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Women in trauma surgery: advancing our profession through international collaboration

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INTRODUCTION

In her presidential address for the Association of Academic Surgery (AAS) in 2017, entitled 'Sticky Floors and Glass Ceilings,' Dr Caprice Greenberg discussed the many challenges faced by women seeking to advance in surgery.[1] She highlighted the salary gaps between male and female surgeons and studies that have demonstrated that 40% of that gap cannot be explained by different career trajectories or specialty choices. She also spoke of the impact of implicit bias on early career investment and grant funding which can be a significant disadvantage to women at the outset of their academic career. Finally, she spoke frankly about the challenges female surgeons face in navigating expected gender schemas.

These challenges are not unique to the USA, and varying cultural issues that affect women across the world can further impact women who pursue a surgical career. Societal expectations of gender roles may significantly limit opportunities for women. A recent article from Pakistan reported that although 70% of students entering medical school in Pakistan are women, women represent only 14% of surgeons who have completed training since 1967.[2 3] Furthermore, it is reported that approximately 50% of female doctors do not practice or undertake specialty training after graduating from medical school due to family and social pressures. In a survey of over 200 female surgeons, >80% of Pakistani surgeons noted that gender discrimination and bias impacted their job satisfaction and 56.4% were told they could not become a surgeon because of their gender. Particular challenges were noted in identifying senior mentors and in interacting with nurses. Another study which surveyed female surgeons in Japan identified gender-biased discrimination and a lack of family support as impeding their careers.[4]

In August of 2023, the World Trauma Congress (WTC) convened in Tokyo, Japan. A panel discussion titled 'Women in Trauma Surgery in the World' was conducted. It included female trauma surgeons of different backgrounds, ages and roles within their organizations representing the following locations: the USA, Japan, New Zealand, South Africa, Panama, Brazil and the Philippines. This panel discussed some of the common challenges faced in our community. It also highlighted the innovative work being led by women in trauma surgery focused on injury prevention, health equity, global surgery, education, and strategies to address provider wellness. The collective experience of this unique group is reflected in this review.

WOMEN IN TRAUMA SURGERY: AN INTERNATIONAL PERSPECTIVE

In the USA, women represent approximately one-third of the physician workforce. In the field of surgery, however, the numbers are lower. Recent data from the American Medical Association indicate the proportion of female surgeons is 22% in general surgery, 9% in neurosurgery, 6% in orthopedic surgery, 17% in plastic surgery, 8% in thoracic surgery, and 15% in vascular surgery.[5] As trauma systems have developed around the world, the most severely injured patients are triaged to regional trauma centers with the appropriate resources to optimize outcome. Although the initial surgical care of injured patients remains an important part of the training for all general surgeons, the advanced care of these patients has become a specialty in many countries. In the USA, the field of acute care surgery (ACS) which encompasses trauma, emergency general surgery and surgical critical care was initially described in 2005 and through the leadership of the American Association for the Surgery of Trauma (AAST) has developed into a specialty with dedicated fellowships and a defined training curriculum. The ACS model, which emphasizes a team-based approach, has been very popular among surgical residents, offering the potential for a better balance of clinical and non-clinical commitments. A recent survey of US hospitals demonstrated that 50% of hospitals had at least one female surgeon providing emergency general surgery care and 9.4% had over 40% women on the ACS faculty.[6] Despite the growing interest in the field, data from the American Board of Surgery indicate that as of 2018, 28% of surgeons board certified in critical care were women despite that fact that half of the students entering medical school in the USA are women. These numbers highlight a persistent gender disparity in trauma surgery as described by Foster *et al* and confirm the fact that fewer women than men pursue careers in trauma surgery in the USA.[7] It is also important to note that trauma and ACS coverage services are often provided by surgeons who are not board certified in surgical critical care which suggests that the number of female surgeons caring for critically ill patients may be different from the estimates above.

Dr Kaori Ito represented Japan at the WTC and reviewed the fact that the Japanese experience is starkly different from that of the USA. Although the percentage of women entering medical schools in Japan is close to 40%, a survey on the gender distribution in each specialty conducted by the Japan Surgical Society (JSS) revealed that the percentage

of women in surgery was only 10%.[8] Furthermore, there were only *three* board-certified female acute care surgeons in Japan. In addition, the percentage of female trustees or delegates in surgery was less than 1% and *zero* in ACS. Dr Ito hypothesized that one reason for this may be the traditionally low number of women in the JSS as a whole, and the fact that even today, there are few women in leadership positions. The JSS, founded in 1898, is one of the most traditional surgical societies in the world. In a 2022 survey, the percentage of female members of the JSS was 10%. Until 2021, no woman had held a position higher than that of director. The JSS began to support the promotion of female surgeons, and in 2021, a quota for women was established for the position of director. Two women were elected to the board of directors. Another problem was the extremely low percentage of female delegates to the JSS at only 0.6% at the time of the 2022 survey.[8] This fact is taken seriously, and 50 women were directed to the position of delegate in 2023. Although the JSS has lagged behind in terms of gender equality, it is now creating an environment in which female surgeons can play a leadership role. According to Dr Ito, 'promoting gender equality in acute care surgery and surgery overall appears to be an urgent issue in Japan.'

Dr Rebecca Schroll described the characteristics of surgeons who provide trauma care in New Zealand (NZ). The vast majority of trauma patients in NZ are cared for by general surgeons and subspecialists who are Fellows of the Royal Australasian College of Surgeons (FRACS) and satisfy the college's training requirements in general surgery, which include basic trauma care. All general surgeons in the area also take the Definitive Surgical Trauma Care course, which is a requirement to be on call for general surgery. There are only a handful of surgeons in NZ who have done formal trauma fellowship training. Most are located in Auckland (NZ's largest city) with the exception of one each in Waikato, Christchurch and Dunedin which are smaller cities in NZ. In terms of demographics, 20% of NZ general surgeons are women, though 44% of general surgery trainees are women. Two of the NZ general surgeons with formal trauma fellowship training are women. Auckland City Hospital has the only Royal Australasian College of Surgeons (RACS)-verified trauma fellowship in NZ, and 3 out of 17 trauma fellows since fellowship inception have been women.[9] Both are comparable with the total number of general surgery FRACS who are women. The overall perception is that women are as well represented in trauma surgery and general surgery as a whole. In regard to leadership positions, over half of the board of directors in the Australian & New Zealand Trauma Society, the regional specialty society, are women.[10]

Dr Martha Quiodettis from Panama attempted to identify similar data on the number of female trauma/acute care surgeons in South America, but these data have not yet been collected. In 2017, a study from Brazil indicated that surgical subspecialties remain predominantly male with women comprising 15% of the surgical workforce. Surgical subspecialties like urology and orthopedics had very little representation. Women make up only 1.9% and 6.0% of their workforce, respectively. This was attributed to the study factors such as prejudice, an absence of female leaders in surgery, and perceptions of difficulties in balancing work, personal life, and motherhood.[11]

THE ROLE OF PROFESSIONAL SOCIETIES

In the USA, since the Association of Women Surgeons was established by Dr Patricia Newman in 1981, the importance of supporting career advancement and leadership opportunities for women in surgery has been recognized. Professional societies play a pivotal role in this regard. Although all of the major professional societies representing trauma and emergency general surgery in the USA and Europe have seen women rise to leadership positions in recent years, it is clear that leadership opportunities for women in trauma surgery are still lagging behind opportunities for men. As identified by Foster *et al*, 'professional societies play an incredibly influential role in establishing the reputation of those seeking promotion and providing a forum for highlighting academic or leadership accomplishment.' In their review of female membership and leadership of trauma and ACS societies in the USA, they found variability. It is important to note that this review included data through 2018 and represents the most current literature on this particular subject. It is possible, however, that these percentages may have changed slightly. The AAST had the highest percentage of women in executive leadership positions overall (32.5%), followed by the Western Trauma Association (WTA) (19%) and the Eastern Association for the Surgery of Trauma (EAST) (18.8%).[7] At the highest level of these organizations, the role of president, the number of women who have served in this role is limited. Although the AAST was founded in 1938, the first female trauma surgeon was elected president in 1988. The WTA elected its first female president 38 years after its inception. EAST was founded later than both organizations in 1988 and elected its first female president 19 years later. Interestingly, of the five authors on this manuscript, three have been elevated to the role of president-elect/president of their professional societies (Dr Eileen Bulger: AAST, Dr Quiodettis: Pan-American Trauma Society, Dr Nicole Fox: EAST).

In the spring of 2020, the COVID-19 pandemic led to a unique situation. A group of senior women in trauma surgery from across the globe began meeting virtually for mutual support and advice as the challenges of the pandemic unfolded. Encouraged by the global reach of virtual meeting platforms and recognizing the need for ongoing dialog to address the issues facing female surgeons across the globe, this group evolved into the Women in Trauma Surgery (WITS) group, which is now sponsored by the AAST. WITS is an international group of surgeons, open to all (men and women) who are interested in addressing the 'sticky floors' and 'glass ceilings' that continue to prevent everyone from thriving in their chosen profession. The group forums garnered interest both within the American trauma community and abroad, resulting in presentations and panel sessions at the first three virtual All Levels Trauma Conferences sponsored by the Saudi Arabian Academy of Sciences. In addition, the group was invited to organize sessions at the European Congress of Trauma and Emergency Surgery in 2022 and 2023 and this session at the WTC in Japan in 2023.

UNIQUE CHALLENGES

Although tremendous progress has been made, unique challenges remain, particularly for young surgeons entering our field. Striking a successful balance between the responsibilities of work and home and navigating the academic promotion ladder remain challenges for all young surgeons, regardless of gender. These can be further exacerbated by micro-aggressions and occasionally macro-aggressions in the work environment. During her 2017 presidential address, Dr Greenberg encouraged the audience to 'redirect the conversation,' about challenges facing female surgeons citing salary disparities and lack of advancement in surgery as the two most pressing issues facing female surgeons in the USA today. She cited the Medscape General Surgery Compensation report that reflected an $83 000

pay gap between male and female surgeons. In addition to this, female surgeons struggle to advance academically—there is an 18 percentage point difference in the likelihood of being a full professor between men and women. Only 15% of women hold the position of surgical chair in the USA and 16% hold the position of medical school dean. Women are hired at lower salaries despite equal qualifications and leave academic medicine at a higher rate than men.[1]

These issues were reiterated by Dr Bulger and Dr Fox as they shared personal and general experiences of female trauma surgeons in the USA. Although both prepared their presentations independently for the WTC, they relied heavily on Dr Greenberg's assessment of the current state of women in surgery and cited it frequently. Both acknowledged the challenges that exist for young surgeons entering the field in terms of work–life integration and achieving academic promotion. They described an often-unspoken truth specifically related to women who strive to advance in the workplace. In her groundbreaking book 'Why So Slow? The Advancement of Women,' Virginia Valian showed that lower status and salaries are assigned to women who: engage in self-promotion, have task-oriented speaking styles, have an authoritative leadership style, administer discipline, and initiate salary negotiations.[12] This represents a paradox as these qualities may be necessary to advance into leadership positions in surgery but are perceived negatively when displayed by women.

Dr Ito viewed the USA as a successful model for female trauma surgeons compared with her own experience. In contrast to Japan, it was evident to her that in the USA, women seem to be more active in ACS than in other subspecialties. She perceived the biggest challenge in her career as the lack of female leaders and role models in ACS. Dr Ito hypothesized that subspecialties with a low percentage of women in leadership positions are less likely to attract female medical students and may have difficulty securing a workforce in the future. She thinks that because ACS services are promoting gender equality among surgeons and improving the quality of life of surgeons in the USA, the focus should be gender equality in the field of ACS in Japan so that more women can choose ACS as their subspecialty.

Dr Schroll cited challenges in the following areas: discrimination, bullying and harassment, the gender pay gap and implicit bias. Dr Schroll discussed that in 2015, the RACS set out to build a culture of respect in surgery. One of the ways they began was to conduct a survey regarding the prevalence of bullying, discrimination and harassment in Australia and NZ. They found that women experienced all of these behaviors significantly more often than men.[13] When the respondents who said they experienced these behaviors were asked to further specify the type, results showed that the more overt things such as being denied a promotion, operating lists, or training opportunities were less common, though still 20% to nearly 40%.[4] The overwhelmingly most common type of discrimination was hurtful and humiliating comments made about or towards women. In her personal experience, these types of discrimination are often dismissed as 'no big deal' saying the recipient of the behavior is 'too sensitive' and needs to 'toughen up.' This can be particularly frustrating when it comes from people who are supposed to be professional colleagues; it erodes trust and respect. Discrimination along with micro-aggressions and gender bias all contribute to a challenging workplace for women and have no place in a professional setting. Dr Schroll was encouraged that RACS has taken these issues seriously and has developed and is implementing an action plan to address these and other issues to achieve cultural change across Australia and NZ.

In terms of the wage gap, one somewhat unusual quality of the medical profession in NZ compared with other countries is that the physician workforce is highly unionized, and the minimum salary levels for specialists working in the public sector have been negotiated and are proscribed in a clearly delineated stepwise progression based on years of experience (up to a point). Theoretically, this should help to eliminate the gender wage gap. However, a recent survey of medical specialists employed in the public workforce found that women earned 11% less than men, regardless of their age, specialty, number of hours worked, or employer.[14] The authors attempted to adjust for a number of personal characteristics which are often asserted as potential confounding variables for these types of studies, as well as attempted to adjust for possible differences in experience not explained by age alone. They found the difference remained at least 8%. Although this is somewhat less than the pay gap identified in many other countries, and less than the pay gap for non-medical professionals in NZ, it is obviously still inequitable and should be rectified.

Dr Schroll poignantly described her most personal challenge as a female trauma surgeon—the implicit bias that she is not the type of person expected to be the surgeon. She is initially assumed by many people to be a nurse or medical professional other than a doctor. There are issues with other female professionals (non-physicians) treating female surgeons differently than male colleagues. This requires a need to engage in status-levelling behaviors to improve the working relationship. Dr Scroll felt that these micro-aggressions may seem less important to those who have not experienced them. Collectively, however, they add to the proverbial '1001 cuts' of emotional and mental frustration that are an additional burden for female surgeons. Furthermore, the impact of this implicit bias on clinical care was well described by Katrina Hutchinson in the *British Medical Journal* in 2020. Implicit bias compromises clinical credibility, makes it more difficult to establish trust with patients and hinders the ability to establish appropriate authority with colleagues.[15]

Dr Quiodettis from Panama shared unique aspects of her personal journey as a trauma surgeon in South America. She made the decision to pursue fellowship training in the USA after residency and then returned home to practice. She recalled that during her residency in Panama, she encountered the challenges of being a female surgeon in a field devoid of role models or mentoring programs. Dr Quiodettis stated, "there was no room for mistakes, and I had to navigate the male-dominated landscape with determination and resilience." She relied on words of encouragement from mentors and colleagues such as Dr Antonio Marttos. 'His trust that I could—and would—succeed ignited a newfound determination to overcome any obstacle in my path. Beyond the invaluable surgical experiences and knowledge gained during my fellowship, I formed lifelong connections and friendships that continue to enrich my life.' After returning to Panama, she became the head of the Trauma Unit at Hospital Santo Tomás (HST). This leadership position required administrative skills that she tackled in small steps starting with the creation of a trauma registry at the institution. She reached out to renowned experts in trauma care like Dr Rao Ivatury. This connection led to a pivotal moment when HST joined the Pan-American Trauma Society registry.

Dr Quiodettis found transformative opportunities in partnering with the Pan-American Trauma Society as they worked to build a robust trauma center in Panama. The journey was marked by teamwork, protocol development, and a commitment to changing the culture of trauma patient care at HST. On a personal note, she recalled that, 'being a woman surgeon

in a male-dominated field brought its own set of challenges. I constantly battled self-doubt, striving to believe in my abilities and decision-making skills. Balancing my roles as a spouse, mother, daughter, and professional required ongoing effort, but I remained dedicated to achieving harmony in all aspects of my life.'

LOOKING TO THE FUTURE

The international collaboration at the WTC was spectacular and led to important cross-cultural conversations. Common themes were identified among the countries represented, yet each had specific challenges that were not necessarily shared. The organization of a panel on this topic at an international conference was an important step in moving forward to decrease gender disparities in surgery. Engaging in dialog around issues such as: compensation, academic promotion, micro-aggressions and macro-aggressions and implicit bias serves to educate one another and bring attention to their existence to generate action. The next step forward is to systematically work to rectify them. Many thoughtful ideas and suggestions were proposed during the question and answer portion of the panel. They mirrored interventions to decrease gender disparities in surgery articulated by Dr Greenberg during her AAS presidential address. These include systemic and individual actions such as: transparent and objective compensation plans, objective measures of success and milestones for promotion as well as seeking opportunities to acknowledge women's contributions through 'amplification.' As the audience members and panelists engaged in lively discussion, the power of connection was evident. One month after the WTC during her presidential address for the AAST, Dr Bulger expanded on the importance of connection and attributed her career success to the 'inspirational human element.'[15] All panelists agreed that mentorship was vital to their career success and much of that mentorship was attributed to male surgeons who sponsored and advocated for them throughout their careers. Thus, as we seek to advance opportunities for women in trauma surgery, it will take all members of our profession working together to achieve that goal. In the process, we hope to create a working environment that supports all ACS surgeons across the globe.

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