



# Women in thoracic surgery: social media and the value of mentorship

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**Abstract:** Social media serves as a tool to fill gaps in current efforts to promote women in cardiothoracic surgery, and, given its global reach, may be a particularly effective modality. Social media has an important role in networking and mentorship, especially for women seeking careers in specialties with relatively sparse female representation, such as cardiothoracic surgery. In addition, social media may facilitate professional interactions, collaboration, growth of online reputations, engagement in continued education, communication of novel research findings, and patient education. Herein, we review the evidence for social media in the networking and mentorship of women in cardiothoracic surgery. Future studies are needed to establish the durability of social media efforts and predictors in its effectiveness in achieving its goals.

**Keywords:** Mentorship; thoracic surgery; social media; surgeons

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## Background

For the first time in 2017, the proportion of matriculating female medical students surpassed that of their male colleagues in the United States (1). However, despite these demographic shifts in the overall population of rising physicians, the proportion of practicing female physicians in the workforce still lags significantly behind that of males, particularly within surgical fields (2,3). This finding is in stark contrast to that observed within other specialties, such as pediatrics and obstetrics/gynecology, which attract significantly greater proportions of females, harboring a predominantly female workforce (4). Importantly, it has been established that females are no less successful in completing surgical training or entering the surgical workforce when compared to their male residency colleagues (5). While it will take decades for the population of practicing physicians to reflect this newly achieved

equilibrium of sexes in training, it remains concerning that surgical fields are failing to proportionately garner interest from highly qualified, talented female trainees.

This discrepancy is exceedingly apparent in the field of cardiothoracic surgery, with an extremely low percentage of practicing female physicians, far less than other surgical specialties, aside from orthopedic surgery (6). Despite a genuine welcoming from the current community of (largely male) cardiothoracic surgeons, as well as patients and families, the integration of women into the field of cardiothoracic surgery has been sluggish (7). However, organizations such as Women in Thoracic Surgery continue to promote the importance of female surgeons in the field, with international support and myriad opportunities for professional growth and development (8,9).

Nonetheless, factors contributing to the continued underrepresentation of women in this and other male-dominated surgical subspecialties are numerous and

complex (10). When considering surgical training, fears regarding sex-based discrimination are cited (11,12). Additionally, perceptions of environments which do not foster family planning and childbearing abound (13). Lastly, several investigations have identified the lack of exposure of female trainees to available female surgical mentors as a limiting factor preventing more women from entering the field (10,12,14). These issues, unfortunately, result in a self-perpetuating prophecy, wherein females do not opt for careers in cardiothoracic surgery because they do not find available role models.

Women are furthermore notably absent from leadership roles locally and at the national level. Women infrequently serve as departmental chairs or division chiefs, and leadership within regional and national organizations additionally lack adequate representation (15-18). In academics, a lesser proportion of women achieve full professorship compared to men, and principal investigators of research endeavors are less likely to be women, though promising trends have been noted (8,19).

In discussing the importance of mentorship, it is often stated that, “*You can’t be what you can’t see.*” Understandably, the value of mentorship, particularly same-sex mentorship for female trainees, has been increasingly appreciated (10,20,21). Though women seek these relationships in their early career developments, they often find it challenging to identify such mentors (22). Lacking minimal opportunities for mentorship locally, trainees and mentors alike have turned to novel avenues via social media to foster such relationship in the trajectory of professional development (23).

### Social media for surgeons

Social media encompasses a variety of online tools and communities, which augment learning, information sharing, and collaboration via expanded networks of novices and experts (24). In-person groups that were formerly small or challenging to identify are now readily accessible. Likewise, otherwise elusive expert opinions and research can be found nearly instantaneously in well-organized fora and communities. The routine, if not ubiquitous, use of smartphones has further promoted the quick and easy use of a variety of social media platforms available through mobile technology.

Increasingly, the value of social media for professional development has been recognized across all professions, although physicians and particularly surgeons have been a bit slower to adopt, citing concerns about patient privacy

and the informality of one’s virtual, versus in-person, presence (25,26). However, the value of these online tools continues to be touted across a variety of medical fields, providing opportunities for networking and learning for established experts, trainees, and patients alike. To this end, social media has “leveled the playing field” to a great extent—bringing fans closer to celebrities, readers nearer to authors, and students approaching experts.

For patients and families, social media not only has provided opportunities for information gathering regarding specific disease states; in addition, many have found comfort in virtual communities with others who share their diagnoses and with whom they might share experiences and questions (27-29). Particularly astute medical and surgical groups have used these virtual communities to observe and better understand the information gaps and coping mechanisms present in their patient populations; these findings have then been used to further guide the social support aspect of patient care (30,31). Additionally, one study found that over 25% of patients in a surgical practice had used social media to aid in their surgeon selection (32).

For those in the medical community, social media—particularly Twitter—has served as a platform for continued and expanded dialogue beyond breakroom fodder and routine journal clubs. An exemplary example has been the success of the Thoracic Surgery Social Media Network (TSSMN) (33,34). This collaborative virtual group formed by the joint efforts of *The Annals of Thoracic Surgery* and *The Journal of Thoracic and Cardiovascular Surgery* has 18 delegates and collectively over 53,000 followers. The TSSMN has been successful in bringing together medical professionals and trainees at all levels across the world for networking and dissemination of topical journal articles in the field of cardiothoracic surgery via TweetChat-based journal clubs (35). Additionally, recent results from a randomized trial demonstrated significantly improved Altmetric scores, Mendeley reads, and Twitter impressions when articles were tweeted versus control (non-tweeted), suggesting that this academic dialogue is impactful and long-lasting (36).

Importantly, the benefits of this digital forum are not limited to opportunities for scholarly discourse among learners and experts in the field of cardiothoracic surgery. Social media has additionally provided a much needed vehicle for women to share experiences and provide support in novel ways. Various blogs, such as those through the Association of Women Surgeons or Women in Thoracic Surgery, attract a great deal of internet traffic, with topics spanning all things

from professional to personal life (37). These postings often provide personal stories in a form that is more accessible and intimate than a formal meeting, while also offering the convenience of the ability to view at any time.

Social media has offered more avenues for honest and open dialogue, and it has further been a significant impetus in the changing face of surgery today. In a predominantly male-dominated field, in which aspiring young surgeons may not have access to female mentors, the notion that “*You can’t be what you can’t see*” again becomes germane. With many female students feeling discouraged by the lack of visibility (or simply lack entirely) of exemplarily female role models, movements such as #ILookLikeASurgeon have brought strong female faces and names to the forefront, offering trainees the opportunity to see themselves in such roles (20–22,38). This was followed by #NYerORCoverChallenge, the overwhelming response fueled by a cover of *The New Yorker*, in which the four faces of the surgical team looking down upon a patient were exclusively women (39). This social media movement brought women together across surgical fields, dissolving hierarchical relationships, in a communal excitement to change stereotypes and represent the amazing identity of women surgeons.

### Social media for networking, mentorship, and sponsorship

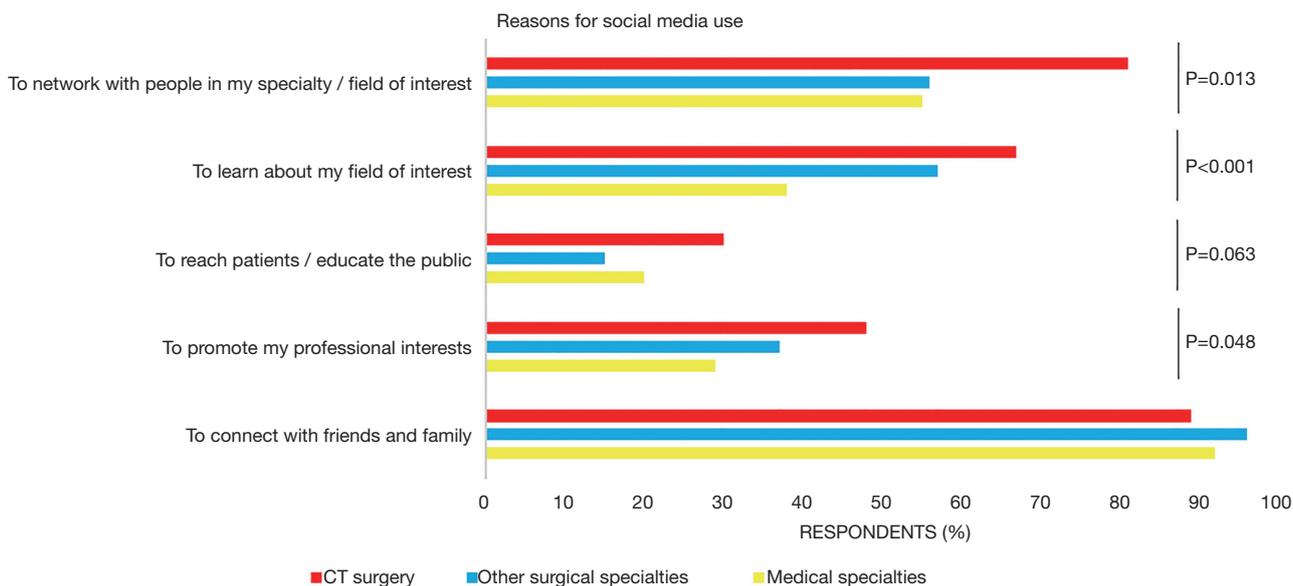
The importance of mentorship in the training of the next generation of surgeons is widely recognized. Effective mentorship has been reported to be associated with stress reduction, greater job satisfaction, confidence, research productivity, and promotion (40). A study to appraise mentorship in cardiothoracic surgical training demonstrated that 84% of cardiothoracic surgery residents had mentors, with the majority of respondents citing mentorship as critical to their success and career choice (41).

While women represent approximately half of graduating medical students, they continue to remain a minority in the surgical specialties, comprising 38% of surgical residents and less than 20% of full-time surgical faculty (21). Furthermore, this gender gap is more pronounced in surgical subspecialties such as cardiothoracic surgery, where women comprise of approximately 3% of total American Board of Thoracic Surgery certified diplomats and less than 5% of practicing cardiothoracic surgeons (8). Women in surgery often cite a lack of mentorship as a significant obstacle to career selection, progression, and satisfaction in the specialty (21,42,43), while valuing same-sex mentors as

role models who assist them in succeeding in personal and professional career paths (41,44).

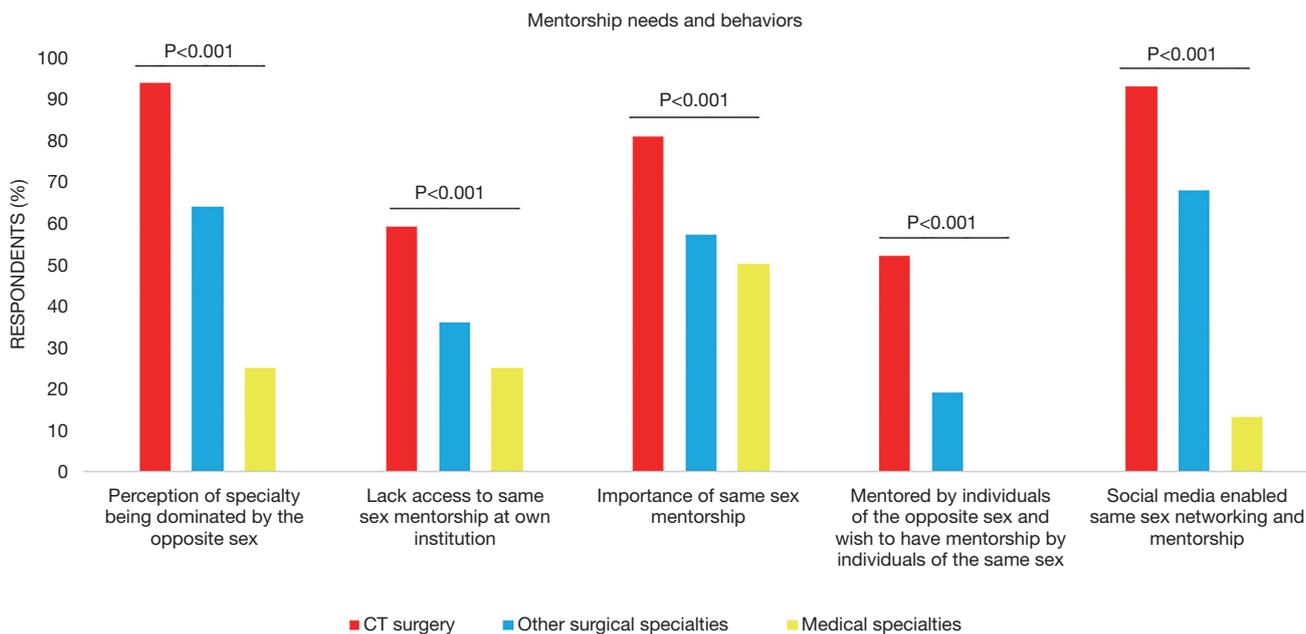
Social media allows for near instantaneous synchronous and asynchronous communication, breaking down the barriers of geography and time and can be a potent tool for not only networking and education, but also for promoting positive and diverse role models surgery (39). The #ILookLikeASurgeon (38), #NYerORCoverChallenge (39,45), and #HeForShe are examples of social media campaigns that have brought considerable attention to the role of women as surgeons and is changing stereotypes and highlighting the united community of surgeons (both women and men) in welcoming, educating, and supporting the future of surgery. In addition to increased awareness, social media can be a useful supplement to physician and trainee interactions, particularly for women in cardiothoracic surgery who may lack exposure to same-sex mentors at their own institution.

Although we do not yet have data to demonstrate that more women are entering surgical careers, specifically cardiothoracic surgery, as a result of social media engagement, prior literature has demonstrated the emerging role of social media for networking and mentorship. Previous studies published by our group in the *American Journal of Surgery* (44) and the *Seminars in Thoracic and Cardiovascular Surgery* (46) have aimed to address this question. We have shown in a survey of 282 respondents (44,46) that individuals in different specialties use social media differently (*Figure 1*) with those in cardiothoracic surgery more likely to use social media to network with people in their specialty, learn about their field of interest and to promote their professional interests. Compared to medical and other surgical subspecialties, women in cardiothoracic surgery were more likely to find their field dominated by the opposite sex (cardiothoracic surgery 94% *vs.* other surgical specialty 64% *vs.* medical specialty 25%,  $P < 0.001$ ) and lack access to same sex mentorship at their own institution (cardiothoracic surgery 59% *vs.* other surgical specialty 36% *vs.* medical specialty 25%,  $P < 0.001$ ), though desire same sex mentorship (cardiothoracic surgery 81% *vs.* other surgical specialty 57% *vs.* medical specialty 50%,  $P < 0.001$ ). Importantly, compared to medical specialties, women in surgical specialties were more likely to report that social media has allowed them to build a larger network of same-sex mentorship than they could have been able to achieve (cardiothoracic surgery 93% *vs.* other surgical specialty 68% *vs.* medical specialty 13%,  $P < 0.001$ ) (*Figure 2*). We have also provided data in regards



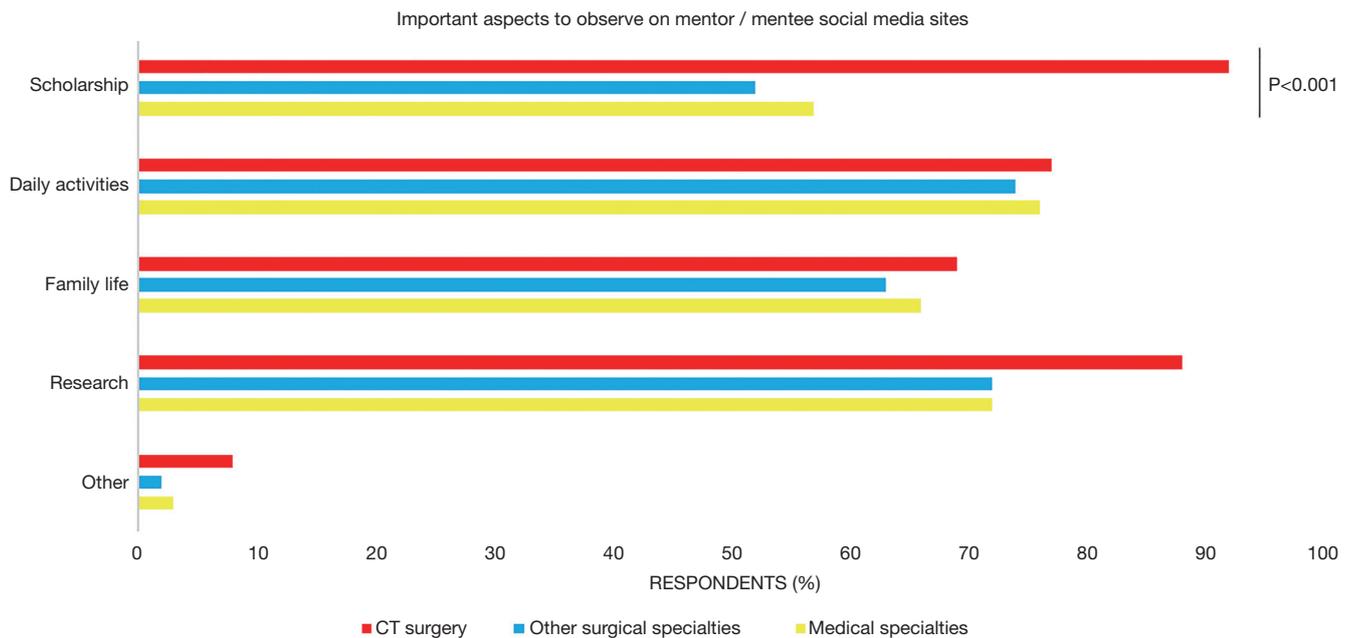
Figures adapted with permission from:  
 1. Luc JG, Stamp NL, Antonoff MB. American Journal of Surgery 2018  
 2. Luc JG, Stamp NL, Antonoff MB. Seminars in Thoracic and Cardiovascular Surgery 2018

**Figure 1** Reasons for social media use among medical and surgical specialties. CT, cardiothoracic.



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 1. Luc JG, Stamp NL, Antonoff MB. American Journal of Surgery 2018  
 2. Luc JG, Stamp NL, Antonoff MB. Seminars in Thoracic and Cardiovascular Surgery 2018

**Figure 2** Mentorship needs and behaviors of respondents in medical and surgical specialties. CT, cardiothoracic.



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1. Luc JG, Stamp NL, Antonoff MB. *American Journal of Surgery* 2018
2. Luc JG, Stamp NL, Antonoff MB. *Seminars in Thoracic and Cardiovascular Surgery* 2018

**Figure 3** Respondents ranking of important criteria regarding the content believed to be important on mentor/mentee social media sites. CT, cardiothoracic.

to important aspects sought on mentor/mentee social media sites (Figure 3).

It has been shown that a lack of sponsorship is keeping women from advancing in leadership in the business world (47,48) with women being over-mentored and under-sponsored (49). Social media can play a role in making connections for career advancement, even beyond mentorship, by becoming a modality by which one can build one's brand (24), advocate for issues of personal interest (50) as well as network, role model, and offer sponsorship to other individuals (44,46). We have shown that social media can allow for remote attendance of academic meetings, with The Society of Thoracic Surgeons setting the standard to allow for alternative means for women on medical and parental leave to contribute to meetings (51). Given the increased use of social media for live-tweeting meetings (52) and bridging surgical scholarship to Twitter (53,54) through TweetChats (55) and community support (56), the potential uses of social media to create further unique opportunities to support women are limitless.

Moreover, we have demonstrated in a bibliometric analysis of the *Annals of Thoracic Surgery* that there has

not only been a temporal trend towards improvement in female representation in authorship over the years, but, additionally, articles published by women were more likely to receive social media attention through Twitter (57). Social media attention has been shown to lead to higher article-level metrics (36) and citations in a recent prospective randomized controlled trial of tweeting articles through the Thoracic Surgery Social Media Network (58). Given that publications and citations were lower for women in surgical subspecialties compared to men and often cited as a potential barrier for promotion of women, this finding has particular relevance (17). Social media may provide a platform through which individuals can advocate and promote their work and the work of others, with specific utility for women to break the glass ceiling given, given that research productivity and impact are benchmarks of achievement often used as metrics for promotion in academic medicine (17).

### Looking toward the future

Social media is constantly evolving, and, as we look toward

the future, it is clear that the breadth, reach, and means of accessing social media will continue to change. While none of us has a crystal ball to predict the future, there are some expectations of how social media in the coming years may progress. While some of the predictions center around issues such as security, type of content (more videos), and less need for typing, some very likely forecasts emphasize the future role of mobile access (59). With more than 3 billion people in possession of mobile phones in 2020, it is clear that even busy surgeons will have greater ability to be engaged on such platforms along with the rest of the world's growing social media savvy population (59).

Given social media's broad reach and rapidly increasing potential for privacy and professionalism breaches, organizational bodies including the American Medical Association (60), American College of Surgeons (61) and the Cardiothoracic Ethics Forum comprised of membership of the American Association for Thoracic Surgery Ethics Committee and The Society of Thoracic Surgeons Standards and Ethics Committee (62,63) have published guidelines for ethical standards and use of social media for physicians and surgeons. Such guidelines will be especially emphasized as we consider the future roles of social media in our profession.

In addition, as the role of social media changes, we will see simultaneous progression of women in surgery. It is critical to recognize that, in consideration of the gender gap in medicine, the playing field has still not been leveled (64). Complete gender parity may not be necessary to change culture, as it is believed that when 20–30% of a group is comprised of women, their voices begin to be heard (65). Fortunately, despite the fact that women only comprise about 5% of our workforce, we do expect that, with time, we will reach a critical mass, and, perhaps, the need for external same-sex mentors will become de-emphasized. However, with the parallel growths in social media and digital networking, it is likely that such means of interaction will still be important components of rounding out one's armamentarium of mentors and sponsors, even if for reasons other than finding networks of role models and colleagues of the same gender.

## Conclusions

Social media has an important role in networking and mentorship, particularly for women in cardiothoracic surgery. In addition, social media can facilitate professional interactions, collaboration, development of online

reputations, engagement in continued education, dissemination of new research findings, and public education. The utility of social media is wide and its effects far-reaching. Future studies are needed to establish the durability of social media and predictors in its effectiveness in achieving its goals.

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