against sexual harassment and assault, especially in the workplace, make this an opportune time to review ways in which organized neurosurgery has responded to issues of gender disparity and diversity, and to offer possible solutions to improve career opportunities for women in neurosurgery in the future.

A dozen years ago, a light was shone on the issue of gender inequality in neurosurgery through the publication of two reports.14,16 In one, Venes drew attention to the facts, still true today, that female neurosurgeons are paid less than male neurosurgeons when working in similar jobs, and that adequate mentorship of female neurosurgeons is lacking.14 Venes argued that women may be held to a higher standard than men in becoming leaders in the field of neurosurgery, hence the conspicuous absence of female neurosurgeon leaders at the state or national level. One solution to this inequity was to encourage more female neurosurgeons to complete nationwide leadership programs, such as the Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program for Women.

In the other report in 2006, Woodrow et al. performed a critical analysis of the neurosurgical workforce in North America, concentrating on gender issues.16 At that time, an estimated 13% of practicing surgeons and 6% of neurosurgeons in North America were women, with the number of female neurosurgical residents totaling approximately 12%. Numerous factors were identified that were causally related to this gender inequality in neurosurgery, including the inflexible work environment of neurosurgical practices, unconscious bias and harassment, increased home and family responsibilities, and the lack of adequate mentoring and role models. As potential solutions, these authors suggested that a concerted effort to attract more female neurosurgeons in the early years of medical school, job sharing paradigms, consistent parental leave policies, on-site day care facilities, and meaningful mentorship programs for women in neurosurgery would all serve to reduce gender inequality in neurosurgery.16
Following the publication of these two papers, the AANS commissioned a white paper from the Women in Neurosurgery (WINS) Committee of the AANS on the topic of recruitment and retention of women in neurosurgery. Benzil et al. published their findings in this Journal in 2008, noting that at that time, there had never been a female President or Executive Committee officer of the AANS; there had never been a woman appointed to the Board of Directors of the American Board of Neurological Surgery (ABNS); there were only two female members of the Society of Neurological Surgeons (SNS); there was only one female neurosurgery departmental chair (at the University of Michigan since 2005); and there were four neurosurgery training programs in the US that had never trained a female resident.3 The white paper underscored the reality that women were rarely groomed to become leaders within or chairs of their neurosurgical departments and were concerned about gender inequality in salaries, academic promotion, and achieving leadership positions. As potential solutions to the gender imbalance in neurosurgery, Benzil and colleagues called for a zero tolerance policy on sexual harassment, the creation of workshops on negotiating skills for academic or hospital contracts, and a redesign of the medical student curriculum to more vigorously attract prospective female neurosurgical trainees and to promulgate the importance of diversity at all levels of neurosurgery training, practice, and leadership.3

In response to the publication of the white paper in the pages of this Journal, Dr. James Bean penned an editorial about women in neurosurgery. In his editorial, Dr. Bean reflected on the moral and political principles of equality on which our nation was founded, and on how progress toward realizing this goal of equality had been “halting and uneven and marred by…hope disappointed, and promise denied.”2 The white paper charged organized neurosurgery with a call-to-action to attain a 20% female complement within residency training programs by 2020 and a 20% female faculty complement by 2020.3

A glimmer of hope was found with the analysis of neurosurgery enrollment and attrition within the 2000–2009 female resident cohort that matched to neurosurgical training programs when compared to the prior epoch of 1990–1999.11 Over these two epochs, attrition of female neurosurgery residents had declined from 25% to 17%. The success in attracting and retaining female neurosurgical trainees was thought to be directly attributable to efforts by WINS at codifying its mentorship program and providing more than 250 pairings since 2010 between female or male mentors and aspiring female neurosurgeons.

A decade has now passed since the publication of the WINS white paper in the Journal. How does the scorecard for organized neurosurgery look? After analyzing the results of 18 annual neurosurgery residency match cycles in the US, Durham and colleagues showed that United States Medical Licensing Examination (USMLE) Step 1 score was the greatest predictor of successfully matching in a neurosurgery residency program, with the national ranking of an applicant’s medical school also significantly associated with match outcome.4 Interestingly, after adjusting for applicant USMLE Step 1 scores and medical school national rank, female neurosurgery residency applicants still “appeared to be less likely to match into neurosurgery [training programs] than male applicants.”4

Furthermore, with women still representing only 6% of ABNS-certified practicing neurosurgeons, 8% of all practicing neurosurgeons in the US, and fewer than 20% of the applicants to neurosurgery training programs, the gender trends for neurosurgery are at odds with trends for medical school attendees. In 2017, for the first time, the number of women enrolling in US medical schools exceeded the number of men, with women now representing 51% of matriculating medical students.8 So why, then, does gender parity in neurosurgery seem so remote a goal?

The rigors of a neurological profession certainly pose a deterrent to some medical students—of either gender—as they consider career paths, and should raise questions about work-life balance for anyone contemplating this profession, as articulated in a recent perspective in The Lancet by a first year neurosurgery resident.27 However, examples exist of demanding professions in which women have made far greater inroads with respect to leadership positions than in neurosurgery. For instance, in 2017, women held 20.2% of board seats, and accounted for 5.4% chief executive officers of Fortune 500 companies and 19.4% of the US House of Representatives.5 Women remain underrepresented in academic medicine, as a whole, however,