

# Understanding and addressing gender equity for women in neurology

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## Abstract

Despite the fact that the percentages of women among physicians and neurologists have been rising, gender-related disparities in numerous metrics persist, notably in compensation, promotion, funding, recognition, leadership, publishing, and speaking. Simultaneously, women working in academia, including medicine, face high rates of sexual harassment. Leaders of all health care-related organizations must accept the moral and ethical imperative to expeditiously address both gender-related discrimination and harassment (inclusive of but not limited to sexual harassment) of women in medicine. At this unique time in history, there is an opportunity for leaders in neurology to strategically accelerate efforts to address workforce gender disparities and ensure harassment-free training and work environments. Leaders will have to plan an intentional path forward, using a systematic process, metrics, and strategies unique to their own organizations, to overcome barriers to an equitable and safe work environment for women. Moreover, leaders in 4 gatekeeper organizations—medical schools/academic medical centers, funding agencies, journals, and medical societies—must hold each other accountable for gender equity as their own success and financial return on investment is dependent on the efforts of those in the other categories. In short, the path forward is to focus on ethical principles and behavior when it comes to addressing workforce gender disparities for women in medicine.

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## Glossary

AAN = American Academy of Neurology; CV = curriculum vitae; NASEM = National Academies of Science, Engineering and Medicine; ROI = return on investment.

A landmark moment occurred in 2017, when for the first time women accounted for more than half (50.7%) of incoming US medical students.<sup>1</sup> One might think then that medicine, with its large proportion of intelligent and highly trained women physicians and scientists, is leading the way in gender equity. Yet it is not. In fact, in many cases research shows slow progress,<sup>2</sup> no progress,<sup>3</sup> or even regression<sup>4,5</sup> in workforce gender equity. A robust evidence base, primarily reflecting that most gender equity research occurs in academic medicine, demonstrates disparities for women in compensation,<sup>6</sup> promotion,<sup>7</sup> research funding,<sup>8</sup> recognition awards,<sup>4,9–11</sup> journal editorial board representation,<sup>5,12</sup> publishing,<sup>13,14</sup> speaking,<sup>15–17</sup> workplace environments,<sup>18</sup> and recruitment/retention offers.<sup>18</sup> Disparities in promotion start early in women's careers and the gaps become more pronounced over time. For example, women account for 47.4% of assistant professors (1,308 of 2,760), 38.5% of associate professors (474 of 1,231), and 20.8% of professors (297 of 1,429) in neurology.<sup>19</sup> Although the greatest disparities for women in the academic track occur at the professor level, including in neurology,<sup>20</sup> Schor<sup>21</sup> found that among senior level leadership, only 15% of US medical school deans were women. Even in surgical specialties, the low number of women at the highest levels is inconsistent with the available pipeline, and Dr. Keith Lillemoe stated the following in his 2017 presidential address to the American Surgical Association: “The number of outstanding, qualified female candidates is more than adequate to fill every open surgical leadership position in America today. The problem is not the pipeline—it is the process.”<sup>22</sup>

Despite the disparities, Carr et al.<sup>23</sup> found that 40% of the academic institutions they studied had no programs for recruiting, promoting, or retaining women (frequently describing such programming as unnecessary). Indeed, structural and institutional bias are increasingly recognized as factors in gender disparities, while conventional reasons such as lack of qualified women (insufficient or leaky pipeline) are being refuted.<sup>9,13,24</sup> However, midcareer and senior women in medicine, including but not limited to those in neurology, have faced years of implicit (unconscious) bias, which at times rose to the level of explicit (conscious) bias—slowing their career growth, causing them to be overlooked for well-deserved recognition and promotions, and making them uncomfortable and even unsafe in their workplaces. Importantly, although this report is focused primarily on women physicians and researchers, there is no doubt that it is imperative to address inclusion and safety for every worker, student, and patient—across gender, ethnic, racial, sexual orientation, ability level, and other factors that may make them vulnerable to mistreatment such as bullying, harassment, bias, or discrimination.

## The inequity spectrum

Research on gender disparities demonstrates a spectrum of inequities that range from microinequities to macroinequities,<sup>25</sup> with the latter having easily identifiable and quantifiable metrics (e.g., compensation or promotion). While studies of microinequities are frequently quantitative and report data, the metrics used are often unique and sometimes quite creative. For example, one microinequity study demonstrated via video recordings of Grand Rounds speaker introductions that when compared with men, women's professional titles were used less frequently.<sup>17</sup> In a study assessing the representation of men and women physicians (and information about their work) in newsletters published by the American Academy of Physical Medicine and Rehabilitation over a period of more than 5 years, my colleagues and I found that while men were always included, women were completely excluded from more than one-third of the newsletters.<sup>26</sup> In another study, we found that women were represented at lower than expected levels among authors of perspective-type articles published in the 4 highest-impact pediatric journals.<sup>13</sup> These types of studies have added to a growing body of evidence demonstrating how women are often subtly marginalized, silenced, or made invisible. The building of one's professional reputation is both vital and nuanced,<sup>27</sup> and the cumulative effect of many subtle slights may have a more pronounced effect on women's careers than previously recognized.

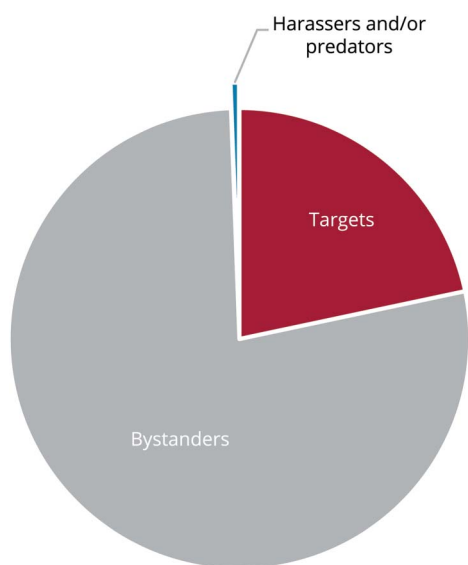
## Gender bias and sexual harassment

Gender bias and disparities likely provide fertile ground for sexual harassment, and it is clear that medicine has a serious problem with these issues. The landmark report from the National Academies of Science, Engineering and Medicine (NASEM) titled *Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine* stated that “gender discrimination itself harms women and the broader meritocracy of science. And thus we conclude that together, gender discrimination and male domination are features of the academic science, engineering, and medicine climate that create a permissive environment for sexual harassment.”<sup>28</sup> The report describes the normalization of gender-related harassment (including but not limited to sexual harassment) in medicine, and sheds light on the current literature. Relevantly, the true incidence and prevalence is likely underestimated for a variety of reasons (e.g., underreporting by those affected, reluctance to label offending, demeaning, or intrusive behavior as harassment, or failure to follow good research practices). As the report explains, large

proportions (and in some studies the majority) of women in academia in general, inclusive of health care training environments such as medical schools and academic medical centers, are targets. For example, surveys of 2 large institutions revealed that 45% to nearly 50% of women medical student respondents had experienced incidents of faculty/staff-on-student sexist hostility.<sup>28</sup> Moreover, women medical student respondents were more likely to have experienced faculty/staff-on-student sexist hostility than their same-institutional-system peers in undergraduate, graduate, non-science-engineering-medicine, science, and engineering studies.<sup>28</sup> Importantly, it is becoming increasingly clear that in some instances medical schools and other health care organizations have one or more serial harassers who have continued their behavior over the course of many years and affected many targets (generally women, but men and others across the gender spectrum as well). Bystanders who have witnessed or heard about this behavior also may have been negatively affected (figure 1). Although the vast majority of men in medicine are professional and respectful of those with whom they interact and there is no evidence to suggest that most men are guilty of harassment, authors of the NASEM report concluded that “Environments where men outnumber women, leadership is male dominated, and/or jobs or occupations are considered atypical for women have more frequent incidents of sexual harassment for women.”<sup>28</sup> Therefore, likely a small group of people, primarily though not exclusively men, who are too often serial harassers or predators are poisoning medicine’s learning and working environments.

The key to changing the normalization of sexual harassment then is to recognize that health care leaders’ actions aimed at

**Figure 1** Sexual harassment in medicine



This graphic is inclusive of all genders and is intended to show that the proportion of serial harassers or predators (which is unknown) is a much smaller group compared to targets and bystanders.

ridding their institutions of toxic behavior exhibited by a proportionally small group of people will determine what happens in the future to a much larger group of people. For example, a few months following the release of the NASEM report, NIH Director Francis Collins acknowledged that sexual harassment is “morally indefensible, it’s unacceptable, and it presents a major obstacle that is keeping women from achieving their rightful place in science.”<sup>29</sup> He went further to issue a formal apology, stating, “To all those who have endured these experiences, we are sorry that it has taken so long to acknowledge and address the climate and culture that has caused such harm.”<sup>29</sup> Finally, he acknowledged, “We are concerned that NIH has been part of the problem [and] we are determined to become part of the solution.”<sup>29</sup> In response, the NIH launched a website with new resources and policies aimed at reducing sexual harassment in academic medicine.<sup>30</sup> Similarly, Time’s Up Healthcare launched in early 2019 as a not-for-profit affiliate of the Time’s Up organization formed in response to the #MeToo movement and focused on ensuring an equitable and safe environment for everyone.<sup>31</sup>

Whatever form they take, the evidence demands that both gender discrimination and sexual harassment, which are overwhelmingly directed at women, must be recognized by the medical and scientific community as morally indefensible and unethical:

1. Discrimination is antithetical to the tenets of professionalism in medicine.<sup>32</sup>
2. Gender discrimination itself harms women, and supports organizational environments in which sexual harassment has been normalized.<sup>28</sup>
3. Sexual harassment itself is a form of discrimination.<sup>28</sup>
4. Academia has a high prevalence of sexual harassment.<sup>28</sup>
5. “By far, the greatest predictors of the occurrence of sexual harassment are organizational.”<sup>28</sup>
6. Gender equity is a moral imperative.<sup>33</sup>

Therefore, we must conclude that leaders of all health care-related organizations have a moral and ethical imperative to expeditiously address both gender discrimination and sexual harassment of women in medicine.

## Gender-related disparities for women physicians in neurology

The evidence base regarding disparities for women in neurology—where women constitute approximately 45% of trainees,<sup>34</sup> 30% of neurologists in practice,<sup>35</sup> and 40% of faculty in academic medicine<sup>19</sup>—is growing and issues identified include compensation,<sup>6</sup> academic promotion,<sup>7,20</sup> leadership,<sup>36,37</sup> recognition awards given by the American Academy of Neurology (AAN),<sup>10,16</sup> journal editorial board representation,<sup>5,12</sup> and publishing.<sup>20</sup>

## Physician compensation

There is a spectrum of inequities that range from micro-inequities to macroinequities,<sup>25</sup> but there is no doubt that compensation is among the most important. A growing body of published research and national surveys from Doximity, Medscape, and specialty societies collectively and undeniably demonstrate that disparities in compensation for women in medicine often exist even after accounting for variables such as part-time employment and differences in productivity. For example, in a study by Jena et al.<sup>6</sup> looking at gender-related differences in academic physician salary in 24 US public medical schools across 12 states (n = 10,241 physicians; 3,549 women), researchers found that men in neurology (n = 307) were paid an average of \$30,482 (95% confidence interval \$9,731 to \$51,592) more than women annually (n = 142) even after adjusting for gender, age, years of experience, faculty rank, scientific authorship, NIH funding, clinical trial participation, and Medicare reimbursements. From these data, researchers estimated that women academic neurologists were making approximately 85 cents for every dollar or 85% of the adjusted salaries paid to colleagues who were men.<sup>6,38</sup>

While limitations are applicable to any research, including the Jena et al.<sup>6</sup> study, I found it interesting to consider how compensation in neurology was ranked among the 18 different surgical and nonsurgical specialties included in the report. Among the 36 groups of men or women across 18 specialties, women in neurology were ranked last—earning the least amount annually compared to all of the others (figure 2). My comparison of same-specialty gender-related adjusted salaries revealed that the largest gap for women when compared with men among the 18 specialties was in neurology (15%; range –0.8% to 15%).<sup>6</sup> Furthermore, women in neurology had the largest gap in salary as a percentage of same-gender specialty-related adjusted salary (figure 3; 17.7%; range –0.8% to 17.7%).

To demonstrate the profound negative consequences this kind of pay disparity can have over the course of a woman neurologist's career, I utilized a set of publicly available online financial modeling tools. I found that if a woman received an additional \$30,482 in salary each year, after 40 years of investing and with adjustment for inflation, she would have a net return of \$2,507,647 (figure 4).<sup>39–41</sup> Arguably, this is a conservative analysis, not taking into account that her return on investment (ROI) may be negatively affected by the possibilities that (1) at the beginning of her career, she could be paying a higher proportion of her salary toward debt and the money she owed may have been associated with an interest rate higher than the historical rate of return; and (2) as her career progressed, her rate of promotion may be slower and to a lower level overall (never reaching the highest levels) than her colleagues who are men. Although readers may take issue with elements of this example, no one should miss the main point: disparities in pay can generate a huge deficit in a person's financial standing over the course of a career.

## Leadership, academic promotion, and publishing

Women neurologists also have been underrepresented in leadership positions and academic promotion, particularly to professor level, in neurology.<sup>5,19,36,37</sup> Disparities in representation on editorial boards, especially at the highest levels, is also a pervasive problem in neurology as well as other specialties.<sup>5</sup> Lack of equitable representation on journal editorial boards is itself a gender-related disparity and it may also contribute to other disparities including those in publications, grant funding, academic promotion, leadership positions, and compensation.<sup>13,42,43</sup> However, editorial board disparities have been shown to be relatively simple and inexpensive to fix and a number of journals, including some with high impact factors, have done so.<sup>44</sup> A comment published by editors at *The Lancet* stated the following:

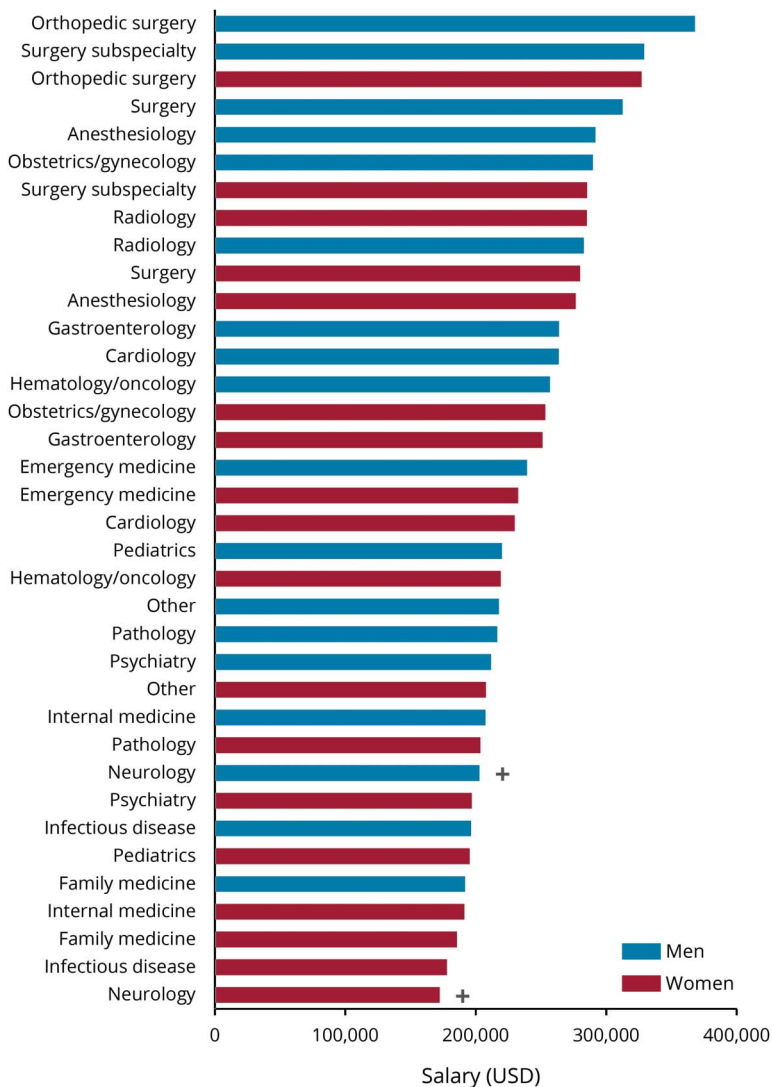
*We have been involved in, and support efforts to expand, the adoption of the Sex and Gender Equity in Research (SAGER) Guidelines that address the inclusion of sex and gender analysis in research content. Complementary guidelines are under development (SAGER II) to provide a framework for publishers and journals to strive for gender balance in their workforce. The academic publishing community must recognise that it is not immune to sexism and gender bias. Now is the time to take decisive action to challenge the status quo.*<sup>44</sup>

Importantly, the journal *Neurology*<sup>®</sup> is currently addressing disparities on its editorial board in an effort to be more diverse and inclusive.<sup>45</sup>

When my colleagues and I studied the largest or most influential professional societies associated with 39 different specialties, we found that during the most recent decade (2008–2017), 10 societies (26%), including the AAN, had 0 years with a woman as president.<sup>37</sup> Among these 10 societies, the AAN was associated with the third highest proportion of women in the specialty (28%). The 2 societies associated with higher proportions of women in the field than neurology were dermatology (47%) and pathology (37%). The 7 remaining societies with 0 years with a woman as president were associated with specialties having much lower proportions of women in the field (5%–18%), including 5 surgical specialties. Notably, 15 specialty societies associated with lower percentages of women in the field than neurology (<28%; and including 7 surgical specialties) had more years with a woman as president (1–4 years) than the AAN.

In the 71-year history of the AAN, there has been only 1 woman president, Sandra Olson, MD (2001–2003), and thereafter no woman led the AAN for 2 decades. In the future, Orly Avitzur, MD, MBA, is slated to be the second AAN president who is female (2021–2023). Given the growth of women in neurology and among members of the AAN, if history repeats itself and Dr. Avitzur is the sole woman president of the society during the next couple of decades, women would continue not only to be inequitably represented among presidents, but metrics would demonstrate a regression in progress toward gender equity in leadership.

**Figure 2** Rank of academic physicians' salary by specialty and gender



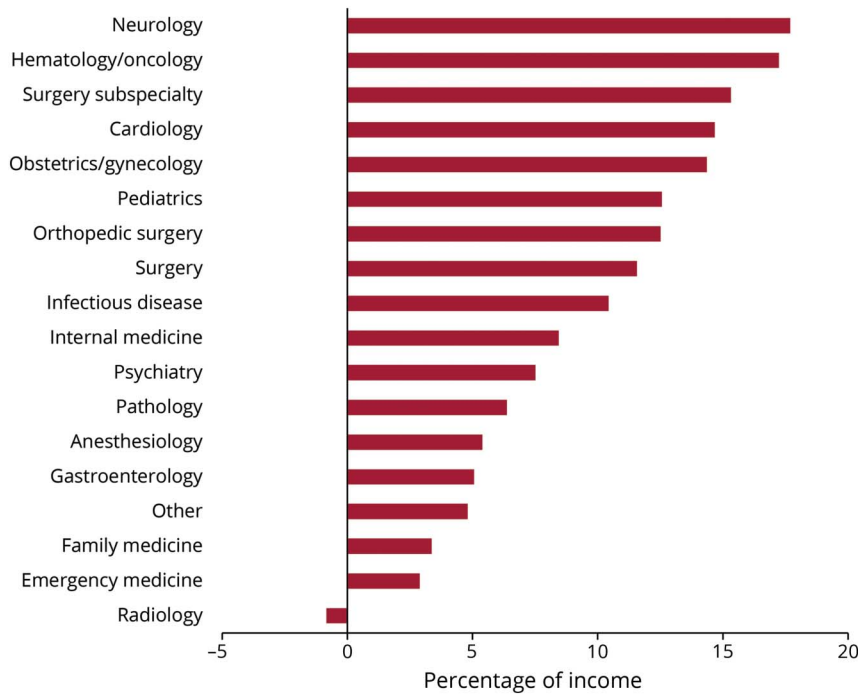
To examine the rank of academic physicians' salary by specialty and gender, the adjusted salaries\* of men and women practicing in 18 specialties at 24 US medical schools across 12 states as determined by Jena et al.<sup>5</sup> were sorted from largest to smallest. Women physicians in neurology were ranked 36 of 36, and 8 steps below men physicians in neurology (+). \*Adjustments included those for gender, age, years of experience, faculty rank, scientific authorship, NIH funding, clinical trial participation, and Medicare reimbursements.

This example demonstrates a serious issue in gender equity research—there is a difference between celebrating a woman’s accomplishments (Drs. Olson’s and Avitzur’s elections) and suggesting that these accomplishments represent organizational progress in gender equity.<sup>46</sup> Instead, to avoid undermining real progress in gender equity as well as identify and address gaps, we must use scientific methodology along with a comprehensive set of metrics and longitudinal data analysis to confirm conclusions. For example, membership data from the AAN’s 2019 Insights Report (personal communication, Orly Avitzur, MD, MBA) reveals that the percentage of women members has been increasing and in 2018 nearly 40% of all members and 50% of junior members (i.e., physicians in neurology training programs or postdoctoral fellows in research training programs) were women. Therefore, a reasonable target for equitable presidential representation at the AAN over the next 2 decades would be approximately 40%–50%—or 8–10 of 20 years or 4–5 of the ten 2-year

terms. However, to achieve equitable presidential leadership at the AAN, the society’s leaders and members will need to analyze and address its culture and processes. As a medical ethicist stated, “Leaders establish and maintain an organization’s moral culture, leading to implicit and explicit behavioral norms...The ethical response is to systematically promote women and diverse people into leadership positions.”<sup>33</sup>

Knowing that some people might assume women do not want to run for or hold elected leadership positions, Shillcutt et al.<sup>47</sup> published a follow-up survey study of more than 1,200 women physicians, inquiring about their experience and interest in elected positions. We found that 43.8% (n = 535) ran for office during high school and medical school compared with 16.7% (n = 204) thereafter.<sup>47</sup> However, the majority of women surveyed (nearly 60%) reported that they would consider running for office at their workplace and

**Figure 3** Rank of women academic physicians' specialty-related salary gap as a percentage of income



To examine the rank of women academic physicians' salary gap by specialty, the differences between adjusted salaries\* of men and women practicing in 18 specialties at 24 US medical schools across 12 states as determined by Jena et al.<sup>6</sup> were normalized by dividing the differences by the respective adjusted salaries for women academic physicians in the field. Among 18 specialties, women in neurology were ranked no. 1 and face the largest normalized salary gap as percentage of income. \*Salary adjustments included those for gender, age, years of experience, faculty rank, scientific authorship, NIH funding, clinical trial participation, and Medicare reimbursements.

approximately 50% would run for office in their medical society in the future. In addition to reporting a loss of family time as a barrier, respondents noted that lack of encouragement by their boss or supervisor was a major obstacle. They also stated that mentorship and gaining further experience would be helpful.

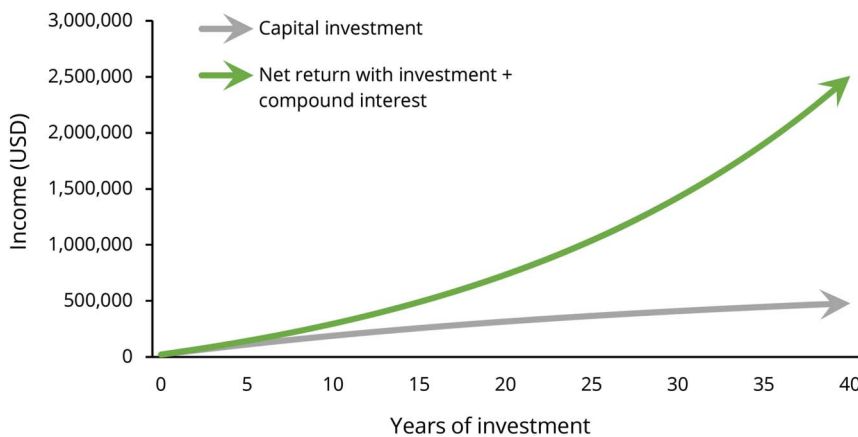
### Recognition awards

In previous work, my colleagues and I also explained the power of zero—citing how an “inexorable zero” (a true zero or near zero level) often has been used by US courts as a prima facie inference of discrimination. Using recognition awards as

a metric, we showed that inexorable zeroes existed for women among recipients of recognition awards in 7 medical specialties, including neurology, and in 14 different medical societies, including the AAN and the American Neurological Association.<sup>16</sup> Subsequently, we studied recipients from the AAN further, concluding the following:

*Although it has been more than 2 decades since the proportion of women among US neurologist members of the AAN was lower than 18%, 1 in 4 AAN award categories demonstrated 0%–18% representation of women among physician recipients during the most recent decade.<sup>10</sup>*

**Figure 4** Consequences of salary gap on a woman academic physician's personal investment income



Using a set of publicly available online financial modeling tools,<sup>39,40</sup> I examined the consequences of salary disparities on long-term income. I started with the assumption that a woman received an additional \$30,482 in salary each year; that is, the dollar amount that would negate the salary gap Jena et al.<sup>6</sup> identified for women in neurology. Using the 2018 marginal tax rate for a single or separately filing taxpayer with a \$200,000 income (32.9%),<sup>39</sup> I calculated that this woman would have \$20,453 of additional income available after taxes annually. After a 3% adjustment for inflation and in today's dollars, over 40 years she would have earned an additional \$479,036 of income.<sup>40</sup> If she invested that gap-related additional income in a balanced mixed portfolio of 60% bonds and 40% stocks with a historical (1926–2017) average annual compounded investment return of 7.8%,<sup>41</sup> after a 3% adjustment for inflation and in today's dollars, over 40 years she would have accumulated \$1,395,060 of pre-tax investment income and booked a net return of \$2,507,647.<sup>40</sup>

In a letter to the editor published in *Neurology* regarding our study of AAN recognition awards, one reader attributed the disparities to childbearing,<sup>48</sup> even though we pointed out that a lack of qualified women neurologists was likely not an issue as there was a sufficiently large and documented pool of highly accomplished candidates at the professor and associate professor levels.<sup>49</sup> Indeed, causality is multifactorial and not well-understood; however, in one study in which we analyzed nomination data, we found that women were nominated for training and early career awards but were not selected by the committee as recipients, while no women were nominated for prestigious later career awards.<sup>46</sup>

### Physician burnout and gender disparities

Physician burnout is a crisis issue among all specialties. However, neurology has been ranked among the top specialties at risk for burnout,<sup>50–52</sup> and risk is likely more pronounced in women.<sup>53</sup> Admittedly, there is a need for more research on how bias and discrimination affect symptoms of burnout; nevertheless, it is logical to conclude that treating workers unfairly almost certainly influences how they feel about their job. After all, because promotions tend to increase autonomy and a sense of control, slow or stalled career advancement may increase the risk of burnout. Similarly, maintaining a sense of personal accomplishment (a risk factor for burnout) may be more challenging for women if they are not fairly compensated and valued by others.

### Men and the collateral consequences of gender disparities in academic medicine

To drive change, one must not only understand the various perspectives of those directly affected, but also the perspectives of those who bear witness to what is happening. For example, a man who is in mid or late career is far more likely than a woman at the same stage to have personally benefited from or at least felt supported by an inequitable recognition, reward, and career advancement system. However, because these metrics do not tell the whole story, we might wonder whether men have truly been as fortunate as the data suggest. Moral people must certainly feel a heavy emotional toll when they are participating in, working in, or witnessing an unjust system in which women are systematically mistreated. As the NASEM report points out, sexual harassment negatively affects not only targets but also bystanders who are witness to the mistreatment.<sup>28</sup> Therefore, even men who have enjoyed the benefits of privilege may be paying an emotional price in the form of moral distress or burnout symptoms if their success is due in part to the systematic oppression of women.

Interestingly, men were undercompensated in one of the specialties examined by Jena et al.<sup>6</sup>—radiology—even after accounting for variables that could affect income. Recently, Google began examining its compensation data as well, and

found that in some cases men were being underpaid when compared with women.<sup>54</sup> Thus, men too are at risk of losing millions of dollars over time due to compensation inequities. Moreover, this risk may increase if women who ascend to leadership positions adopt the practices of current leaders that favor same-gender compensation outcomes. Therefore, it is in everyone's best interest—including men—to use an impartial and scientifically driven approach to compensation that ensures that all workers, regardless of gender, are paid fairly.

### Gatekeepers and the collateral consequences of gender disparities in academic medicine

Career advancement in academic medicine may involve various types of promotion, and advancement from instructor to professor relies on several factors that a promotions committee must consider. Many of these are reported in the curriculum vitae (CV)—a formulaic document that has sections for grant funding, publications, recognition awards, committee assignments, and leadership positions.<sup>16</sup> Moreover, the number of publications as well as their impact (i.e., bibliometrics such as number of citations and Hirsch index) are part of the analysis.<sup>55,56</sup> Therefore, although the promotions committee resides at the faculty member's home institution, gender bias or disparities occurring at the level of funding agencies, journals, and medical societies may severely limit a woman's ability to be promoted. While many medical institutions are making large financial investments in improving diversity and gender equity, none of these investments will be fully realized if barriers to women's success are imposed by any of 4 gatekeepers who affect an academician's CV: (1) medical schools/academic medical centers themselves, (2) funding agencies, (3) journals, and (4) medical societies. Importantly, if any of the gatekeepers does not treat women fairly, then the success of efforts (and financial investments) that the others make in driving and achieving diversity and gender equity will be reduced, and ROIs remain unrealized (figure 5).

For example, in a recent study published in *JAMA* by Oliveira et al.,<sup>8</sup> among first-time Principal Investigator NIH grant awardees across all grant types and institutions, women received a median award \$39,106 less than men (\$126,615 vs \$165,721, respectively). At Big Ten and Ivy League universities, where some of the most talented scientists are working, disparities for women amounted to a median difference in funding when compared with men of \$81,711 and \$19,513, respectively. These deeply troubling findings highlight the negative consequences of gender disparities on (1) women researchers' ability to obtain grant funding to advance their careers; (2) institutional ROI—often astronomical and incalculable financial and human resource investments made by the home institutions in the recruitment, retention, and success of a large proportion of their scientific workforce<sup>18,57–59</sup>;

**Figure 5** Consequences of gender bias on return on investment



Even if a gatekeeper—an institution whose environment or actions directly affect the careers of physicians and scientists, particularly in academic medicine—makes investments in diversity by hiring, funding, and supporting women, the gatekeeper's return on investment may be negatively affected if any of the other 3 gatekeepers fail to treat them equitably. The icons used in figure 5 were found via Bing search through Microsoft Word's insert online picture function, designed by unknown authors, and inserted unchanged except for colorways under Creative Commons licensing ([creativecommons.org/licenses/by/3.0/](https://creativecommons.org/licenses/by/3.0/)).

and (3) advancement of the science and medicine women are investigating. In addition, disparities in NIH funding of this nature likely reduce the success of administrative efforts of top-level leaders (i.e., deans and chairs, who are mostly men) to support a diverse scientific workforce at the researchers' home institutions. Because gatekeepers are interdependent, even the careers of men at the highest levels of academic medicine may be negatively affected when one or more of the other gatekeepers treats women inequitably.

Similarly, if journals or medical societies demonstrate bias against women in academic medicine—negatively affecting

their ability to publish, present, or be recognized for their work through recognition awards, plenary or other lectures, and newsletter articles—then financial and other negative consequences may extend far beyond the women who are most directly affected, to their home institutions and funding agencies. Medical schools and academic medical centers, too, may be inadvertently undermining the investments that other organizations are making. For instance, the AAN has invested financial and other resources in the Women Leading in Neurology program. If women neurologists who have committed their time have lost clinical compensation or have self-funded their participation are not provided equitable



opportunities for advancement in their workplace, the AAN's ROI of financial, administrative, and human resources is reduced as well. Treating women in medicine unfairly hurts everyone—obstructing women who seek career advancement, impeding their leaders (mostly men) who are charged with improving diversity and inclusion, and causing unrealized ROI for many organizations (institutions, funding agencies, journals, and societies) in the health care system.

## Driving gender equity in academic medicine

The best way to accelerate gender equity for women in academic medicine is for all of the gatekeepers to hold each other accountable. This means that they must turn away from leaders who are supporting the status quo or the normalization of gender discrimination and sexual harassment and toward ethical leaders who are committed to organizational culture and climate change. In 2018, I developed the Be Ethical Campaign<sup>60</sup> to encourage leaders in the key gatekeeper groups to use a 6-step process (table 1) and a comprehensive set of unique and customizable metrics with longitudinal data analysis to uncover, address, and accelerate workforce gender equity, including the removal of bias, discrimination, and harassment. Avoiding critical thinking errors during this process is crucial, because they are pervasive in gender equity discussions and tend to slow or derail efforts (table 2).<sup>60</sup>

Importantly, every medical specialty, including neurology, needs to examine its own history, particularly over the last 2 decades, as this is the timeframe most relevant to the majority of women who are in the specialty currently and interventions enacted now will affect their career trajectory for the coming years. What might an ethical path forward in neurology look like for mid-career US women neurologists who have been represented at markedly disproportionate levels as professors, department chairs, medical society presidents, recognition award recipients,

and senior editors of neurology journals and who have not received equitable compensation or research funding? If the situation was reversed and over the last 2 decades a large body of evidence showed that men were not fairly compensated, promoted, or recognized, and they were often ignored and silenced, what would today's leaders do now to address this?

Many organizations have been increasing their efforts to address gender equity, inclusion, and safety, and, while a complete list is beyond the scope of this report, some examples include the following: Association of American Medical Colleges' "Promising Practices for Understanding and Addressing Salary Equity at US Medical Schools"<sup>61</sup>; American College of Physicians' "Achieving Gender Equity in Physician Compensation and Career Advancement"<sup>62</sup>; Association of Women Surgeons' "Strategies for Identifying and Closing the Gender Salary Gap in Surgery"<sup>63</sup>; American Surgical Association's "Ensuring Equity, Diversity, and Inclusion in Academic Surgery"<sup>64,65</sup>; and the American Medical Women's Association's "Revolution by Resolution."<sup>66</sup> Moreover, professional societies and other organizations are launching initiatives aimed at working together and sharing resources and best practices. For example, the American Academy of Pediatrics, American Academy of Family Physicians, American College of Physicians, American College of Obstetricians and Gynecologists, American Psychiatric Association, and American Hospital Association recently launched "Women's Wellness through Equity and Leadership,"<sup>67</sup> which will train a cohort of health care professionals in critical leadership skills and develop principles regarding healthy work environments for physicians.

Recently, neurologists have been focusing on their own culture of diversity and inclusion, including but not limited to equity for women neurologists, and both formal and informal initiatives and networks are supporting this work. Table 3 lists some important initiatives by neurology organizations, including the AAN's Women's Leadership Program, which are focused on closing leadership gaps and addressing other disparities for women in neurology. Still, the field has some catching up to do, and "recent data in neurology show that we lag behind the rest of medicine with continued gender disparities."<sup>38</sup> In an editorial I wrote titled "Can neurologists come from behind and lead the way in physician gender equity?"<sup>68</sup> I commented that this specialty might be the dark horse that surprises us all, in part because neurologists are used to solving challenging problems and embracing scientific methodology. I recommended getting 2 houses in equitable order as quickly as possible—neurology medical societies and journals—because these organizational gatekeepers tend to set the tone for a specialty. Further, if the most influential leaders from the 4 gatekeeper groups in neurology convened and each agreed to use the 6-step process outlined in table 1, neurology would be among the first specialties to use an aligned and scientifically driven strategy to accelerate progress for women in medicine. Neurologists need to unite and commit to treating their talented women fairly. When that happens, everyone wins.

**Table 1** Systematic 6-step process toward achieving organizational gender equity<sup>a</sup>

Step	Action
1	Examine gender data through the lens of an organization's mission, values, and ethical code of conduct
2	Report the results transparently to all stakeholders
3	Investigate causes of disparities
4	Implement strategies to address disparities
5	Track outcomes and adjust strategies as needed
6	Report/publish results

Health care institutions and affiliated organizations must take a systematic approach to addressing gender disparities that involves unique and customized but defined metrics and transparent reporting to all stakeholders.<sup>60</sup>

<sup>a</sup> Table reproduced with permission from the Be Ethical Campaign report.

**Table 2** Critical thinking errors related to gender equity<sup>25</sup>

Critical thinking error	Example
<b>Perpetuating myths</b>	Leaders and colleagues thinking that there are not enough qualified women to fill positions, particularly leadership positions
<b>Holding the affected group responsible for the problem</b>	Leaders and colleagues blaming women for gender-related disparities in compensation, promotion, and publishing, and expecting women to fix the disparities themselves
<b>Preserving willful ignorance about the problem</b>	Failure of institutional and organizational leaders and colleagues to read, understand, and respond in a timely manner to the growing evidence-based gender disparity literature
<b>Presuming that the affected group should conform to the establishment culture</b>	Leaders and colleagues failing to understand that outdated organizational processes, criteria, and rules—such as, but not limited to, hiring and admission practices and evaluation and promotion standards—may not support equitable inclusion of a diverse workforce

## Discussion

At this unique time in history, there is an opportunity for leaders in neurology to strategically and expeditiously address its workforce gender disparities. To do so, there will need to be a concerted effort among the 4 gatekeeper organizations: (1) medical schools/academic medical centers, (2) government and other funding agencies, (3) neurology journals, and (4) neurology professional societies. Leaders will have to plan an intentional path forward, and in their own organizations overcome barriers to an equitable and safe work environment for women. Moreover, leaders in all 4 types of organizations must hold each other accountable for gender equity as their own success and financial ROI is dependent on the efforts of those in the other categories. In short, the path forward is to focus on ethical principles and behavior when it comes to addressing workforce gender disparities for women in medicine.

## Author contributions

J.K. Silver: drafting/revising the manuscript, data acquisition, study concept or design, analysis or interpretation of data, accepts responsibility for conduct of research and final approval, acquisition of data, statistical analysis.

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**Table 3** Organizational initiatives for women in neurology<sup>a</sup>

Sponsor	Initiative	Description and purpose
<b>AAN</b>	Leadership for Women Subcommittee	Subcommittee of the Leadership Development Committee responsible for the following: <ul style="list-style-type: none"> <li>• Development and implementation of the Women Leading in Neurology Program</li> <li>• Implementation of additional annual meeting and regional programming focusing on women in leadership</li> </ul>
	Women Leading in Neurology Program	A 1-year midcareer leadership training program for up to 12 women neurologists requiring the following: <ul style="list-style-type: none"> <li>• Participants to attend leadership retreats, coaching calls, and small group calls</li> <li>• The AAN to cover all program-related expenses for the selected participants</li> </ul>
	Women's Issues in Neurology Section	Section of the AAN, with nearly 800 members, focused on the following: <ul style="list-style-type: none"> <li>• Integrating sex and gender into neurology research</li> <li>• Supporting women neurologists' careers through activities such as mentorship network, speaker nominations, committee membership, and FAAN applications</li> </ul>
<b>Independent</b>	Women's Neurology Group	Facebook group of more than 2,500 members that provides an online community through which women neurologists can share professional information and expand their professional network

Abbreviations: AAN = American Academy of Neurology; FAAN = Fellow of the American Academy of Neurology.

<sup>a</sup> This is not intended to be a complete list.

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Julie K. Silver

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