

# Culture of Safety and Gender Inclusion in Cardiothoracic Surgery



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“I just don’t think women should be in an orchestra.”  
Zubin Mehta, conductor of the Los Angeles Philharmonic (1964 to 1978) and New York Philharmonic (1978 to 1990) [1]

Many notable conductors in the past have remarked that female musicians are not equal to male musicians, one going so far as to state that “the more women (in an orchestra), the poorer the sound” [1]. Until a few decades ago, the great orchestras in the United States mainly consisted of members who were selected by the music director, often male students from an elite group of teachers. Not only were the numbers of female musicians in major orchestras extremely low until the 1970s, often music directors believed that women had less musical talent. To overcome this bias, major American orchestras began to modify their audition procedures by making them open to all musicians and instituting “blind” auditions. The latter process promoted impartiality by hiding the identity of the musician using cloth screens suspended from the ceiling or portable room dividers. The Boston Symphony Orchestra used the screen in 1952 for the preliminary round of audition, while most other orchestras adopted a similar practice in the 1970s and 1980s. By the late 1990s, the screen was often employed for later rounds. Its impact is worthy of review. Among the 5 highest-ranked orchestras, none had more than 12% women until 1980. In each of these, the number of female musicians later increased substantially, so that by 1997, the New York Philharmonic comprised 35% women, the highest among the 11 orchestras studied, after being the lowest for decades [1]. By using a screen, the likelihood that a woman would be advanced during audition and hired was increased severalfold; its impact was fairness and impartiality, achieved at a relatively low cost and without any compromise [1].

For over 25 years in the United States, the average medical school class has consisted of at least 40% women; in 2017, for the first time, more women than men were enrolled in medical schools, with the former representing 50.7% of the 21,338 matriculants [2–4]. Although most of the class were women, slightly more men (50.4%) had

applied for admission [2]. The question remains as to the impact of changing demography on patient care. As suggested previously, studying the composition and hiring practices of symphony orchestras is an ideal example in understanding gender bias and diversity and its impact on quality [1]. Typically, symphony orchestras consist of about 100 musicians with some variability; in contrast to many businesses, the size of orchestras is relatively static, with nearly identical numbers and types of jobs. As such, it is unlikely that the total number of women musicians would increase simply because the number of harpists (a female-dominated instrument) has expanded [1]. Any change must occur because the proportion of female musicians has increased. In many respects, a surgical practice group (eg, academic department of surgery) is like an orchestra in that the absolute number of surgeons usually does not increase suddenly, unless there is a distinct increase in the patient population. With increasing numbers of female physicians and those choosing to pursue surgical training, it becomes incumbent to review the hiring and retention of women in surgery.

Gender diversity impacts not only the finances of many industries, but also the operations and services rendered; importantly, it has become a priority in health care [1, 5–8]. To better meet the needs of our patients and foster innovation, we need to ensure that the unique contributions of both male and female surgeons are valued. The intent of this article is to address gender diversity from the surgical perspective. Specifically, we explore the influence of the institution’s culture of safety, including leadership, quality of health care and patient outcomes, effect on surgical training, and physician well-being.

## Culture and Leadership

In general, women comprise a small proportion of all research investigators and health care providers. The disparity is more pronounced in academic medicine and especially in the surgical specialties [5, 7, 9–11]. To date, female surgical leadership rates remain low in U.S. medical schools. Of a total of 11,549 surgical faculty members in 2014, only 14.7% were women, comprising 19.4% of assistant professors, 13.8% of associate professors, and 7% of full professors [9]. Notably, just 3% of chairs of surgical departments in the United States are women, compared with nearly 14% in all clinical sciences

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[11]. In thoracic surgery, of the 745 academic faculty members in the United States, there are only 49 (6.6%) women [9]. It has been estimated that gender parity at the full professor level in surgery will not be achieved, without significant policy changes, for at least 100 years [12].

Studies suggest that equity (the quality of being fair and impartial) is not the main issue, but rather equality (the relationship between 2 entities being valued similarly) is. Women, on average, present at as many scientific conferences as men; their quality of scientific investigation is equivalent to, if not often surpassing, that of their male colleagues [4, 6, 7, 10, 13, 14]. While there may be fewer papers published by women, the number of citations and the impact of journals that publish these works exceed those of their male counterparts [7, 13, 15]. Notably, women's publication rates increase and surpass those of men in the later stages of careers, yet women hold fewer leadership positions [16].

In health care, the stakes of inequality regarding race, gender, ethnicity, or sexual preference are higher. Though outcomes may be theoretical in the discipline of science overall, in clinical care, the effects of inequality and cognitive biases have direct impact on patient safety. Although interventions have been proposed and implemented to improve gender and diversity in health care, the protracted nature and uneven uptake across health care systems have hampered progress in care team management, leadership, and the culture of safety [5, 17, 18]. Despite efforts directed at diversity, the terms *glass ceiling* and *sticky floors* are prevalent in many aspects of health care delivery, from recruiting the best medical students to cultivating and supporting the next generation of surgeons and academic leaders [7, 10, 12]. These terms imply that there are no obvious obstacles, but rather a countercurrent that makes it difficult for advancement of the affected group [7]. One can also argue that the barriers are obvious in many instances and not enough has been done to address them. Clearly, the glass ceiling and sticky floor exist in many businesses and industries; within health care, however, it has the potential to negatively impact the function of care teams in a collective, patient-centered unit.

Even with some progress toward gender diversity in the workforce, disparities in hiring and compensation have contributed to a disproportionately low number of female physicians achieving academic advancement [4-7, 10]. Female providers face other challenges, including imposter syndrome and unbalanced work-life integration [5, 10, 19]. Also prevalent is the idea of constant criticism, whereby female physicians are perceived to lack experience, as they may be younger in an environment in which men dominate selection and nomination committees [6, 20]. It has been proposed that if health care is to be truly team based and innovative, those in leadership positions must share traits that are commonly associated with women, such as creativity, collaboration, and empowerment. Ironically, the prevailing sentiment is that physicians that are more likely to be selected into leadership positions display traits typically associated with men, such as overconfidence, determination, and entitlement [20, 21].

In thoracic surgery, there has been modest progress relating to diversity. A recent report showed that a higher proportion of faculty in "top" cardiothoracic surgery centers obtained training abroad or at highly ranked U.S. institutions with a diverse faculty [22]. Yet, among these top centers, women surgeons represented only a small minority, at 7.3% [22]. While there is no substantive gender difference among the institutions studied, there is a slow, but appreciable, increase in female surgeons among the younger faculty.

## Patient Care

### *Provider Gender*

Differences in health care delivery by female physicians compared with male physicians have been identified, with the former demonstrating better performance on many metrics [4, 5, 23-26]. Female physicians are perceived as "more careful," with increased tendency to adhere to clinical guidelines, thereby being more likely to provide evidence-based care, and may be better communicators with patients and families [23, 24, 27]. These characteristics have been shown to positively impact outcomes, such as mortality and readmission rates [23, 24, 26-28]. Importantly, provider biases can influence the practice of medicine leading to variations in care, which provide the substrate for nonreliable and unsafe systems [27].

Specifically, female physicians tend to have longer (by an average of 2 minutes) and more engaging visits with patients than male physicians do [5, 23, 24]. Female physicians generally demonstrate more empathy toward their patients, who in turn tend to disclose more medical and psychosocial information and make more positive statements [5, 23, 24, 29-31]. The same-gender dyads amplify the effects of these interactions, and medical encounters between female physicians and female patients transcend national and cultural differences [32]. Also, female physicians more often provide preventive medicine and document more diagnoses from psychosocial etiologies than male physicians do [5, 33-35]. An example is the treatment of congestive heart failure, in which female physicians have been shown to follow guideline-recommended drug use and achieve target doses more often than male physicians do [25]. In surgery, however, while patient outcomes may be better when treated by older compared with younger surgeons, there appears to be no difference between the outcomes of female and male surgeons [36]. Based on Medicare claims data, elderly patients treated by female physicians tended to have lower 30-day mortality rates (11.07% versus 11.49%) and lower readmission rates (15.02% versus 15.57%) for all medical conditions compared with male physicians [26]. Because any differences in clinical care are small, more research is needed to confirm such results and identify the characteristics of both female and male physicians that are associated with improved outcomes and patient safety [5, 26]. Establishing a culture of safety that is sufficiently flexible to permit creativity, manage complexity, and encourage open leadership

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