



# PROPEL: *A Look Ahead*

**PROPEL**

*PROFESSIONAL RESOURCE  
OPPORTUNITIES IN PLASTIC  
AND RECONSTRUCTIVE SURGERY  
EDUCATION AND LEADERSHIP*



**Dear PROPEL Participants,**

Congratulations on acceptance into the PROPEL (Professional Resource Opportunities in Plastic and Reconstructive Surgery Education and Leadership) Program. We are looking forward to seeing your progress as teams work together throughout the year. Your team is composed of members from a variety of different backgrounds who have been matched according to interests and goals. While the program is successful from the perspective of the mentor-mentee relationships that are built, we also know that it can be challenging to find time to meet and topics to discuss. To assist with that, this syllabus can serve as a guide for suggested meeting times and potential topics and articles to discuss. This resource was created by trainees and faculty together to account for a diverse set of needs and ideas. Throughout this year, please feel free to contact us if there is anything we can do to make this process more efficient, organized and, most importantly, meaningful for you. Thank you for your participation in this program.

Sincerely,

**The PROPEL Work Group**

*Mamtha Raj, MD*

*Niki K. Patel, MD*

*Kavitha Ranganathan, MD*

*Angela Oswald, ASPS Membership Liaison*

# TABLE OF CONTENTS



Frequently Asked Questions .....	4
<b>Quarter 1: Evolving Mentorship: Lessons from the Past, Insights for the Future</b> (Months 1-3)	
<i>Objectives and Guided Discussion Questions</i> .....	6
<i>Mentorship: A Pathway to Succeed in Plastic Surgery</i> .....	7
<i>Mentorship in Plastic Surgery: A Systematic Review of the Current Literature and Elucidation of Recurring Theme</i> .....	10
<b>Quarter 2: Building Meaningful Mentorship: From Connection to Collaboration</b> (Months 4-6)	
<i>Objectives and Guided Discussion Questions</i> .....	19
<i>The Less Emphasized Link in Mentorship: The Role of the Mentee</i> .....	20
<i>Surgical Mentorship for Next Generation Is Changing</i> .....	23
<b>Quarter 3: Modern Mentorship in Plastic Surgery: Adapting in an Evolving Field</b> (Months 7-9)	
<i>Objectives and Guided Discussion Questions</i> .....	33
<i>'Virtual Mentorship is a No-Brainer': The Application of a Virtual Mentorship Programme for Prospective Plastic Surgery Trainees</i> .....	34
<i>Leveraging social media for mentorship in surgery</i> .....	44
<b>Quarter 4: Mentorship as Sponsorship: Moving from Guidance to Advocacy</b> (Months 10-12)	
<i>Objectives and Guided Discussion Questions</i> .....	47
<i>Maximizing Your Plastic Surgery Training: Professional Society Career Development Opportunities for Students, Residents, and Fellows</i> .....	48
<i>Inclusive Mentorship and Sponsorship</i> .....	64



## PROPEL Frequently Asked Questions:

### **1. What is the goal of PROPEL?**

In an effort to restructure and enhance mentorship in Plastic Surgery, ASPS designed a program called PROPEL (Professional Resource Opportunities in Plastic and Reconstructive Surgery Education and Leadership). Launch teams were created as part of this approach to mentorship and collaboration in the specialty. Teams are composed of members from a variety of different backgrounds and experience levels so that team members may have the opportunity to serve as a mentor or mentee. The goal of each group is to build relationships and create a continuum of learning opportunities that reflects the vast, yet overlapping experiences between faculty members and trainees in a longitudinal fashion.

### **2. How were the teams formed?**

The goal is for each team to be composed of a spectrum of members with varying backgrounds and levels of experience. These teams have been carefully curated based on the preferences submitted by each member in order to align the interests of all members of the group. The goal is for everyone to have the opportunity to serve as both a mentor and mentee. For example, while a faculty member may be a mentor to residents, they may receive mentorship from another faculty member in the group. Each resident may have the opportunity to mentor a more junior resident as well as receive mentorship from a faculty member.

### **3. How often should our team meet, and what should be discussed?**

This program is very flexible and is designed so that each team can operate in a way that is most beneficial to those team members involved. However, we do require that you meet once per quarter. Reminders and discussion materials will be sent out periodically, but feel free to discuss anything that would be helpful for those in the group and utilize each other's expertise as this program is focused on mentorship!

A general suggestion for meeting would be to touch base for 30-40 minutes every 3 months and below is a sample outline of possible topics to cover:

- 1) Background of each team member
  - a. Personal
  - b. Professional - Current position and practice environment
- 2) Career Goals
  - a. Personal
  - b. Professional
- 3) Barriers/Challenges to career goals
  - a. Personal barriers
  - b. Professional barriers
- 4) Means to overcome barriers to career goals
  - a. Personal
  - b. Professional
- 5) How can the PROPEL team members help one another to achieve these goals?



---

#### **4. What tools are recommended to use to set up and conduct a team meeting?**

There are several ways a group can communicate to set up and conduct a team meeting. In addition to relying on email correspondence, below are a few suggestions for free programs that may be more useful to schedule a time that works for everyone conduct the meeting.

- A. Doodle Poll** – You can choose to create a free account (there are also upgraded paid account options as well) in which you can send a poll to your teammates. We recommend sending 2-3 options to keep it simple and everyone can select the option(s) that work best for them. It may also be helpful to determine in advance whether daytime, evenings or weekends work best for those on your team or include both options in your Doodle Poll.
- B. Survey Monkey** – There are free accounts available within Survey Monkey as well. You can set up the free account (upgraded paid accounts are available as well, but not needed for this purpose) and then create a brief survey for any questions you would like your teammates to answer. This could be to identify certain interests, time of day availability for meetings or goals for what they would like to accomplish through this program.
- C. Zoom** – Zoom is a great tool used by a lot of organizations and individuals for face-to-face interaction when meeting virtually. Zoom offers a basic account option, which is free. It provides an easy way to set up a meeting and send the applicable link to join the meeting at the chosen time. The basic account does have a time limit of 40 minutes. However, we would advise that you conduct shorter meetings on a more frequent basis rather than meet for an extended period of time. With everyone's busy schedules, it may be easier for everyone to attend meetings if they are shorter in duration. Otherwise, some team members may already have a paid account without a time limit, or everyone can also rejoin the same link after the 40-minute expiration to continue if additional time is needed for the meeting.
- D. FaceTime** – If those in your group have Apple devices, FaceTime may be an available option and easier to manage for some.
- E. Google Hangouts** – This is another platform that can be used on various devices, rather than just Apple, for messages, voice calls and video calls.
- F. WhatsApp** – This is a free app you can download on your device and can be utilized for things like text messaging and video calls. It's especially helpful for teams that have international members as it's a free app available all over the world.



**FIRST QUARTER** (Months 1-3)  
**Evolving Mentorship: Lessons from the Past,  
Insights for the Future**

**Objectives:**

- Reflect on how mentorship has shaped careers historically and presently in plastic surgery.
- Identify gaps and opportunities to improve mentorship programs.
- Inspire forward-thinking approaches for mentees and mentors alike.

**Articles:**

- Mentorship: A Pathway to Succeed in Plastic Surgery
- Mentorship in Plastic Surgery: A Systematic Review of the Current Literature and Elucidation of Recurring Theme

**Guided Discussion Questions:**

**Past:**

- What forms of mentorship did your mentors receive during their training?
- Do you feel you had adequate mentorship or access to multiple mentor types?
- How did mentorship (or lack thereof) influence career decisions and leadership opportunities?

**Present:**

- How do current trainees perceive mentorship opportunities?
- What mentorship models (formal, informal, peer, group) have been most impactful for you?
- How has guidance from current mentors shaped your career trajectory?

**Future:**

- What improvements or innovations could strengthen mentorship in plastic surgery?
- How could PROPEL or other programs better support mentor-mentee relationships in the coming years?

# Mentorship: A Pathway to Succeed in Plastic Surgery

Smita R. Ramanadham, M.D.  
Rod J. Rohrich, M.D.  
*Boston, Mass.; and Dallas, Texas*

If I have seen further it is by standing on the shoulders of giants.

—Isaac Newton

**A**s young faculty in the early years of my career at an academic institution, I find myself reflecting on my career choices and what the future holds. What are my short-term and long-term goals and plans? Do they fit with what I want to do in my private and professional life? Am I currently fulfilled in my career? These are questions that we must all answer after honest self-reflection. Although, ideally, the answers should be yes, this is often not the case. This results in many becoming discouraged and unhappy; we leave our current jobs to look for better opportunities; we leave academics altogether. Attrition rates in academia subsequently remain high, and we must address this. We must first answer for ourselves why we have chosen our profession and ensure that our goals align with the job we have chosen. Is it for the prestige, the money, or the job stability, or is it to give back, teach the next generation of surgeons, and provide the best care for our patients? For the senior author, the primary goals have been to be a good doctor and give back, teach the next generation of plastic surgery leaders, continue to improve and impact medicine, and family. That is my goal as well. The answer, however, is different for us all, but the template is similar. Be a good doctor first, give back, be and do your best, and do not be afraid to challenge yourself.

Do we need help along this path? Yes! That is the vital role of life mentors and plastic surgery mentors. Often, they are not the same. I would argue that with appropriate mentorship for junior

faculty, we can address the problems of job dissatisfaction and attrition. We are very good at providing mentorship to our students and residents, but what happens after? Are we doing a good job at mentoring our young junior faculty or have we failed? Do we prepare plastic surgeons for the business and academic aspect of plastic surgery today? The answer is—it depends! It depends on your mentor, your training, and your mindset to learn these fundamental aspects that are key to success in plastic surgery. We often forget that, as physicians, we have an obligation to give back and teach the next generation so they can be better than we were. We can and must do better!

## IMPORTANCE OF MENTORS

As stated by Rohrich, we must train at the “feet of masters.”<sup>1</sup> Mentorship is key to professional development. Mentors provide advice, guidance, and support, fostering qualities that enable a successful career and improve retention.<sup>2</sup> Mentorship increases productivity, career advancement, research, and grant funding, and decreases burn-out compared with nonmentored peers.<sup>3,4</sup> Mentees, in addition, report higher job satisfaction.<sup>3</sup> Furthermore, mentors benefit also as they pass on their talents and skills to the next generation.<sup>3</sup>

Mentorship is important throughout our training and contributes to the success of our profession.<sup>4</sup> Eighty percent of recent medical school graduates reported that their mentors influenced their decision to pursue plastic surgery; 40 percent wanted a practice similar to their mentor’s.<sup>4</sup>

*From the Division of Plastic and Reconstructive Surgery, Boston University School of Medicine; and the Dallas Plastic Surgery Institute.*

*Received for publication May 24, 2018; accepted July 12, 2018.*

*Copyright © 2018 by the American Society of Plastic Surgeons*

*DOI: 10.1097/PRS.0000000000005134*

**Disclosure:** *Dr. Ramanadham has no disclosures pertaining to the content of this Editorial. Dr. Rohrich is a Clinical and Research Expert for Allergan and the Musculotransplantation Foundation. He receives instrument royalties from Eriem Surgical, Inc., and book royalties from Thieme Publishing. Business concern includes Medical Seminars of Texas, LLC. No funding was received for this Editorial.*

They were also more likely to become academic surgeons according to a survey by DeLong et al.<sup>5</sup> Mentorship, however, becomes less formal once training is complete, as 19 to 84 percent of clinical faculty reported working with a mentor.<sup>6</sup> This is concerning given the data showing its importance and the high attrition rates seen in academic medicine among faculty.

### **HIGH ATTRITION RATES**

A survey of academic physicians shows that 14 percent considered leaving within 1 year, whereas 21 percent considered leaving academics altogether because of dissatisfaction.<sup>7</sup> In plastic surgery, specifically, only 27 percent of graduates enter academic practice, and an astonishing 40 percent depart within 5 years.<sup>8</sup> In a survey performed in 2012, burnout, lack of mentorship, and difficulty with work-life balance were the most important predictors of attrition.<sup>8</sup> Inadequate mentorship was noted in 43 percent of respondents in another survey, with the percentage of faculty considering leaving higher in this group.<sup>9</sup> Rates of attrition are, unfortunately, higher in female and ethnic minority groups.<sup>8,10</sup> A survey of American College of Surgeons members noted that 10 to 20 percent of surgeons consider leaving academia, with women assistant professors contemplating this more commonly.<sup>11</sup>

### **WOMEN IN ACADEMIA**

Women now constitute 50 percent of matriculating medical students, 37 percent of plastic surgery trainees, and 14 percent of board-certified plastic surgeons.<sup>12</sup> In fact, plastic surgery maintains the highest percentage of women academicians.<sup>13</sup> Although they are more likely to take academic positions, they, on average, tend to be younger and remain at the assistant professor level compared with their male counterparts.<sup>14</sup> Women are less likely to be promoted or hold tenure positions, more likely to abandon academics altogether, and reported lower professional satisfaction.<sup>10,12</sup> This has been attributed to work culture, barriers to research, lack of engagement, work-life balance, low salary, and poor mentorship and leadership.<sup>7,10,15,16</sup> Women remain underrepresented in leadership positions, with 7 percent of plastic surgery chiefs and chairs being female.<sup>10,15</sup> There is, consequently, a paucity of female mentors in leadership positions. In a survey performed by Janis and Barker, the majority of mentors were men older than 50 years.<sup>17</sup> Same-gender mentors

are vital, as women are less likely to seek advice from men regarding gender-related issues, and are less likely to pursue surgery because of a lack of female co-workers and role models.<sup>15</sup> Female role models have, in addition, been shown to be the most influential factor for female students interested in surgery.<sup>13</sup>

### **RETENTION RATES AND MENTORSHIP**

An integral part of a successful teaching hospital is the retention of talented faculty. Replacing these surgeons is considerably more costly.<sup>10,18</sup> Therefore, we need to stress mentorship especially among young women. A survey conducted at the University of Michigan Medical School reported that faculty with mentors were significantly more satisfied with their job.<sup>19</sup>

There are data that mentorship programs can improve retention, as seen at the University of California San Diego, whose faculty were more likely to participate in other leadership and professional activities.<sup>18</sup> Other institutions, such as the University of Toronto, developed formal career development programs and noted advancement of faculty, whereas the University of Virginia noted increased morale. Formal mentorship correlated with increased productivity and faculty retention.<sup>10</sup> It is a vital tool that should be supported by institutions to help recruit and retain talented plastic surgeons.<sup>18</sup>

Given the importance of mentorship for junior faculty, we must be proactive and seek it out at our own institutions, through professional societies or various networking events. For women specifically, we must be our own advocates, learn to ask for what we want, have confidence in ourselves, and overcome the “confidence gap” that, unfortunately, exists.<sup>15,20</sup> In doing so, we can generate excellence in ourselves and in our female colleagues, and together overcome the “glass ceiling effect” that exists.<sup>15</sup> The future of our profession relies on this. Although there are many factors involved in job satisfaction, the data are clear, mentorship is vital to faculty success and retention, and we must provide this to our young junior faculty. In addition, we must assess our personal goals and priorities and internally define what success is for us. Only then can we achieve personal and professional satisfaction.<sup>21</sup> As for me, I have been so privileged to have trained in an institution where I was able to create mentor-mentee relationships with true masters in plastic surgery. They not only have been my strongest advocates but have taken a vested interest in my personal and professional growth.

Going forward, we can no longer have mentorship occur in happenstance, especially with the expanding ethnic diversity and the increasing number of women in our field. We have not done a good job historically in preparing these groups for the rapidly changing environment of medicine. In addition, we need to have specific Residency Review Committee mandates and curriculum to provide a template for ongoing mentorship and learning. This needs to be stressed more at the academic level by making it an achievement and standard for promotion or advancement in both hospital and academic institutions.

The delicate balance of mentoring someone is not creating them in your own image, but giving them the opportunity to create themselves.

—Steven Spielberg

**Smita R. Ramanadham, M.D.**  
 SR Plastic Surgery PC  
 East Brunswick, N.J. 08816  
 smitar2280md@gmail.com  
 Instagram: dr.smita.ramanadham  
 Twitter: @SRamanadhamMD  
 Facebook: Smita Ramanadham, MD

## REFERENCES

- Rohrich RJ. I want my trophy: Setting expectations for life. *Plast Reconstr Surg.* 2007;119:1363–1364.
- Kashiwagi DT, Varkey P, Cook DA. Mentoring programs for physicians in academic medicine: A systematic review. *Acad Med.* 2013;88:1029–1037.
- Franzblau LE, Kotsis SV, Chung KC. Mentorship: Concepts and application to plastic surgery training programs. *Plast Reconstr Surg.* 2013;131:837e–843e.
- Barker JC, Rendon J, Janis JE. Medical student mentorship in plastic surgery: The mentee's perspective. *Plast Reconstr Surg.* 2016;137:1934–1942.
- DeLong MR, Hughes DB, Tandon VJ, Choi BD, Zenn MR. Factors influencing fellowship selection, career trajectory, and academic productivity among plastic surgeons. *Plast Reconstr Surg.* 2014;133:730–736.
- Goldwyn RM. "If you were beginning your career...". *Plast Reconstr Surg.* 2004;114:587–589.
- Pololi LH, Krupat E, Civian JT, Ash AS, Brennan RT. Why are a quarter of faculty considering leaving academic medicine? A study of their perceptions of institutional culture and intentions to leave at 26 representative U.S. medical schools. *Acad Med.* 2012;87:859–869.
- Waljee JF, Chung KC. Discussion: Academic plastic surgery: Faculty recruitment and retention. *Plast Reconstr Surg.* 2014;133:405e–407e.
- Pololi LH, Evans AT, Civian JT, et al. Mentoring faculty: A US national survey of its adequacy and linkage to culture in academic health centers. *J Contin Educ Health Prof.* 2015;35:176–184.
- Waljee JF, Chang KW, Kim HM, et al. Gender disparities in academic practice. *Plast Reconstr Surg.* 2015;136:380e–387e.
- Schroen AT, Brownstein MR, Sheldon GF. Women in academic general surgery. *Acad Med.* 2004;79:310–318.
- Furnas HJ, Johnson DJ, Bajaj AK, Kalliainen L, Rohrich RJ. Women and men in plastic surgery: How they differ and why it matters. *Plast Reconstr Surg.* 2016;138:743–745.
- Plana NM, Khouri KS, Motosko CC, et al. The evolving presence of women in academic plastic surgery: A study of the past 40 years. *Plast Reconstr Surg.* 2018;141:1304–1310.
- Last KM, Kuzon WM, Edelman EE, Waljee JF. Influence of training institution on academic affiliation and productivity among plastic surgery faculty in the United States. *Plast Reconstr Surg.* 2014;134:570–578.
- Silva AK, Preminger A, Slezak S, Phillips LG, Johnson DJ. Melting the plastic ceiling: Overcoming obstacles to foster leadership in women plastic surgeons. *Plast Reconstr Surg.* 2016;138:721–729.
- Cropsey KL, Masho SW, Shiang R, Sikka V, Kornstein SG, Hampton CL; Committee on the Status of Women and Minorities, Virginia Commonwealth University School of Medicine, Medical College of Virginia Campus. Why do faculty leave? Reasons for attrition of women and minority faculty from a medical school: Four-year results. *J Womens Health (Larchmt.)* 2008;17:1111–1118.
- Janis JE, Barker JC. Medical student mentorship in plastic surgery: The mentor's perspective. *Plast Reconstr Surg.* 2016;138:925e–935e.
- Chen JT, Giroto JA, Kitzmiller WJ, et al. Academic plastic surgery: Faculty recruitment and retention. *Plast Reconstr Surg.* 2014;133:393e–404e.
- Chung KC, Song JW, Kim HM, et al. Predictors of job satisfaction among academic faculty members: Do instructional and clinical staff differ? *Med Educ.* 2010;44:985–995.
- Rohrich RJ. #Giving Back: Why it matters! *Plast Reconstr Surg.* 2017;139:1275–1277.
- Shah AR, Haws MJ, Kalliainen LK. Factors affecting women's success in academic and private practice plastic surgery. *Plast Reconstr Surg.* 2018;141:1063–1070.

# Mentorship in Plastic Surgery: A Systematic Review of the Current Literature and Elucidation of Recurring Themes

Benjamin K. Stone, MSc\*  
Theodore A. Kung, MD†  
Turkia Abbed, MD, FACS‡  
Ines Lin, MD§  
Vinay Rao, MD, MPH¶

**Background:** Mentorship is an integral part of developing competent, passionate, and successful plastic surgeons and is an important element of surgeons' wellness. Although mentorship programs have been described in the literature, this study aimed to elucidate the specific qualities of an effective mentor in plastic surgery.

**Methods:** Preferred Reporting Items for Systematic Reviews and Meta-analyses methodology was utilized to conduct a systematic review of the literature. A search of 3 electronic databases (PubMed including MEDLINE, Embase, and Cochrane Library) was performed for relevant studies up to June 15, 2024, using an advanced search for article titles and abstracts pertaining to plastic surgery and mentorship. Eligibility criteria included primary sources that explicitly commented on the qualities of an effective mentor in plastic surgery. A risk of bias assessment was performed using Joanna Briggs Institute critical appraisal checklists.

**Results:** A total of 284 records were identified. After screening, the final sample contained 8 records. Conserved themes across studies included "time investment and accessibility" and "shared identities." Effective mentors foster leadership, guide and teach mentees, and maintain accessibility. Underrepresented groups are more likely to publish with race-concordant mentors, and female mentees prioritize mentor-mentee concordance more than male mentees.

**Conclusions:** Effective mentors are accessible to their mentees and invest time in developing their personal and professional goals. Identity concordances, such as shared values or shared life experiences, may be important in sustaining strong mentor-mentee relationships. The mentorship literature in plastic surgery would benefit from additional primary studies to better optimize mentorship programs. (*Plast Reconstr Surg Glob Open* 2025; 13:e6444; doi: [10.1097/GOX.0000000000006444](https://doi.org/10.1097/GOX.0000000000006444); Published online 29 January 2025.)

## INTRODUCTION

Effective mentorship in plastic surgery is critical to producing the next generation of competent, passionate,

and successful surgeons. Mentorship has the potential to be transformative to mentees across all levels of training from medical school through residency. Determining what qualifies as mentorship is challenging. Henry-Noel et al<sup>1</sup> defined "mentorship" as a 2-way relationship and type of human development in which one individual invests personal knowledge, energy, and time to help another individual grow and develop and improve to become the best and most successful they can be. The authors of this review agree with this definition, with the addition that mentorship is dynamic and evolves over the stages of one's career.

Finding effective mentorship is not without its obstacles and pitfalls. For example, leadership in plastic surgery lacks diversity. Leaders are statistically more likely to be White and male, and in 2022, less than 20% of plastic surgery program directors were women.<sup>2-4</sup> The percentage of underrepresented residents remains exceedingly low.<sup>5</sup>

Although plastic surgeons are reported to have some of the highest levels of career satisfaction, the prevalence

From the \*Division of Plastic and Reconstructive Surgery, The Warren Alpert Medical School of Brown University, Providence, RI; †Section of Plastic and Reconstructive Surgery, University of Michigan, Ann Arbor, MI; ‡Division of Plastic, Reconstructive and Cosmetic Surgery, University of Illinois, Chicago, IL; §Division of Plastic Surgery, Department of Surgery, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA; and ¶Department of Orthopedics, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA.

Received for publication June 30, 2024; accepted November 1, 2024.

Copyright © 2025 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal. DOI: [10.1097/GOX.0000000000006444](https://doi.org/10.1097/GOX.0000000000006444)

Disclosure statements are at the end of this article, following the correspondence information.

of emotional exhaustion and burnout among plastic surgeons, particularly residents, remains significant.<sup>6</sup> Mentorship is a key element of wellness and has been described as protective against burnout for practicing surgeons, and wellness programs in residency are often structured with a mentorship component.<sup>7,8</sup> Mentorship during the height of the COVID-19 pandemic became especially important, and consequently, telementoring rose to prominence,<sup>9</sup> and wellness was integrated into mentorship meetings.<sup>10</sup> However, in surveys of residents, mentorship continues to be an area of weakness in training.<sup>11,12</sup>

The surgical literature has described the dynamics of mentor-mentee relationships. Successful mentorship requires active investment and shared responsibility, whereas barriers to success include time constraints, lack of diverse mentors, and ethical issues such as mentoring abuse.<sup>13-17</sup> In surgical subspecialties such as orthopedics, “access” and “finding common time” remain as challenges to establishing mentorship.<sup>18</sup> Surgical trainees have indicated that their decision to pursue a subspecialty is most influenced by mentor characteristics of “demonstrating expertise,” “being a role model,” and “practicing professional integrity.”<sup>19</sup> Mentorship and leadership are inextricably linked, and the available literature on leadership in plastic surgery identifies cardinal characteristics and behaviors of an effective leader, such as “consistency,” “integrity,” and “giving recognition.”<sup>20</sup> The development of strong leadership skills is valued from the trainee perspective, as residents have demonstrated interest in structured curricula geared toward learning ethics, professionalism, and leadership.<sup>21,22</sup> A perceived deficiency in the number of mentors has been highlighted as an obstacle to teaching professionalism as reported by plastic surgeons.<sup>23</sup>

Given the critical importance of mentorship in plastic surgery, identifying key characteristics in an effective mentor can help both prospective mentors and mentees alike in their pursuit of productive mentor relationships. Although previous reviews have examined key components of mentorship programs,<sup>24</sup> the authors of this study sought to examine the qualities of the mentors themselves. This systematic review aimed to elucidate recurring, conserved themes in the plastic surgery mentorship literature across all stages of trainee education to better understand which specific qualities are requisite for an effective plastic surgeon mentor. Although earlier review articles have presented characteristics of an ideal mentor from the broader medical literature,<sup>25</sup> this study is the first systematic review that specifically examines the plastic surgery literature to elucidate the personal characteristics, qualities, and attributes in an effective mentor.

## METHODS

### Systematic Review of Mentorship in the Surgical Literature

Preferred Reporting Items for Systematic Reviews and Meta-analyses<sup>26</sup> methodology was utilized to conduct a systematic review of the literature (Fig. 1). A search of 3 electronic databases (PubMed including MEDLINE, Embase, and Cochrane Library) was conducted for relevant studies

## Takeaways

**Question:** What qualities are associated with effective mentors in plastic surgery?

**Findings:** We performed a systematic review of the literature on mentorship in plastic surgery and identified 8 records with recurring themes including “time investment and accessibility” and “shared identities.”

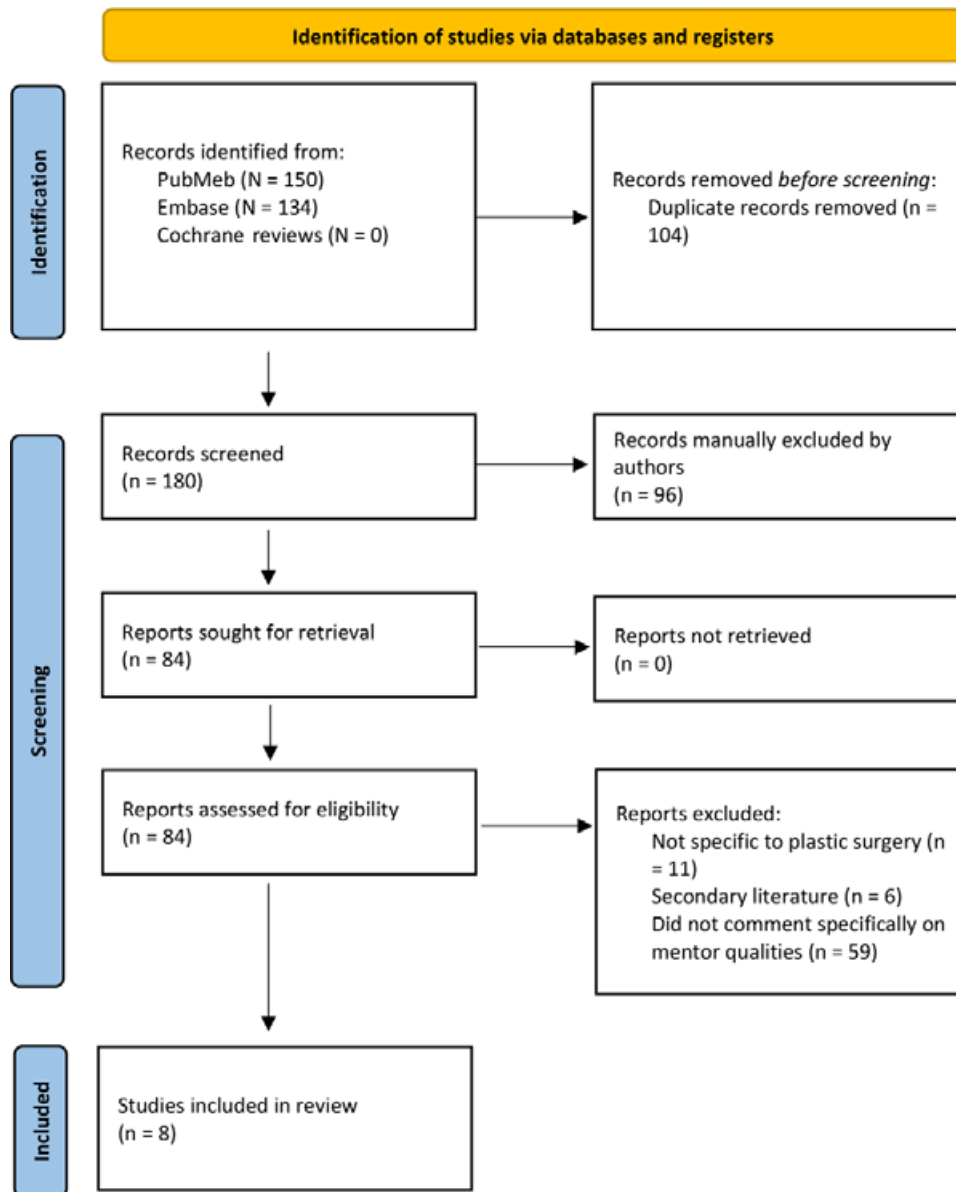
**Meaning:** Effective mentors invest time in developing the personal and professional goals of their mentees and may benefit their mentees if they share similar backgrounds or identities.

up to June 15, 2024, using advanced search for article titles and abstracts containing the following search inputs: PubMed including MEDLINE: (“plastic surgery”[Title/Abstract] operating room [OR] “plastic and reconstructive surgery”[Title/Abstract]) AND (mentorship[Title/Abstract] OR mentor[Title/Abstract] OR mentors[Title/Abstract] OR mentoring[Title/Abstract]): 150 results. Embase: (“plastic surgery”:ab,ti OR ‘plastic and reconstructive surgery’:ab,ti) AND (mentorship:ab,ti OR mentor:ab,ti OR mentors:ab,ti OR mentoring:ab,ti): 134 results. Cochrane Reviews: (“plastic surgery” OR “plastic and reconstructive surgery”) AND (mentorship OR mentor OR mentors OR mentoring): 0 results.

A total of 284 records were identified from the aforementioned databases. Duplicates (n = 104) were removed. The remaining 180 nonduplicate records were screened for inclusion based on title and abstract. Eligibility criteria for inclusion of records in a first-pass review included specificity to the field of plastic and reconstructive surgery and reference to mentor qualities or mentorship in the context of residency program attributes, educational advancement, or diversity. A total of 96 records were excluded. Examples of excluded records included nonspecific references of mentorship in procedure outcomes and Mentor model breast implants, which were inadvertently captured by the database search inputs. The remaining 84 records underwent full-text review to identify and include primary sources that explicitly commented on the qualities of an effective mentor in plastic surgery. Secondary sources were removed unless these records fell into the category of commentary pieces that described the qualities of an effective mentor, such as tributes to luminary mentors in the field of plastic surgery. The Joanna Briggs Institute “critical appraisal checklist for analytical cross-sectional study,” “critical appraisal checklist for qualitative research,” and “critical appraisal checklist for textual evidence: narrative” were utilized for risk of bias assessment.<sup>28-33</sup>

## RESULTS

The final sample contained 8 records. These 8 records were reviewed, and the mentorship qualities reported in the records were highlighted. Four records were quantitative primary articles, and 1 record was a qualitative primary article. Three records were commentary pieces. Characteristics of strong mentors were identified from the



**Fig. 1.** A flowchart depiction of the systematic review selection process following Preferred Reporting Items for Systematic reviews and Meta-analyses guidelines for the selection of articles in this study.<sup>27</sup>

mentee and mentor standpoint and consisted of character traits as well as leadership techniques (Table 1). A risk of bias assessment was performed with the generation of a traffic light plot (Fig. 2).

#### Mentor Characteristics

The primary studies (n = 5) and commentary pieces (n = 3) yielded recurring qualities in effective mentors that were largely grouped under the umbrellas of “time investment and accessibility” and “shared identities.”

#### Time Investment and Accessibility

Barker et al<sup>34</sup> analyzed recently matched postgraduate year 1 residents (mentees) to gauge their assessment of the value of types of interactions between mentor and

mentee as well as mentor characteristics and attributes. Characteristics that were deemed high value included genuine interest in career and personal development and willingness to set time aside for teaching. Janes et al<sup>36</sup> echoed this sentiment in a qualitative study of mentors themselves, reporting that successful mentors demonstrate a pattern of guiding mentees to become leaders and promote mentees nationally, encourage mentees to find what they are passionate about and lead by example. Stuzin<sup>41</sup> and Bill and Woods<sup>39</sup> consistently lauded mentor luminaries in the field for being caring, compassionate, accessible to mentees, and empowering mentees to become leaders in the field of plastic surgery, and touched on the large-scale influence that Dr. Henry Kawamoto and Dr. Richard Edlich had on their trainees. Stuzin<sup>41</sup> commented on the

**Table 1. Qualities of Mentors Described in the Plastic Surgery Mentorship Literature**

Primary Articles		
Authorship	Type of Article and Abbreviated Methods and Characteristics	Findings
Barker et al <sup>34</sup>	<p>Primary article</p> <p>An electronic survey was sent to recently matched PGY-1 integrated track residents in 2014 (response rate: 76%, 103 of 136 PGY-1 residents).</p> <p>The survey consisted of 5 questions that included:</p> <ol style="list-style-type: none"> <li>1. Mentee and mentor demographic information</li> <li>2. How mentor-mentee relationships are formed</li> <li>3. How mentor-mentee relationships are maintained</li> <li>4. Qualities sought in a mentor and the benefits to mentees</li> <li>5. Barriers to mentorship from the mentee's perspective</li> </ol> <p>Participants provided information about the mentor with whom they had worked most closely. Mentors were attending physicians (88%) and residents (12%)</p>	<p>Types of interactions between mentor and mentee</p> <p>High value to low value from mentee's perspective:</p> <ul style="list-style-type: none"> <li>- "Scheduled meeting to discuss career and personal goals</li> <li>- One-on-one teaching technical skill in the OR</li> <li>- Informal cup of coffee or lunch chat</li> <li>- Providing constructive criticism</li> <li>- Allowing technical participation in a case</li> <li>- Teaching on clinical rounds</li> <li>- Didactic lectures</li> <li>- Teaching technical skills outside of the OR (ie, suture laboratory)</li> <li>- Social events outside of work"</li> </ul> <p>Mentor characteristics and attributes</p> <p>High value to low value from the mentee's perspective:</p> <ul style="list-style-type: none"> <li>- "A genuine interest in your career and personal development</li> <li>- Willingness to set time aside for teaching</li> <li>- Clinical and/or scientific expertise</li> <li>- Being well connected and having leadership roles in plastic surgery</li> <li>- Patient care capabilities and bedside manner that you would like to emulate</li> <li>- Technical skill"</li> </ul>
Hauc et al <sup>35</sup>	<p>Primary article</p> <p>A random sampling of articles published in high-impact plastic and reconstructive peer-reviewed journals within the last 10 years. Analyzed for first and senior authors' race and ethnicity and number of citations</p>	<p>Underrepresented in medicine authorship of plastic surgery publications is limited and can be augmented by mentorship</p> <ul style="list-style-type: none"> <li>- "Black first-authors were 26 times more likely to be present in the plastic and reconstructive literature if a Black senior author was involved in the study"</li> <li>- 11 Times more likely among Hispanic authors</li> </ul>
Janes et al <sup>36</sup>	<p>Primary article</p> <p>A qualitative survey of 14 mentors with a history of academic medicine in plastic surgery. Each mentor provided their own mentor (senior mentor) and mentee. Thirteen mentor-mentee pairs for which both members had responded with included. The mentor and mentee pairs responded to 3 questions:</p> <ol style="list-style-type: none"> <li>"1. Do you recall a particular event or series of events with a particular mentor that helped to direct you toward a career focused in plastic surgery?"</li> <li>2. If you could encourage current residents/fellows to pursue a career in plastic surgery, what advice would you give them?"</li> <li>3. Is there a particular method that you have found to be the most effective in directing residents/fellows toward a stable long-term career in plastic surgery?"</li> </ol>	<ul style="list-style-type: none"> <li>- "Importance of sponsorship: members of each generation of plastic surgeons ascended into leadership. Successful mentors demonstrate a pattern of guiding mentees to become leaders and promote mentees nationally</li> <li>- Encourage mentees to find what they are passionate about</li> <li>- Lead by example</li> <li>- Use research time as an opportunity for mentorship</li> <li>- Discuss complex cases with mentees</li> <li>- Extend lessons from the mentor-mentee relationship to advance plastic surgery. Mentor-mentee relationship is a 2-way street. Mentors should be willing to be challenged"</li> </ul>
Myers et al <sup>37</sup>	<p>Primary article</p> <p>A survey of American Society of Plastic Surgeons members in various stages of practice (response rate: 11.4%, 292 of 2555). The survey assessed "demographics, academic appointments, leadership roles, the experience of mentorship (at the resident and attending levels), and opinions regarding ideal implementation of mentorship model, including the necessity for racial and gender concordance"</p>	<ul style="list-style-type: none"> <li>- Female plastic surgeons felt it was more important for mentees to have gender and race/ethnicity concordance to their mentors compared with male plastic surgeons</li> </ul> <p>Priorities of mentees with regard to mentorship from most to least important:</p> <ul style="list-style-type: none"> <li>- "Clinical judgment</li> <li>- Managing family/work-life balance</li> <li>- Leadership techniques</li> <li>- Board examination preparation"</li> </ul>
Silvestre et al <sup>38</sup>	<p>Primary article</p> <p>A request for research opportunities and in-person meetings sent from a medical student to academic plastic surgeon faculty, 498 e-mails delivered, 363 responses received, 283 responses indicated accessibility for mentorship</p> <p>"E-mail responses were analyzed for content. The primary outcome was the rate of positive response, which was recorded if the meeting request was fulfilled. E-mails were noted for discussion of available research projects and acceptance of a mentorship role. A negative response was recorded if the student was rejected, referred, or ignored"</p>	<p>Mentor characteristics associated with accessibility for mentees</p> <ul style="list-style-type: none"> <li>- Younger faculty members (medical school class <math>\geq</math> 1989)</li> <li>- Fellow of the American College of Surgeons distinction</li> </ul>

(Continued)

**Table 1. Continued**

Primary Articles		
Commentary Pieces		
Bill and Woods <sup>39</sup>	Commentary piece A tribute to luminary mentor Dr. Richard F. Edlich	<p>“Trait of mentor Dr. Edlich best personifies is that of a caring friend”</p> <p>“Caring allows for the transformation of relationships from that of a student and a teacher to that of colleagues”</p> <p>“When I appreciated the enormous spiritual and intellectual powers of my students, I understood that my perception of myself as a teacher was an obstacle and barrier to communication with students. Consequently, I no longer consider myself a teacher, but rather, a colleague”—Dr. Edlich</p> <p>“Professor of the Open Door, always available, and always willing to put down work to talk freely in open exchange”</p>
Nikkhah and Rawlins <sup>40</sup>	Commentary piece A report of qualities authors have found in the best surgical mentors	<p>Qualities of a mentor</p> <ul style="list-style-type: none"> <li>- Emotional quotient</li> <li>- The teacher</li> <li>- The evolving surgeon</li> <li>- The innovator: never blame others or trainees for their failures</li> <li>- The evidence-based surgeon</li> </ul>
Stuzin <sup>41</sup>	Commentary piece A personal tribute to Henry Kawamoto	<ul style="list-style-type: none"> <li>- Nurtured interest in academic medicine</li> <li>- Empowered author to become a leader in the field of plastic surgery</li> </ul>

OR, operating room; postgraduate year 1, PGY-1.

academic inspiration that was nurtured under Kawamoto, stating, “My own academic involvement, serving on the American Board of Plastic Surgery, as coeditor of the *Journal of Plastic and Reconstructive Surgery*, as well as serving as chairman of the Baker Gordon Symposium on Cosmetic Surgery, is largely an offspring of the academic interest that began under the auspices of Dr. Kawamoto and nurtured by the strong influence of my long association with Dr. Thomas Baker.” Nikkhah and Rawlins<sup>40</sup> touch on the qualities the authors have seen in the best surgical mentors, offering a high emotional quotient as a mainstay among additional characteristics. With regard to emotional quotient, the authors state, “We have all heard that the surgeon who is *Available, Affable, and Approachable* is the best role model for a Plastic Surgeon.”<sup>40</sup>

### Shared Identities

Identity concordance emerged as an additional theme. Myers et al<sup>37</sup> presented data indicating a statistically significant preference for gender and race/ethnicity concordance to their mentors among female mentees compared with male mentees, whereas Hauc et al<sup>35</sup> alluded to identity concordance in research mentorship, showing that underrepresented groups were more likely to be present in the plastic and reconstructive literature if a race-concordant senior author were present. Silvestre et al<sup>38</sup> demonstrated that the most accessible mentors were younger with a Fellow of the American College of Surgeons distinction.

## DISCUSSION

The mentor-mentee relationship is crucial to the success of future plastic surgeons. The most important factor affecting medical students’ desire to train at a program is mentorship,<sup>42</sup> and graduates of residency are more

likely to pursue academic careers if they have had strong mentorship.<sup>43</sup> The beginning of mentorship in medical school often begins with medical students reaching out to residents and faculty for research opportunities.<sup>44</sup> Studies show that mentorship and structured research fellowships increase the likelihood of matching into residency and fellowship.<sup>45,46</sup> For many medical students, home plastic surgery programs do not exist, leading to challenges in finding mentors in the field. Proposed strategies involve partnering programs without residency programs with programs that have residency programs.<sup>47,48</sup> Mentorship may be mutually beneficial for both mentors and mentees. For example, in an analysis of abstracts presented at Plastic Surgery The Meeting, medical students had the highest conversion rate of abstracts to articles compared with fellows or attendings.<sup>49</sup>

Identifying strong mentors can be challenging for trainees. As trainees advance through each educational stage, there is pressure to connect with someone in the field. It can be difficult to distill the qualities that make a strong mentor. This study sought to better understand, which qualities are consistently ranked as important or of high value to trainees in plastic surgery by aggregating available data. The inclusion of commentary pieces was thought to be important, as these pieces of writing often contain a unique perspective on mentorship that cannot be adequately captured in the primary literature.

We were initially surprised by the lack of primary literature characterizing the qualities of mentors in the field of plastic surgery. Although the literature contains a plethora of studies and reviews advocating for mentorship programs and commenting on mentor qualities,<sup>25,45,50,51</sup> our systematic review yielded only 8 primary studies that sought to characterize mentor qualities specific to plastic

Study	JBIR study type:	Is there congruity between the stated philosophical perspective and the research question or methodology?	Is there congruity between the research methodology and the research objectives?	Is there congruity between the research methodology and the methods used to collect data?	Is there congruity between the research methodology and the representation and analysis of data?	Is there congruity between the research methodology and the interpretation of results?	Is there a statement locating the researcher culturally or theoretically?	Is the influence of the researcher on the research, and vice-versa, addressed?	Are participants, and their voices, adequately represented?	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	Overall
Janes et al (2022)	Qualitative	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Include
Study	JBIR study type:	Is the generator of the narrative a credible or appropriate source?	Is the relationship between the text and its context explained? (where, when, who with, how)	Does the narrative present the events using a logical sequence so the reader or listener can understand how it unfolds?	Do you, as reader or listener of the narrative, arrive at similar conclusions to those drawn by the narrator?	Do the conclusions flow from the narrative account?	Do you consider this account to be a narrative?					Overall
Bill and Woods (1997)	Narrative	Yes	Yes	Yes	Yes	Yes	Yes					Include
Nikkhah and Rawlins (2019)	Narrative	Yes	No	No	Yes	Yes	Unclear					Include
Stuzlin (2012)	Narrative	Yes	Yes	Yes	Yes	Yes	Yes					Include
Study	JBIR study type:	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was appropriate statistical analysis used?			Overall
Barker et al (2016)	Cross-sectional	Yes	Yes	NA - descriptive study	Yes	NA	NA	Yes	Yes			Include
Hauc et al (2024)	Cross-sectional	Yes	Yes	NA - descriptive study	Yes	NA	NA	Yes	Yes			Include
Myers et al (2024)	Cross-sectional	Yes	Yes	NA - descriptive study	Yes	NA	NA	Yes	Yes			Include
Silvestre et al (2025)	Cross-sectional	Yes	Yes	Yes	Yes	NA	NA	Yes	Yes			Include

Fig. 2. Risk of bias assessment performed for each study using the Joanna Briggs Institute “critical appraisal checklist for analytical cross-sectional study,” “critical appraisal checklist for qualitative research,” and “critical appraisal checklist for textual evidence: narrative.”

surgery. Although the idea of mentorship is often referenced in literature, there is a clear deficiency in the effort to elucidate core qualities in a mentor.

### Conserved Qualities

Through a systematic review of the literature, there were key recurring themes prevalent in an effective mentor. Two of the conserved qualities included “time investment and accessibility” and “shared identities.”

A mentor’s time investment and accessibility in the eyes of the mentee is critical. Barker et al<sup>34</sup> specifically identified scheduled meetings, one-on-one surgical teaching, and informal coffee chats as possible ways a mentor can invest their time in a mentee.<sup>22</sup> Janes et al<sup>36</sup> also reported that using research time for mentorship can be a strategy for mentors to invest time in their mentee relationships.<sup>23</sup> Interestingly, Silvestre et al<sup>38</sup> found in their survey evaluating mentor accessibility that younger attending surgeons were more likely to be available for research opportunities and in-person meetings.<sup>26</sup> The included commentary studies reflected the importance of time spent by mentors in

the development of mentees. In fact, all 8 articles included time investment in some capacity in what makes a good mentor. As a result, the authors conclude that in the process of identifying a potential mentor, it is important for both the mentor and mentee to ensure there is the necessary time available to invest in the relationship.

Shared identities between mentor and mentee is another observed conserved theme in our review. Shared identities can be understood as similar personal and clinical values. Effective mentor and mentee relationships often stem from a mentor serving as a role model for the mentee, modeling the career the mentee can aspire to. Therefore, the merit of the mentor seems to matter. Barker et al<sup>34</sup> identified clinical and technical expertise in mentors as highly valued by mentees.<sup>22</sup> Furthermore, Janes et al<sup>36</sup> commented on the importance of a mentor to “lead by example.”<sup>23</sup>

Shared identities range from racial or gender concordance to the struggles of left-handedness in the operating room.<sup>35,37,52</sup> Hauc et al<sup>35</sup> and Myers et al<sup>37</sup> identified race and gender concordance as important attributes

in a mentor for mentees. Similar identities may point to shared experiences that allow mentors and mentees to more effectively relate to one another. Establishing relationships with minority mentors in plastic surgery remains challenging. In a landmark study of demographic data from the Association of American Medical Colleges, Butler et al<sup>2</sup> shed light on the deficiency of minority representation in plastic surgery at every level in academia. This trend has persisted over the past few decades.<sup>53</sup> Persad-Paisley et al<sup>54</sup> found that self-identified Black and Hispanic students experienced decreases in representation at each successive stage in the plastic surgery pipeline and drew a focus on the need for diversity efforts, including premedical recruitment and professional support for minority students. Female underrepresentation in plastic surgery continues to be one of the most prominent barriers affecting the ability for trainees to connect with mentors across all educational levels trainees.<sup>55</sup> These discrepancies have the opportunity to be rectified, as studies demonstrate an association between leadership diversity and diversity of trainees,<sup>13,56</sup> and interventions such as mentoring seminars have been shown to improve female interest in the surgical field.<sup>57</sup> Although the benefit of identity-concordant relationships was highlighted in the literature, the personal and professional growth that is achieved from working with colleagues from diverse backgrounds cannot be overstated. It is important to note that personality characteristics and qualities identified in the primary literature are not necessarily specific to the plastic surgeon; rather, many of these qualities are requisite attributes in any healthcare mentor.

### The Mentee's Role

Despite this article's focus on the qualities of mentors, the surgical literature describes the mentee's role in the mentee-mentor dynamic; the most crucial mentee qualities exhibited by medical students as reported by attending surgeons and residents include willingness to learn, working hard, and demonstrating curiosity.<sup>58</sup> Hackenberger et al<sup>59</sup> offered qualities of excellent residents in the literature as stratified by stage of clinical training, such as preparation for operative cases and leadership capability, whereas Janis et al<sup>60</sup> reported time constraints as the largest perceived obstacle to developing relationships with mentees from the mentor standpoint.

### Summary Thoughts and Recommendations

Mentors have the capacity to guide mentees and potentially alter their educational and life course. This is a reality that should not be taken for granted. Mentors should invest in their mentees, encourage them, and offer honest feedback. Mentees should seek mentors who exemplify these qualities. Effective mentorship skills are not necessarily intrinsic to each surgeon. Rather, mentorship is a dynamic skill that can be acquired and improved through programming. Moreover, mentorship is not a one-size-fits-all relationship. It is natural for mentees to have mentors for various aspects of their personal and professional lives.

As proposed by Ramanadham et al,<sup>51</sup> the strength of mentorship programs can be augmented through specific residency review committee mandates and the implementation of curricula. Institutional programs such as the Plastic and Reconstructive Surgery Diversity and Inclusion Mentorship Experience and the creation of national organizations, including The Women Plastic Surgeons of Canada group, are vital to promote the success of underrepresented groups in plastic surgery.<sup>61,62</sup> Efforts such as the American Society of Plastic Surgeons Essentials of Leadership have the potential to teach leaders in plastic surgery the necessary tools to become successful mentors.<sup>63</sup> We echo the sentiments of other authors in encouraging professional organizations such as the American Association of Plastic Surgeons and the American Society of Plastic Surgeons to generate and augment their relationships with organizations of underrepresented surgeons in medicine to increase the diversity of mentors.<sup>36</sup> As suggested by Adetayo,<sup>64</sup> summer research programs and the Plastic Surgery Educational Foundation Visiting Professors program are ways in which minority plastic surgeons can build mentorship with trainees on an individual level. It is important to note that mentorship is lifelong and integral across all stages of training, and attending physicians report some of the lowest rates of mentorship.<sup>55</sup> Abelson et al<sup>65</sup> reported that across all surgical specialties, Black assistant professors had the lowest 10-year promotion rate, a disparity that was ameliorated at the associate professor level. As a surgical discipline, we must enhance our efforts to support our faculty colleagues. Peer mentorship or "horizontal mentorship" should not be overlooked as a source of guidance and inspiration.<sup>66</sup> The importance of mentorship in plastic surgery is evident; therefore, an understanding of the consistently impactful qualities of a mentor is critical to the development of fruitful mentor-mentee relationships. This systematic review elucidated the qualitative and quantitative data describing mentor qualities and further highlighted the need for additional, rigorous primary studies to aid in further optimizing mentorship programs and to identify barriers to successful mentorship.

### Limitations

Limitations to this study included the search inputs used to conduct the systematic review of the literature as well as the eligibility criteria for the inclusion of records. It is possible that records that included data on mentor qualities may have been excluded due to lack of keywords in the title or abstract.

*Vinay Rao, MD, MPH*

Department of Orthopedics

Perelman School of Medicine

University of Pennsylvania

3737 Market Street

Philadelphia, PA 19104

E-mail: [vinayrao.md@gmail.com](mailto:vinayrao.md@gmail.com)

### DISCLOSURE

*The authors have no financial interest to declare in relation to the content of this article.*

## REFERENCES

- Henry-Noel N, Bishop M, Gwede CK, et al. Mentorship in medicine and other health professions. *J Cancer Educ.* 2019;34:629–637.
- Butler PD, Britt LD, Longaker MT. Ethnic diversity remains scarce in academic plastic and reconstructive surgery. *Plast Reconstr Surg.* 2009;123:1618–1627.
- Hughes AJ, Samson TD, Henry CR, et al. A descriptive analysis of integrated plastic surgery residency program directors in the United States. *Ann Plast Surg.* 2022;89:344–349.
- Wenzinger E, Weinstein B, Singh R, et al. Deconstructing a leader: an in-depth analysis of the commonalities between plastic surgery chiefs and chairmen. *Plast Reconstr Surg.* 2019;144:235–241.
- Parmeshwar N, Stuart ER, Reid CM, et al. Diversity in plastic surgery: trends in minority representation among applicants and residents. *Plast Reconstr Surg.* 2019;143:940–949.
- Chaput B, Bertheuil N, Jacques J, et al. Professional burnout among plastic surgery residents: can it be prevented? outcomes of a national survey. *Ann Plast Surg.* 2015;75:2–8.
- Fanning JE, Patel A, Janis JE. The current state of plastic surgery residency wellness programs: benefits and barriers. *Plast Reconstr Surg Glob Open.* 2024;12:e5567.
- Khansa I, Janis JE. A growing epidemic: plastic surgeons and burnout—a literature review. *Plast Reconstr Surg.* 2019;144:298e–305e.
- Raborn LN, Janis JE. Overcoming the impact of COVID-19 on surgical mentorship: a scoping review of long-distance mentorship in surgery. *J Surg Educ.* 2021;78:1948–1964.
- Frates B, Cron D, Lubitz CC, et al. Incorporating well-being into mentorship meetings: a case demonstration at Massachusetts General Hospital Department of Surgery a Harvard Medical School affiliate. *Am J Lifestyle Med.* 2023;17:213–215.
- Al Qurashi AA, Mortada H, Alrobaiea S, et al. Satisfaction of Saudi Board Plastic Surgery residents with the training program: a national survey. *Plast Reconstr Surg Glob Open.* 2022;10:e4071.
- Kaufman T, Ad-El D. Satisfaction from plastic surgery residency: a national survey. *Ann Plast Surg.* 2020;85:344–351.
- Benaroch D, Oleru OO, Dietz H, et al. Diversity of leadership and its influence on diversity of integrated plastic surgery residency cohorts: a study in the virtual era. *Eplasty.* 2023;23:e63.
- Enani GN, Brydges R, MacRae HM, et al. Exploring mentorship in surgery: an interview study on how people stick together. *Med Educ.* 2023;57:1028–1035.
- Entezami P, Franzblau LE, Chung KC. Mentorship in surgical training: a systematic review. *Hand (N Y).* 2012;7:30–36.
- Lee FQH, Chua WJ, Cheong CWS, et al. A systematic scoping review of ethical issues in mentoring in surgery. *J Med Educ Curric Dev.* 2019;6:2382120519888915.
- Silva AK, Preminger A, Slezak S, et al. Melting the plastic ceiling: overcoming obstacles to foster leadership in women plastic surgeons. *Plast Reconstr Surg.* 2016;138:721–729.
- Murali S, Harris AB, Snow M, et al. The mentee perspective: evaluating mentorship of medical students in the field of orthopaedic surgery. *J Am Acad Orthop Surg Glob Res Rev.* 2023;7:e22.00267.
- McCord JH, McDonald R, Sippel RS, et al. Surgical career choices: the vital impact of mentoring. *J Surg Res.* 2009;155:136–141.
- Verheyden CN, Levin LS. Plastic surgery leadership in an institution: a primer. *Plast Reconstr Surg.* 2010;125:1819–1825.
- Bennett KG, Ingraham JM, Schneider LF, et al. The teaching of ethics and professionalism in plastic surgery residency: a cross-sectional survey. *Ann Plast Surg.* 2017;78:552–556.
- Wang JS, Singh T, Bruno EA, et al. Conceptual framework for a plastic surgery residency leadership curriculum. *Plast Reconstr Surg Glob Open.* 2020;8:e2852.
- Wagner IJ, Hultman CS. Elevation: developing a mentorship model to raise the next generation of plastic surgery professionals. *Ann Plast Surg.* 2013;70:606–612.
- Dzubarba B, Bajestani N, Paras S, et al. A systematic review of the state of preclinical mentorship programs in plastic and reconstructive surgery. *Plast Reconstr Surg Glob Open.* 2023;11:e5322.
- Franzblau LE, Kotsis SV, Chung KC. Mentorship: concepts and application to plastic surgery training programs. *Plast Reconstr Surg.* 2013;131:837e–843e.
- Page MJ, Moher D, Bossuyt PM, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ.* 2021;372:n160.
- Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021;372:n71.
- Moola SMZ, Tufanaru C, Aromataris E, et al. Systematic reviews of etiology and risk. In: Aromataris E, Lockwood C, Porritt K, et al, eds. *Manual for Evidence Synthesis.* JBI 2020.
- JB Institute. Checklist for textual evidence: narrative. Available at <https://jbi.global/critical-appraisal-tools>. Accessed August 30, 2024.
- JB Institute. Checklist for case reports. Available at <https://jbi.global/critical-appraisal-tools>. Accessed August 30, 2024.
- JB Institute. Checklist for qualitative research. Available at <https://jbi.global/critical-appraisal-tools>. Accessed August 30, 2024.
- McArthur A, Klugarova J, Yan H, et al. Innovations in the systematic review of text and opinion. *Int J Evid Based Healthc.* 2015;13:188–195.
- Lockwood C, Munn Z, Porritt K. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *Int J Evid Based Healthc.* 2015;13:179–187.
- Barker JC, Rendon J, Janis JE. Medical student mentorship in plastic surgery: the mentee’s perspective. *Plast Reconstr Surg.* 2016;137:1934–1942.
- Hauc SC, Rivera JC, Pondugula N, et al. A 10-year analysis of the racial distribution of authors in plastic surgery research and the impact of minority mentorship. *Am J Surg.* 2024;236:115744.
- Janes LE, Kearney AM, Taub PJ, et al. The importance of mentorship in shaping the careers of academic leaders in plastic surgery. *Plast Reconstr Surg.* 2022;150:224–232.
- Myers PL, Amalfi AN, Ramanadham SR. Mentorship in plastic surgery: a critical appraisal of where we stand and what we can do better. *Plast Reconstr Surg.* 2021;148:667–677.
- Silvestre J, So AL, Lee BT. Accessibility of academic plastic surgeons as mentors to medical students. *Ann Plast Surg.* 2015;74:85–88.
- Bill TJ, Woods JAD. Edlich drive: a metaphor for the Edlich tradition. *J Emerg Med.* 1997;15:525–530.
- Nikkah D, Rawlins J. Training and mentorship in plastic surgery. *J Plast Reconstr Aesthet Surg.* 2019;72:1576–1606.
- Stuzin JM. A personal tribute to a great educator: how Henry Kawamoto influenced my interest in facial soft tissue anatomy and changed my plastic surgery career. *J Craniofac Surg.* 2012;23:1944–1945.
- Zuo KJ, Retrouvey H, Wanzel KR. Factors that affect medical students’ perception and impression of a plastic surgery program: the role of elective rotations and interviews. *Ann Plast Surg.* 2019;82:224–228.
- Mandel BA, Weber SM, Gutowski KA, et al. What influences a plastic surgery resident to pursue an academic career? *Plast Reconstr Surg Glob Open.* 2018;6:e1860.
- Zeng SL, Zhang GX, Porras DF, et al. Identifying barriers faced by applicants without a home residency program when matching into plastic surgery. *Arch Plast Surg.* 2023;51:139–146.
- Lopez CD, Khoo KH, Girard AO, et al. Mentorship is critical: an analysis of the 2022 plastic surgery match. *Ann Plast Surg.* 2023;90:S645–S653.

46. Romeo DJ, Du S, Massenburg BB, et al. Clinical research fellowship fosters mentorship, teamwork, and productivity: our 11-year experience with a craniofacial research fellowship. *J Craniofac Surg.* 2024;35:744–748.
47. Sasson DC, Shah ND, Reddy NK, et al. Improving medical student recruitment into plastic surgery: pairing orphaned medical students with sister mentorship programs. *Plast Reconstr Surg.* 2021;147:1095e–1096e.
48. Sasson DC, Shah ND, Yuksel SS, et al. Improving medical student recruitment into plastic surgery: a survey of orphaned medical students. *J Surg Educ.* 2022;79:139–146.
49. Vishwanath N, Cummings OW, Lim J, et al. Conversion rate of abstracts presented at plastic surgery the meeting from 2010 to 2019: a 10-year analysis of factors for success. *Ann Plast Surg.* 2024;92:S298–S304.
50. Garimella RS, Wood JS, Hultman CS. All that you can't leave behind: professionalism as the focus of mentoring and modeling. *J Craniofac Surg.* 2015;26:2275–2278.
51. Ramanadham SR, Rohrich RJ. Mentorship: a pathway to succeed in plastic surgery. *Plast Reconstr Surg.* 2019;143:353–355.
52. Savetsky IL, Cammarata MJ, Kantar RS, et al. The left-handed plastic surgery trainee: perspectives and recommendations. *Plast Reconstr Surg Glob Open.* 2020;8:e2686.
53. Hernandez JA, Kloer CI, Porras Fimbres D, et al. Plastic surgery diversity through the decade: where we stand and how we can improve. *Plast Reconstr Surg Glob Open.* 2022;10:e4134.
54. Persad-Paisley EM, Uriarte SA, Kuruvilla AS, et al. Examining racial and gender diversity in the plastic surgery pipeline: where is the leak? *Plast Reconstr Surg Glob Open.* 2024;12:e5552.
55. Abdou SA, Sharif-Askary B, Sayyed AA, et al. Can mentorship shatter the glass ceiling in academic microsurgery? A national survey of microsurgery fellowship-trained women. *Plast Reconstr Surg.* 2023;152:1143e–1153e.
56. Plana NM, Smith KL, Wo LM, et al. The importance of diversity in leadership in influencing change in academic plastic surgery and its subspecialties. *Plast Reconstr Surg.* 2022;150:1372e–1373e.
57. Mossanen JC, Schmidt M, Brucken A, et al. Short-time mentoring—enhancing female medical students' intentions toward surgical careers. *Med Educ Online.* 2024;29:2347767.
58. ElHawary H, Salimi A, Gorgy A, et al. Medical student mentorship in surgery: lessons learnt and future directions. *J Surg Educ.* 2022;79:129–138.
59. Hackenberger PN, Janis JE. Demonstrating excellence in plastic surgery residency. *Plast Reconstr Surg Glob Open.* 2022;10:e4061.
60. Janis JE, Barker JC. Medical student mentorship in plastic surgery: the mentor's perspective. *Plast Reconstr Surg.* 2016;138:925e–935e.
61. Reghunathan M, Crowley JS, Segal R, et al. Plastic surgery diversity, equity, and inclusion mentorship program and workshop: a single institution's experience. *Plast Reconstr Surg.* 2023;151:226–229.
62. Retrouvey H, Gdalevitch P. Women plastic surgeons of Canada: empowerment through education and mentorship. *Plast Surg (Oakv).* 2018;26:145–147.
63. American Society of Plastic Surgeons. Essentials of leadership. Available at <https://www.plasticsurgery.org/for-medical-professionals/education/events/essentials-of-leadership>. Accessed June 26, 2024.
64. Adetayo O. Ethnic diversity remains scarce in academic plastic and reconstructive surgery. *Plast Reconstr Surg.* 2010;125:1848.
65. Abelson JS, Wong NZ, Symer M, et al. Racial and ethnic disparities in promotion and retention of academic surgeons. *Am J Surg.* 2018;216:678–682.
66. Lin LO, Barker JC, Khansa I, et al. A primer for success as an early career academic plastic surgeon. *Plast Reconstr Surg Glob Open.* 2022;10:e4066.

---

## SECOND QUARTER (Months 4-6)

### Building Meaningful Mentorship: From Connection to Collaboration



#### **Objective:**

- Learn strategies to develop authentic mentor-mentee relationships.
- Explore ways to transform mentorship into collaborative opportunities, such as research, projects, or leadership initiatives.

#### **Articles:**

- The Less Emphasized Link in Mentorship: The Role of the Mentee
- Surgical Mentorship for Next Generation Is Changing

#### **Guided Discussion Questions:**

- What qualities make a mentorship relationship meaningful for both mentor and mentee?
- How can mentees take initiative to strengthen and sustain mentorship connections?
- What examples of mentor-mentee collaborations have you observed or participated in?
- How can mentorship evolve into active collaboration while maintaining mutual respect and balance?
- What barriers exist to effective collaboration, and how can they be addressed?

some of the highest United States Medical Licensing Examination scores of all applicants and achieve remarkable accomplishments, including Alpha Omega Alpha and other high honors. Thus, there is ample intellectual ability and experience for plastic surgery residents to enter surgical critical care fellowship and succeed, as demonstrated by the handful of practicing plastic surgery intensivists.

The consummate burn practitioner must have skills that span the spectrum of what a burn patient needs. This includes surgical critical care and reconstructive plastic surgery. As plastic surgeons continue to battle encroachment on multiple fronts, burn surgery remains wide open, both economically and as fertile ground for innovation.

DOI: [10.1097/PRS.00000000000011868](https://doi.org/10.1097/PRS.00000000000011868)

**Clifford C. Shekter, MD, MS**

Department of Surgery  
Stanford University School of Medicine  
Stanford, CA  
Regional Burn Center  
Santa Clara Valley Medical Center  
San Jose, CA

**Benjamin Levi, MD**

Department Surgery  
University of Texas Southwestern  
Dallas, TX  
Parkland Burn Center  
Dallas, TX

Correspondence to Dr. Shekter  
Department of Surgery  
Stanford University School of Medicine  
770 Welch Road, Suite 400  
Palo Alto, CA 94304  
[shekter@stanford.edu](mailto:shekter@stanford.edu)  
@cshekter

**DISCLOSURE**

*The authors have no financial disclosures or conflicts of interest in relation to the content of this article. No funding was received for this work.*

**REFERENCES**

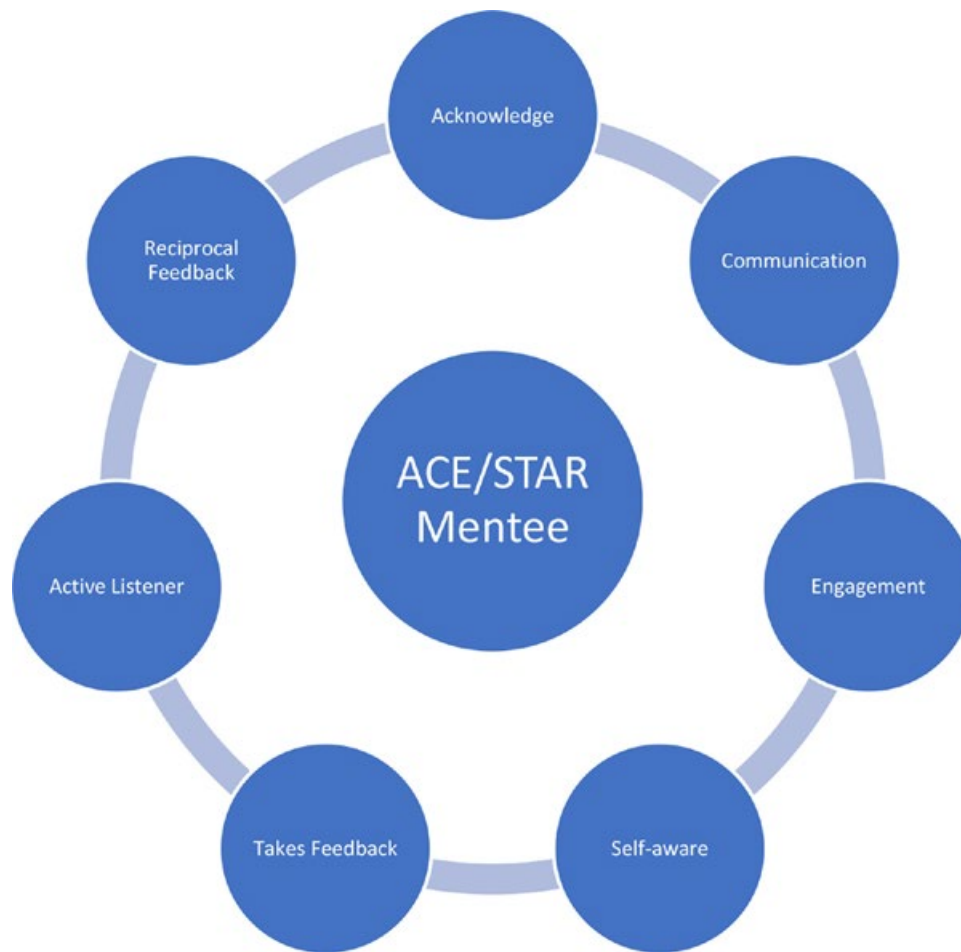
1. Crowe CS, Massenburg BB, Morrison SD, Naghavi M, Pham TN, Gibran NS. Trends of burn injury in the United States: 1990 to 2016. *Ann Surg*. 2019;270:944–953.
2. Egro FM, Johnson ED, Kenny EM, et al. A qualitative survey study of United States burn units: pathways to a career in burn surgery. *J Burn Care Res*. 2019;40:595–600.
3. Perrault DP, Rochlin DH, Gillenwater TJ, Karanas YL, Shekter CC. The impact of plastic surgery volume on inpatient burn outcomes. *Plast Reconstr Surg*. 2021;148:1001e–1006e.
4. Geomelas M, Ghods M, Ring A, Ottomann C. “The maestro”: a pioneering plastic surgeon—Sir Archibald McIndoe and his innovating work on patients with burn injury during World War II. *J Burn Care Res*. 2011;32:363–368.
5. Vrouwe SQ, Pham CH, Minasian RA, Yenikomshian HA, Garner WL, Gillenwater TJ. The state of burn care training during plastic surgery residency. *Ann Plast Surg*. 2020;85:122–126.
6. Accreditation Council for Graduate Medical Education. ACGME Program Requirements for Graduate Medical Education in Plastic Surgery (Integrated and Independent). [cited 2024 Mar 20]. Available at: [https://www.acgme.org/globalassets/pfassets/programrequirements/360-362\\_plasticsurgery\\_2023.pdf](https://www.acgme.org/globalassets/pfassets/programrequirements/360-362_plasticsurgery_2023.pdf). Accessed March 11, 2025.

**The Less Emphasized Link in Mentorship: The Role of the Mentee**

The importance of mentorship in academic surgery cannot be overstated, as numerous studies have shown that it protects against surgical attrition and burnout.<sup>1,2</sup> The needs of a surgical mentee and how to become an effective mentor are discussed ubiquitously throughout the literature.<sup>1–5</sup> The role and expectations of the mentee, however, are rarely discussed, and this is paramount to developing an effective mentor–mentee relationship.

The biggest take-home message of this article for mentees is *to take responsibility and play an active role in the success of their mentorship*. There are characteristics that the ideal mentee can possess to help accomplish these responsibilities and enhance their relationship with the mentor (Fig. 1). Some of these responsibilities include respecting the mentor’s time and resources and acknowledging the responsibility of completing assigned tasks that arise from the mentorship. Respect for time includes setting agenda-driven meetings with identifiable objectives. While multiple factors can affect a meeting, it has been shown that the highest mentor dissatisfaction comes from a lack of mentee preparation and respect for time.<sup>3</sup> During initial meetings, the mentee must set realistic expectations with their mentor about topics to be addressed by priority.

Throughout the mentoring process, the mentee should be willing to receive feedback and adapt to overcome obstacles. The 4 R’s strategy of reflections, recommendations, resources, and referrals is a described process to incorporate feedback.<sup>2</sup> In addition, we would like to propose a fifth component of the strategy: receptiveness. Mentees should share their professional thoughts and *reflections*, focusing on identifying deficiencies and their learning plans to close the gap. This will allow the ability to provide *recommendations* on how to refine and implement this learning plan, which should be discussion-based, as the onus of open-ended and insightful questions falls on the mentee. The mentee can then ask for specific *resources* based on recommendations from the mentor. If the mentor feels that this is a deficiency that a colleague can better navigate, asking that colleague to assist the mentee would be the most appropriate course of action; this is the *referral* component.



**Fig. 1.** Characteristics of the ideal mentee.

While it is important to optimize the mentor–mentee relationship, there are common mistakes that mentees can make. Vaughn et al.<sup>4</sup> and Chopra et al.<sup>5</sup> describe specific mentee and mentor archetypes and the various errors they make. Based on their work, we describe 4 plastic surgery mentee types: the vampire, the shy mentee, the overcommitter, and the finger-pointer (Table 1).

Vampire mentees are described as draining the lifeblood of their mentors through countless communication attempts, regardless of the mentor’s generosity with their time. This behavior leads to burnout for the mentor, and often to the mentor moving on from the mentee.<sup>4,5</sup>

The shy mentee is the antithesis of the vampire. This mentee tends to undercommunicate, as they feel like a burden on their mentor. The shy mentee can be introverted by nature or can be intimidated by a hierarchical structure. This behavior can lead to a less fruitful outcome for both parties. An experienced mentor should recognize this mentee trait early and empower the mentee to engage in communication.

The overcommitter is a mentee who has difficulty refusing a request from their mentor. This archetype

has been shown to lead to high rates of burnout caused by their immense workload.<sup>4,5</sup> This mentee archetype must learn that focusing on prioritized tasks and maintaining a timeline will yield maximal results. The most important principle that overcommitters must remember is that by saying “yes” to one task, you are ultimately saying “no” to something else.

Finger-pointer mentees initially seem to work diligently and accept challenges at the onset of the relationship. As time goes on, they come to resent criticism and have excuses for failures they encounter. The finger-pointer can become incredibly difficult to mentor, as they have lost their ability to grow and instead pass off the blame to others. This mentee type must understand that surgical training is an arduous process requiring humility, while building confidence as a young surgeon. It is important for the mentor to challenge the mentee and demonstrate the importance of humility in surgical training. The mentor can be mutually vulnerable by sharing mistakes of their own; the multiple methods of feedback they received; and, ultimately, the times of continued growth as a senior surgeon.

**Table 1. Mentee Archetypes**

Mentee Archetype	Description	Plastic Surgery Example	Mentor/Mentee Intervention
Overcommitter	Not able to refuse a request from their seniors, colleagues, or mentor	The resident takes on countless research projects, leadership positions, committee roles, and so on.	The mentor should evaluate all projects and goals in relation to the available resources to ensure these can be realistically completed within the desired time frame. The mentee should focus on prioritized tasks and maintain deadlines.
Vampire	Not able to appreciate the time and resources of the mentor	The new intern cannot appreciate the demands of academic plastic surgery faculty and believes everything revolves around their success.	The mentor should maintain boundaries and communicate directly to allow the mentee to understand their behavior. The mentee should maintain openness to understand how their behavior is affecting the relationship.
Finger pointer	Initially seems to accept challenges, but ultimately resents criticism and does not accept challenges	This is a resident who does not accept feedback and develops a fixed mindset rather than a growth mindset.	The mentor can share moments of vulnerability or the required humility and patience needed to be a competent surgeon. The mentor should allow time and strategies to develop a growth mindset. The mentee must maintain humility and seek out difficult clinical and nonclinical experiences to remain humble.
Shy	Not able to take advantage of all opportunities	This resident might feel like a burden to their mentor because they don't want to take up too much of their mentor's time.	The mentor can attempt to initiate contact, reiterate the importance of the mentee taking initiative, and encourage more frequent engagement and communication. The mentee must be open to trusting their mentor and taking perceived risks.

Effective mentorship is paramount to success in academic plastic surgery, but it is important for both the mentor and the mentee to understand their roles in the relationship. The landscape for surgical residency is changing rapidly. Adapting to the dynamic role of being an ideal mentee will create the optimal learning environment for a successful plastic surgeon.

DOI: [10.1097/PRS.00000000000011835](https://doi.org/10.1097/PRS.00000000000011835)

**Pradeep K. Attaluri, MD**  
**Peter J. Wirth, MD**  
**Ellen C. Shaffrey, MD**  
**Michael L. Bentz, MD**  
**Ahmed M. Afifi, MD**

Division of Plastic and Reconstructive Surgery  
 University of Wisconsin School of Medicine  
 and Public Health  
 Madison, WI

Correspondence to Dr. Afifi  
 Division of Plastic Surgery  
 University of Wisconsin Health University Hospital  
 600 Highland Avenue  
 G5/361, Clinical Science Center

Madison, WI 53792  
[afifi@surgery.wisc.edu](mailto:afifi@surgery.wisc.edu)  
 Instagram: ahmedafifimd

### DISCLOSURE

*The authors have no financial disclosures or conflicts of interest to report.*

### REFERENCES

1. Myers PL, Amalfi AN, Ramanadham SR. Mentorship in plastic surgery: a critical appraisal of where we stand and what we can do better. *Plast Reconstr Surg*. 2021;148:667–677.
2. Hodgson K, Freeman D, Darling M. Developing mentee skills: a curriculum guide. *J Vet Med Educ*. 2022;49:423–431.
3. LeClere LE, Bishop ME. How to be a mentee: getting the most of your mentorship. *Clin Sports Med*. 2023;42:241–248.
4. Vaughn V, Saint S, Chopra V. Mentee missteps: tales from the academic trenches. *JAMA* 2017;317:475–476.
5. Chopra V, Arora VM, Saint S. Will you be my mentor? Four archetypes to help mentees succeed in academic medicine. *JAMA Intern Med*. 2018;178:175–176.

**BULLETIN**

# Surgical Mentorship for Next Generation Is Changing

*Shruti Koti, MD, Jennifer Xie, MD, Maya Chopra, Vihans Patel, MD, FACS*

September 12, 2024



In the 18th and early 19th centuries, the art of medicine and surgery was passed on through a close apprenticeship model, with students modeling their own practice after that of a trusted advisor and teacher. As the field of medicine moved into the modern era (early 1900s) and education became more formalized, physicians—including William Osler, MD, and former ACS President Harvey Cushing, MD, FACS—

advocated for a mentor-mentee relationship to maintain the benefits of the ancient apprenticeship model.<sup>1</sup>

Traditionally, mentorship was viewed as a one-way downstream effort from a senior mentor to a junior mentee (see Figure 1). Fortunately, the changing landscape of healthcare has created new opportunities for collaboration and partnership at different career stages.

Between 2001 and 2009, the number of surgeons who reported having their own self-employed practices decreased from 48% to 33%, and the majority of surgeons are now employed in large group practices or as full-time hospital employees.<sup>2</sup> Additionally, subspecialty training is a reality for the majority of surgeons entering practice, particularly at academic centers.

Against this backdrop of a changing medical landscape, surgical trainees today also have more demands on their time than ever before, from clinical duties to increasing administrative burden and time spent on electronic health records, to growing pressure to be productive in research, not to mention time spent fulfilling personal and familial obligations.

Given that mentors may have an enormous influence on a resident's specialty choice, professional niche, and well-being, it is important to pay closer attention to how we form and maintain these relationships.

As newer cohorts of medical students and residents begin to enter the workforce, it is becoming more apparent that generational differences affect medical education, workplace dynamics, and interpersonal relationships. Changes in medical school curricula, including a focus on competency-based education and flexible learning, have made their way into graduate medical training.

Trainees today place a higher emphasis on individual learning styles and preferences,

and greater transparency. One study investigating Millennials and Generation Z trainees found that not only are newer generations more collaborative and optimistic than previous generations, but they also are more likely to desire clearly defined expectations with structured approaches to training.<sup>3</sup> This desire for clearly defined roles and expectations must be addressed in the mentor-mentee relationship, as well.

A recent survey of medical students posed the following question, “What do you want from a mentor?” The responses included general career guidance, encouragement, networking opportunities, and research expertise—all demonstrating the range of mentoring preferences in students.<sup>4</sup> This wide variety of needs may be best addressed by different mentors.

In an opinion piece published in the *Journal of the American Medical Association*, four mentor archetypes are outlined to help mentees succeed in academic medicine.<sup>5</sup> While these models may be broadly applicable to trainees at all stages, surgical trainees experience a unique type of training. Growing demands on their time require a careful and deliberate crafting of a career that the mentee finds meaningful. Identifying what is meaningful for a surgical trainee is often a difficult and ongoing process, and one in which the mentor may play a key part.

With this in mind, it is important to clearly delineate one’s role in the mentor-mentee relationship. The following sections describe four key mentor roles for surgeons (see Figure 2).



Figure 1.

# Four Mentorship Styles for Surgical Trainees

## Cheerleader

The cheerleader may be thought of as a professional support system. This approach features a mentor who supports the mentee emotionally throughout their journey. The cheerleader has a willingness to share both positive and negative personal and professional experiences in order to provide a safe and comfortable environment where mentees can express themselves without fear of punishment or judgment.

Previous work has described the importance of finding the “right chemistry” (a mutual connection) in order to foster successful mentorship relationships.<sup>6</sup> While this concept is important in all professional relationships, the idea of chemistry is perhaps most important in this mentor type.

In addition to providing the mentee with encouragement, the cheerleader may assist in identifying strengths and weaknesses, providing tools for improvement, and encouraging the mentee’s drive toward and focus on their career.

“The key is finding someone who cares about you, and therefore, genuinely prompts and challenges you,” said Jose Prince, MD, FACS, surgeon-in-chief at Cohen Children’s Medical Center in Queens, New York, and current President of the Brooklyn-Long Island ACS Chapter.

Though the cheerleader role can be adopted at any stage in one’s career, closeness in age and life experience may enable a personal connection. Therefore, for the junior resident for example, the cheerleader is most likely to be a junior faculty member, while for the medical student interested in surgery, the cheerleader might be a resident who can provide encouragement and perspective.

## Advisor

The advisor is most closely aligned with the traditional mentor role. These individuals have professional experiences and resources to help guide mentees in their career trajectory, aid in scholarly work, and point them toward new career opportunities.

The advisor has a strong understanding of the mentee's professional potential and helps the mentee identify professional goals. The relationship between the advisor and the mentee may be unidirectional, with advice and guidance coming primarily from the mentor to the mentee. The relationship with an advisor should entail specific and measurable goals and learning outcomes, with regular review of timelines within the mentoring process.

Dr. Prince shares some ways in which mentors can take on the advisor role: "The advisor should really help the mentee answer the question 'who am I?' There are many ways to approach this. What kind of surgeon do you want to be? Can you handle the unknown, or do you need to have a plan in the OR? Do you want to be a generalist or a specialist? The advisor should help map out different ways to think about the decisions that a mentee needs to make."

## Coach

The coach is a mentor who can help improve the mentee's technical skills and expand his or her knowledge base. While research in this field is still developing, early work shows that coaching has the potential to improve performance and overall well-being.

Coaching offers the opportunity to individualize teaching and instruction based on the style and preference of the coach and mentee. As coaches provide short-term or singular guidance, they may have many mentees, and vice versa; a mentee may have many coaches.

"As a coach, even if your time with your mentee is short, setting clear expectations

helps orient your mentee and figure out what their goals should be during your time together,” said Susana Benitez Sanchez, MD, chief resident at Long Island Jewish Medical Center/Northwell Health in New York. “This helps build an atmosphere of open communication and ensures both coach and mentee are working toward the same endpoint.”

For residents, the coach often will be a more senior resident or faculty member who does not necessarily have the time to devote to a long-term relationship but can provide immediate feedback. Examples include senior residents teaching junior residents how to suture, perform a hand-sewn bowel anastomosis, or complete a complex surgical consultation.

For medical students, surgical residents may be the most appropriate type of coach, both for teaching technical skills such as suturing, as well as sharing knowledge on logistical and institutional processes.

## **Sponsor**

The sponsor is a mentor who provides important networking opportunities, is able to facilitate professional relationships, and can introduce the mentee into different academic circles. The experience and connections come into play when speaking on the mentee’s behalf to committees and organizations and introducing them to new career opportunities.

The sponsor, unlike the cheerleader or advisor, may not be involved in the day-to-day life of the mentee; rather, a sponsor helps oversee the mentee’s broad career trajectory.

For residents, sponsors should be leaders in their field, such as a department chair or institute director, who can use influence and position to propel mentees to the next stage of their career.

For medical students, a sponsor may not necessarily be a national leader in the field but should be in a leadership position within the institution. This might include a department chair, surgical residency program director, or dean of the medical school. Ideally, the sponsor also will have a large professional network to connect students with faculty in different fields for shadowing, research, or clinical opportunities.

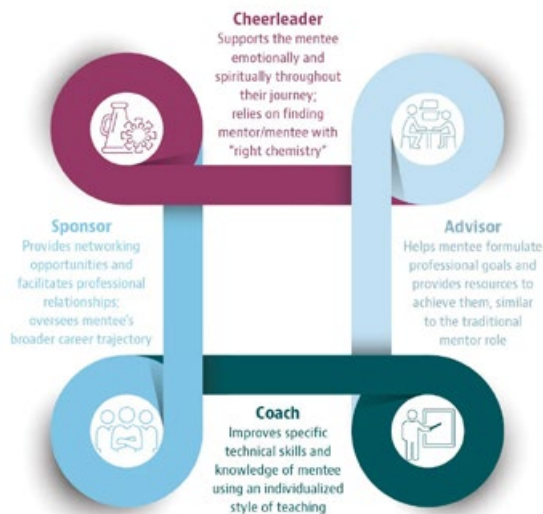


Figure 2.

Four Mentor Roles for Surgeons

## Growing Your Mentor Network

Often, mentorship is informal in surgical training and may be sporadic as schedules are difficult to align and trainees and faculty have shifting responsibilities. A recent editorial in *The American Journal of Surgery* outlines strategies for identifying a mentor at different stages of training.<sup>7</sup>

The authors suggest that in order to form meaningful mentorship relationships, medical students should “contact residents, junior faculty, and more senior faculty from different specialties they are interested in pursuing. While the initial introductions might

occur during a clinical rotation or by email, arranging a follow-up meeting is critical to solidifying the mentoring relationship.”

For residents, the authors suggest that “strategic mentors are the foundation for future professional growth and will most likely require an active effort as they arise from both internal and external connections within and outside the field.” Much of this advice also may be incorporated by early career faculty.

However, maintaining a diverse mentor network requires an additional step: Assessing one’s professional needs and identifying potential mentors whose strengths align with those needs. By carefully considering the four mentor roles and one’s own personal learning style and growth needs, mentees can successfully grow their mentor network.

## **Women and Underrepresented Minorities in Surgery**

It has been well established that disparities in academic medicine often are linked to ineffective mentorship and sponsorship at multiple levels.<sup>8,9</sup>

Unconscious bias and stereotypical thinking by mentors and colleagues may pose additional barriers for women and those underrepresented in medicine (URiM) who are frequently passed over for job opportunities in favor of their white male counterparts.<sup>10</sup> Acknowledgment of this unconscious bias is crucial, as mentors for surgical trainees often play a significant role in career advancement of the mentee. Additionally, it is important for leaders in the field to seek out mentees from a diverse range of backgrounds.

“With an increasing diversity of faculty, it is now easier to find a good fit for a broad variety of mentees,” explained Laura Hansen, MD, FACS, assistant professor of surgery at the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell in

Hempstead, New York, and a junior faculty member with a strong record of mentorship. “For me, having a female surgeon as a mentor who, like me, had children during training, helped me navigate different aspects of my career at different times. I wouldn’t have received that advice from someone who hadn’t faced similar challenges.”

To help promote success for women and URiM trainees on a larger level, institutions and programs could consider measuring and compensating faculty members who engage in mentorship and serve as advocates for trainees, as well as implementing institutional policies to address structural barriers.

---

**Dr. Shruti Koti** is a postgraduate year 4 (PGY4) categorical general surgery resident currently on her 2-year professional development time in conjunction with Cold Spring Harbor Laboratory and the Northwell Health Cancer Institute in New Hyde Park, NY.

---

**Dr. Jennifer Xie** is a PGY4 categorical general surgery resident at Northwell Health Long Island Jewish Medical Center in New Hyde Park, NY. Drs. Koti and Xie are active members of the Residents-as-Teachers Committee in their training program.

---

**Maya Chopra** is a third-year medical student at the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell in Hempstead, NY.

---

**Dr. Vihav Patel** is an acute care surgeon at Northwell Health Long Island Jewish Medical Center and vice chair for academic affairs at the Northwell Health Department of Surgery in New Hyde Park, NY. She also is an associate professor of surgery at the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell.

---

## REFERENCES

1. Siddiqui, S. Of mentors, apprenticeship, and role models: A lesson to relearn? *Med Educ Online*. 2014; 19:25428.
2. Charles AG, Ortiz-Pujols S, Ricketts T, Fraher E, et al. The employed surgeon: A changing professional paradigm. *JAMA Surg*. 2013 Apr;148(4):323-328.
3. Barmparas G, Imai TA, Gewertz BL. The millennials are here and they expect more from their surgical educators! *Ann Surg*. 2019;270(6):962-963.
4. Minor S, Bonnin R. What do medical students want from a mentor? *PRiMER*. 2022 September 8;6:36.
5. Chopra V, Arora VM, Saint S. Will you be my mentor? Four archetypes to help mentees succeed in academic medicine. *JAMA Intern Med*. 2018; Feb 1;178(2):175-176.
6. Burgess A, van Diggele C, Mellis C. Mentorship in the health professions: A review. *Clin Teach*. 2018;15(3):197-202.
7. Record SM, Chanenchuk T, Altieri M, Cannada L, et al. One step ahead: Finding mentors at all stages of a surgical career. *Am J Surg*. 2023;226(5):729-731.
8. Ramanan RA, Taylor WC, Davis RB, Phillips RS. Mentoring matters: Mentoring and career preparation in internal medicine residency training. *J Gen Intern Med*. 2006;21(4):340-345.
9. Westring AF, Sammel MD, Speck RM, Tuton LW, et al. Career trajectories of women from underrepresented minority groups at an academic medical center. *JAMA Netw Open*. 2021;4(3):e212723.
10. Kaatz A, Carnes M. Stuck in the out-group: Jennifer can't grow up, Jane's invisible, and Janet's over the hill. *J Womens Health (Larchmt)*. 2014 Jun;23(6):481-484.

RESTRICTED USE: Visitors to this website are strictly prohibited from using, uploading, sharing, or incorporating any content, materials, data, or information provided by the ACS into any third-party applications, platforms, software, or websites without prior written authorization from the ACS. This restriction explicitly includes, but is not limited to, the integration of ACS content into tools leveraging artificial intelligence (AI), machine learning, large language models, or generative AI technologies and infrastructures.

Copyright © 1996-2025 American College of Surgeons  
633 N Saint Clair St, Chicago, IL 60611-3295

---

**THIRD QUARTER** (Months 7-9)  
**Modern Mentorship in Plastic Surgery:  
Adapting in an Evolving Field**



***Discussion Questions:***

***Objective:***

- Examine how mentorship has adapted to modern challenges, including virtual platforms, hybrid models, and the impact of social media.
- Identify strategies for trainees to maximize mentorship opportunities in today's landscape.

***Articles:***

- Virtual Mentorship is a No-Brainer': The Application of a Virtual Mentorship Programme for Prospective Plastic Surgery Trainees
- Leveraging social media for mentorship in surgery

***Guided Discussion Questions:***

- How has mentorship changed in the last 5–10 years in plastic surgery?
- What are the benefits and limitations of virtual or hybrid mentorship models?
- How can social media or professional networking platforms enhance mentorship?
- How can trainees proactively seek mentorship in a rapidly evolving field?
- What skills or resources do mentors need to effectively support mentees today?

# 'Virtual Mentorship is a No-Brainer': The Application of a Virtual Mentorship Programme for Prospective Plastic Surgery Trainees

Review began 10/21/2024  
Review ended 11/03/2024  
Published 11/05/2024

© Copyright 2024

Motie. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI: 10.7759/cureus.73047

Lucinda Z. Motie <sup>1</sup>

1. Plastic Surgery, St Thomas' Hospital, London, GBR

Corresponding author: Lucinda Z. Motie, lucinda.motie2@nhs.net

---

---

## Abstract

### Aims

This study aimed to evaluate the effectiveness of a virtual mentorship programme in plastic surgery designed for medical students and foundation doctors in the United Kingdom. The programme sought to enhance understanding of common and emergency conditions, provide guidance on the application process for speciality training, and facilitate networking opportunities.

### Materials and methods

The programme consisted of six sessions delivered via Microsoft Teams (Microsoft® Corporation, Redmond, WA) over a four-month period from May to August 2024. Participants completed online pre- and post-mentoring questionnaires. Wilcoxon signed-rank test was used to compare paired data responses.

### Results

Ten participants completed both questionnaires; 90% were medical students, and 10% were foundation-year doctors. There was a significant increase in the understanding of common plastic surgery conditions and emergencies ( $p < 0.05$ ), as well as improved knowledge of the application processes for core surgical training ( $p < 0.05$ ) and higher speciality training ( $p < 0.05$ ). Interest in the speciality significantly increased ( $p < 0.05$ ), and participants were more likely to seek in-person mentorship ( $p < 0.05$ ). The programme was well-received, with 100% rating it as 'excellent' or 'very good'.

### Conclusions

The virtual mentorship programme effectively enhanced foundational knowledge, career preparation, and mentor-mentee relationships. Its implementation is recommended both alone and in combination with traditional face-to-face mentorship.

---

**Categories:** Plastic Surgery, Medical Education

**Keywords:** junior doctor, medical student, mentorship in surgery, plastic and reconstructive surgery, plastic surgery education, virtual mentorship

## Introduction

Plastic surgery is one of the most poorly taught specialities within the undergraduate medical curriculum in the United Kingdom (UK) [1]. With little to no exposure to medical school, those who are interested may find themselves without adequate support networks and mentorship within the field.

Mentorship has long been recognised as a crucial factor in speciality selection and career success in surgery [2]. This is especially true for women, who are less likely to pursue surgical careers due to the scarcity of female colleagues and role models [3]. Similarly, underrepresented minorities are more inclined to consider a surgical career when they encounter role models from similar ethnic backgrounds [4]. The absence of mentorship, coupled with negative societal stereotypes of plastic surgery often portrayed by the media [5], can discourage talented individuals from entering the field, resulting in a loss of promising candidates.

The COVID-19 pandemic saw rapid digital advancements in medical education. In the post-pandemic era, video-conference platforms such as Zoom (Zoom Video Communications, Inc., San Jose, CA) and Microsoft Teams (Microsoft Corporation®, Redmond, WA) remain a fundamental part of delivering modern education [6]. Students appreciate the ease of use and accessibility, irrespective of geographical location, increased student engagement and the ability to record among the many advantages of virtual education and digital platform use [6,7].

The global pandemic also accelerated the digitalisation of mentorship in plastic surgery. Particularly in

America, where sub-internships and letters of recommendation play a key role in securing residency programmes, many medical schools incorporated mentorship into their virtual curricula [8,9]. These initiatives were well received, with one study reporting that nearly 20% of medical students would choose a virtual sub-internship over an in-person one [9]. Furthermore, medical students are increasingly seeking innovative platforms such as social media, especially Twitter, as alternative avenues for mentorship [10-13].

Four years on from the COVID-19 pandemic, the UK remains behind in well-established mentorship in plastic surgery despite widespread advancements in technology. This article presents a qualitative, survey-based study in which predominantly UK medical students interested in plastic surgery participated in a virtual mentorship programme, with the aim to provide guidance and greater insight into this underexposed surgical speciality.

## Materials And Methods

The virtual mentorship programme was designed for medical students and foundation doctors in the UK. Its objectives were to (1) provide didactic teaching on common and emergency conditions in plastic surgery, (2) offer guidance on the application process for Core Surgical Training (CST) and higher speciality training (ST3), and (3) facilitate networking opportunities with junior and middle-grade plastic surgeons. To achieve these aims, the author developed six sessions. The programme was part of an online mentorship-enrichment scheme organised by a national medical society. It was advertised through the society's social media platforms and weekly newsletter, and participants registered via an online form. The programme was carried out using the video-conference platform, Microsoft Teams, over a four-month period from May to August 2024. The programme included a mixture of didactic and case-based teaching sessions, networking opportunities in the form of question and answer, and informal drop-in sessions with a junior surgical trainee (senior house officer) and a higher speciality trainee (registrar).

Participants completed a voluntary, self-reported questionnaire using Google Forms (Google, Inc., Mountain View, CA) before the first session, pre-mentoring, and after the final session, post-mentoring (see Appendix). Responses were collected using a five-point Likert scale (1 = poor; 5 = excellent or 1 = very unlikely; 5 = very likely) or a trichotomous scale (yes, no, maybe). Where relevant, free-response boxes were included to allow the participant to provide additional comments. Microsoft Excel 2013 (Microsoft Corporation®, Redmond, WA) with XLSTAT extension (Addinsoft, Paris, France) was used for data analysis. Wilcoxon signed-rank test was used to compare non-parametric paired data from pre- and post-mentoring responses, with significance set at  $p < 0.05$ .

## Results

### Participant demographics

Ten participants completed both the pre- and post-programme questionnaires, with 90% being medical students and 10% being foundation-year doctors (Table 1).

Stage of training	n (%)
Pre-clinical medical student	1 (10)
Clinical year medical student	8 (80)
Foundation year doctor	1 (10)
Other	0 (0)

**TABLE 1: Participant demographics**

Plastic surgery was not part of their medical school curricula, and 80% of them had no prior mentorship in plastic surgery (Table 2).

	Yes (%)	No (%)	Maybe (%)
Are you interested in plastic surgery?	10 (100)	0 (0)	0 (0)
Is plastic surgery included in your medical school curriculum?	0 (0)	9 (90)	1 (10)
Have you had any prior mentorship in plastic surgery?	2 (20)	8 (80)	0 (0)
Do you think mentorship would affect whether you pursue a career in plastic surgery?	10 (0)	0 (0)	0 (0)

**TABLE 2: Additional pre-programme questionnaire results, data given as n (%)**

### Knowledge of clinical conditions and training pathways

Post-programme, there was a significant increase in understanding of common conditions and emergencies ( $p < 0.05$ ), as well as the application process for CST ( $p < 0.05$ ) and ST3 ( $p < 0.05$ ) (Table 3).

	Pre- or post-programme	1 - Poor (%)	2 - Fair (%)	3 - Good (%)	4 - Very good (%)	5 - Excellent (%)	p-value
How well do you understand common conditions and emergencies in plastic surgery?	Pre	0 (0)	5 (50)	4 (40)	1 (10)	0 (0)	0.007
	Post	0 (0)	0 (0)	1 (10)	5 (50)	4 (40)	
How well do you understand the application process for Core Surgical Training?	Pre	1 (10)	2 (20)	0 (0)	5 (50)	2 (20)	0.023
	Post	0 (0)	0 (0)	1 (10)	3 (30)	6 (60)	
How well do you understand the application process for ST3 Plastic Surgery?	Pre	3 (30)	5 (50)	2 (20)	0 (0)	0 (0)	0.004
	Post	0 (0)	0 (0)	1 (10)	6 (60)	3 (30)	

**TABLE 3: Pre- and post-programme questionnaire results, data given as n (%)**

### Interest in plastic surgery

Interest in the speciality increased significantly from 50% to 100% of participants indicating they were likely or very likely to pursue a career in plastic surgery ( $p < 0.05$ ) (Table 4).

	Pre- or post-programme	1 - Very unlikely (%)	2 - Unlikely (%)	3 - Neither (%)	4 - Likely (%)	5 - Very likely (%)	p-value
How likely are you to pursue a career in plastic surgery in the future?	Pre	0 (0)	1 (10)	4 (40)	3 (30)	2 (20)	0.014
	Post	0 (0)	0 (0)	0 (0)	4 (40)	6 (60)	
How likely are you to seek out in-person mentorship in plastic surgery?	Pre	1 (10)	0 (0)	4 (40)	3 (30)	2 (20)	0.016
	Post	0 (0)	0 (0)	0 (0)	4 (40)	6 (60)	

**TABLE 4: Pre- and post-programme questionnaire results continued, data given as n (%)**

### Mentorship interest

Post-programme, all participants reported they were likely or very likely to seek in-person mentorship, a significant rise from 50% pre-programme ( $p < 0.05$ ) (Table 4). All participants agreed that mentorship would influence their career choice of plastic surgery (Table 2) and expressed support for more virtual mentorship opportunities in plastic surgery (Table 5).

	Yes (%)	No (%)	Maybe (%)
Should there be more virtual mentorship programmes in plastic surgery?	10 (100)	0 (0)	0 (0)

**TABLE 5: Additional post-programme questionnaire results, data given as n (%)**

### Overall programme satisfaction

All participants rated the programme as 'excellent' or 'very good' (Table 6).

	Poor (%)	Fair (%)	Good (%)	Very good (%)	Excellent (%)
How would you rate this virtual mentorship programme?	0 (0)	(0)	(0)	4 (40)	6 (60)

**TABLE 6: Post-programme rating of virtual mentorship programme, data given as n(%)**

## Discussion

The programme was well received with all participants expressing support for more virtual mentorship opportunities in plastic surgery. Interactive features such as polls, quizzes, and breakout rooms were incorporated into the programme and have been shown to enhance engagement and learning outcomes [14]. The virtual format also enabled students from across the country to participate at times convenient to them, eliminating travel costs and reflecting the broader benefits of online learning, as seen in the literature [7]. One participant also commended the use of teleconference platforms for mentorship, stating, '*Mentorship should be a cornerstone of any medical speciality training. With facilities like Zoom and Teams, virtual mentorship is a no-brainer*'.

Virtual mentorship helps minimise the exposure gap created by varying undergraduate curricula across the UK. Similar to reported literature [1], participants had limited prior exposure to plastic surgery before joining the programme. One participant noted how this lack of exposure influenced their career decision-making, '*If I were to get a better idea of what plastic surgery is like, then I would know whether or not it seems like a viable career option for me. As of right now, I've no experience, so couldn't say whether I would like it or not yet*'. After the programme, there was a significant increase in both interest and theoretical knowledge of the speciality. Virtual mentorship can, therefore, provide a foundational understanding of the speciality whilst helping to retain talented potential trainees who might have otherwise been deterred by insufficient exposure.

Exposure to plastic surgery is useful even for those pursuing other specialities. Recognising and managing common plastic surgery conditions such as burns, devascularised limbs, amputations, and flexor sheath infections is relevant to several non-surgical specialities, including general practice and emergency medicine [1]. Diminished exposure may exacerbate practice differences in the future with the potential to adversely affect patient care.

Plastic surgery is one of the most competitive specialities for higher surgical training [15], making it imperative for aspiring trainees to have a clear understanding of the application process. Concerns have been raised by Pasha et al. [16] about the disconnection between perceptions of the competitive national selection process and awareness of what the application involves. The mentorship programme significantly increased understanding of the application process for both junior and higher surgical training. Virtual mentorship provides a solution to this concern, helping prospective trainees better prepare for their careers.

The mentorship programme also facilitated interactions between participants and surgeons at different stages of training, including both junior and higher surgical trainees. This multi-level mentorship structure offered participants deeper insights into the speciality and allowed them to build networks with established professionals in the field. Importantly, this led to the formation of a 'mentorship team', reducing the risk of 'mentorship malpractice', a concept introduced by Chopra et al. [17] to describe the over-reliance on a single mentor and the potential for dysfunctional mentor-mentee relationships. The ease of collaboration through online platforms further reduces the risks of suboptimal mentoring. Additionally, combining virtual mentorship with traditional in-person mentoring could offer a well-rounded approach to combating mentorship malpractice.

Despite the positive feedback, one participant expressed interest in expanding the programme to include in-person mentorship, stating, 'Considering the virtual and long-distance nature of the scheme, there isn't much else that can be done... try and expand into an in-person mentorship scheme too!' This sentiment aligns with findings from Kidess et al. [18], wherein students desired a face-to-face event with practical exercises despite a successful virtual internship day. Whilst virtual mentorship enables a range of opportunities, it is unlikely to fully replace traditional face-to-face mentorship, particularly in a surgical speciality where hands-on skills are essential and difficult to simulate online. Notably, procedural aspects of plastic surgery were not covered in the virtual programme. However, the programme did significantly increase the likelihood of participants seeking in-person mentorship post-programme. Virtual mentorship can, therefore, serve as an introductory experience that fosters interest and encourages participants to explore the field further through in-person experiences.

## Limitations

Whilst findings were significant, the author acknowledges several limitations. Data were collected from a relatively small cohort of participants, making it difficult to generalise the results to a larger population. The participants were a self-selected group with a specific interest in plastic surgery, introducing an inherent selection bias. It is unclear how the virtual mentorship sessions would impact medical students and junior doctors who are undecided or have no prior interest in the field. The self-selection of motivated participants, who actively sought mentorship outside of compulsory education or work, may have excluded individuals with differing levels of interest or awareness of the programme, thereby limiting the diversity of perspectives. An extended timeframe may be necessary to gather longitudinal evidence on career uptake in plastic surgery. Furthermore, the outcomes of virtual mentorship were not compared with traditional in-person mentorship or a control group, which would be necessary to fully evaluate its effectiveness. Future studies should address these limitations to better assess the true impact of virtual mentorship programmes.

## Conclusions

Mentorship is fundamental to career success for aspiring surgical trainees. However, undergraduate curricula in the UK do not favour the field of plastic surgery or its prospective trainees. This study demonstrates the effectiveness of a virtual mentorship programme in providing a strong foundational understanding of the speciality, enabling prospective trainees to better prepare for their careers and fostering meaningful mentor-mentee relationships. Although virtual mentorship is unlikely to fully replace traditional face-to-face mentorship, it offers an innovative and complementary approach that can aid career decision-making and advancement in plastic surgery whilst motivating prospective trainees to seek hands-on experiences. Going forward, we strongly encourage universities and national professional bodies to embrace virtual mentorship programmes and to adopt a hybrid approach to mentorship, similar to the blended learning strategies prevalent in medical education today.

## Appendices

### Pre-programme questionnaire

What year are you in?

Pre-clinical

Clinical year 1

Clinical year 2

Final year

Other

Are you interested in plastic surgery?

Yes

No

Maybe

Is plastic surgery included in your medical school curriculum?

Yes

No

Maybe

Have you had any prior mentorship in plastic surgery?

Yes

No

If you answered yes, please briefly describe what mentorship you have received.

Do you think mentorship would affect whether you pursue a career in plastic surgery?

Yes

No

Maybe

Please expand further on your answer to the above question if you wish.

How well do you understand common conditions and emergencies in plastic surgery?

1. Poor

2. Fair

3. Good

4. Very good

5. Excellent

How well do you understand the application process for Core Surgical Training?

1. Poor

2. Fair

3. Good

4. Very good

5. Excellent

How well do you understand the application process for ST3 Plastic Surgery?

1. Poor
2. Fair
3. Good
4. Very good
5. Excellent

How likely are you to pursue a career in plastic surgery in the future?

1. Very unlikely
2. Unlikely
3. Neither
4. Likely
5. Very likely

How likely are you to seek out in-person mentorship in plastic surgery?

1. Very unlikely
2. Unlikely
3. Neither
4. Likely
5. Very likely

### **Post-programme questionnaire**

How well do you understand common conditions and emergencies in plastic surgery?

1. Poor
2. Fair
3. Good
4. Very good
5. Excellent

How well do you understand the application process for Core Surgical Training?

1. Poor
2. Fair
3. Good
4. Very good

5. Excellent

How well do you understand the application process for ST3 Plastic Surgery?

1. Poor

2. Fair

3. Good

4. Very good

5. Excellent

How likely are you to pursue a career in plastic surgery in the future?

1. Very unlikely

2. Unlikely

3. Neither

4. Likely

5. Very likely

How likely are you to seek out in-person mentorship in plastic surgery?

1. Very unlikely

2. Unlikely

3. Neither

4. Likely

5. Very likely

How would you rate this mentorship programme?

1. Poor

2. Fair

3. Good

4. Very good

5. Excellent

How would you improve this mentorship series?

Should there be more virtual mentorship programmes in plastic surgery?

Yes

No

Maybe

Please expand further on your answer to the above question if you wish.

## Additional Information

### Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

**Concept and design:** Lucinda Z. Motie

**Acquisition, analysis, or interpretation of data:** Lucinda Z. Motie

**Drafting of the manuscript:** Lucinda Z. Motie

**Critical review of the manuscript for important intellectual content:** Lucinda Z. Motie

### Disclosures

**Human subjects:** All authors have confirmed that this study did not involve human participants or tissue.

**Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue.

**Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

## References

1. Bhachoo H, Glossop SC, Matthey LR, et al.: Undergraduate deficits in plastic surgery exposure and awareness of the specialty: a systematic review. *Ann R Coll Surg Engl.* 2024, [10.1308/rcsann.2023.0099](https://doi.org/10.1308/rcsann.2023.0099)
2. Ko CY, Whang EE, Karamanoukian R, Longmire WP, McFadden DW: What is the best method of surgical training?: a report of America's leading senior surgeons. *Arch Surg.* 1998, 133:900-5. [10.1001/archsurg.133.8.900](https://doi.org/10.1001/archsurg.133.8.900)
3. Silva AK, Preminger A, Slezak S, Phillips LG, Johnson DJ: Melting the plastic ceiling: overcoming obstacles to foster leadership in women plastic surgeons. *Plast Reconstr Surg.* 2016, 138:721-9. [10.1097/PRS.0000000000002483](https://doi.org/10.1097/PRS.0000000000002483)
4. Lane JC, Shen AH, Williams R, Gefter L, Friedman L, Zogg CK, Shaughnessy E: If you can see it, you can be it: perceptions of diversity in surgery among under-represented minority high school students. *J Surg Educ.* 2022, 79:950-6. [10.1016/j.jsurg.2022.03.003](https://doi.org/10.1016/j.jsurg.2022.03.003)
5. Farid M, Vaughan R, Thomas S: Plastic surgery inclusion in the undergraduate medical curriculum: Perception, challenges, and career choice-a comparative study. *Plast Surg Int.* 2017, 2017:41. [10.1155/2017/9458741](https://doi.org/10.1155/2017/9458741)
6. Rojas D, Tailor J, Fournier K, Cheung JJ, Rangel C: Zoomification of medical education: can the rapid online educational responses to COVID-19 prepare us for another educational disruption? A scoping review. *Can Med Educ J.* 2023, 14:33-48. [10.36834/cmej.74697](https://doi.org/10.36834/cmej.74697)
7. Wilcha RJ: Effectiveness of virtual medical teaching during the COVID-19 crisis: a systematic review. *JMIR Med Educ.* 2020, 6:e20963. [10.2196/20963](https://doi.org/10.2196/20963)
8. Tucker AB, Pakvasa M, Shakir A, Chang DW, Reid RR, Silva AK: Plastic surgery away rotations during the coronavirus disease pandemic: a virtual experience. *Ann Plast Surg.* 2022, 88:594-8. [10.1097/SAP.0000000000003046](https://doi.org/10.1097/SAP.0000000000003046)
9. Reghunathan M, Dean RA, Hauch A, Reid CM, Gosman AA, Lance SH: Virtual surgical subinternships: course objectives and a proposed curriculum. *Plast Reconstr Surg.* 2022, 149:1032e-40e. [10.1097/PRS.0000000000008992](https://doi.org/10.1097/PRS.0000000000008992)
10. Weber L, Khosravani N: Connecting with the next generation: a medical student's perspective on social media use and plastic surgery. *Plast Reconstr Surg.* 2018, 142:247e-8e. [10.1097/PRS.0000000000004569](https://doi.org/10.1097/PRS.0000000000004569)
11. Wells MW, Chang IA, Furnas HJ, Gatherwright JR: Twitter and plastic surgery: reconstructing traditional concepts of mentorship in the digital age. *J Plast Reconstr Aesthet Surg.* 2022, 75:893-939. [10.1016/j.bjps.2021.11.096](https://doi.org/10.1016/j.bjps.2021.11.096)

12. Friedman LG, Menendez ME: What's important: how social media can foster connectedness—voices from the #OrthoTwitter community. *J Bone Joint Surg Am.* 2021, 105:1152-4. [10.2106/JBJS.20.01738](https://doi.org/10.2106/JBJS.20.01738)
13. Corsini EM, Luc JG, Antonoff MB: Women in thoracic surgery: social media and the value of mentorship. *J Thorac Dis.* 2021, 13:464-72. [10.21037/jtd.2020.04.11](https://doi.org/10.21037/jtd.2020.04.11)
14. Khan RA, Atta K, Sajjad M, Jawaid M: Twelve tips to enhance student engagement in synchronous online teaching and learning. *Med Teach.* 2022, 44:601-6. [10.1080/0142159X.2021.1912310](https://doi.org/10.1080/0142159X.2021.1912310)
15. 2024 Competition Ratios. (2024). Accessed: October 11, 2024: <https://medical.hee.nhs.uk/medical-training-recruitment/medical-specialty-training/competition-ratios/2024-competitio...>
16. Pasha T, Lumley ES, Dwyer-Hemmings L, Fell M: Undergraduate plastic surgery in the United Kingdom: the students' perspective. *J Plast Reconstr Aesthet Surg.* 2020, 73:2086-102. [10.1016/j.bjps.2020.08.086](https://doi.org/10.1016/j.bjps.2020.08.086)
17. Chopra V, Edelson DP, Saint S: Mentorship malpractice. *JAMA.* 2016, 315:1453-4. [10.1001/jama.2015.18884](https://doi.org/10.1001/jama.2015.18884)
18. Kidess M, Schmid SC, Pollak S, Gschwend JE, Berberat PO, Autenrieth ME: Virtual skills-training in urology: teaching at the Technical University of Munich during the COVID-19-pandemic. *Urologe A.* 2021, 60:484-90. [10.1007/s00120-020-01431-2](https://doi.org/10.1007/s00120-020-01431-2)

# Leveraging social media for mentorship in surgery

Alison Baskin, MD, Julie Ann Sosa, MD, MA, FACS\*

Department of Surgery, University of California San Francisco, CA



## ARTICLE INFO

### Article history:

Accepted 27 April 2023

Available online 24 May 2023

## ABSTRACT

Mentorship is a key component of success in surgery that benefits both mentors and mentees. It is associated with increased academic productivity, funding, leadership roles, job retention, and career advancement. Until recently, mentor-mentee dyads have connected through traditional communication channels; however, in an increasingly virtual world, academic communities are adopting new communication methods, including over social media platforms. In recent years, we have witnessed how social media helps effect positive change by facilitating patient and public health initiatives, social movements and campaigns, and professional pursuits. Given its ability to transcend constraints of geography, hierarchy, and time, social media can benefit mentorship, too. Social media helps strengthen preexisting mentorships, identify new mentorship opportunities locally and remotely, and facilitates modern mentorship models, such as team mentorship.

Furthermore, it increases the durability of mentor-mentee relationships and helps expand and diversify mentorship networks, which may especially benefit females and those underrepresented in medicine. Despite the many advantages of social media, it is not a replacement for traditional local mentorship. Herein, we discuss the benefits and risks of using social media for mentorship and propose approaches to optimize the virtual mentorship experience. With best practice guidelines that aim to balance virtual and in-person interactions and provide tailored education to all mentorship levels, we believe mentors and mentees will become more adept in using social media professionally, and these platforms will help foster meaningful connections that ensure mutual fulfillment.

© 2023 Published by Elsevier Inc.

## Introduction

Mentorship is a key component of success in many professional fields, and surgery is no exception. In a mutually beneficial relationship, mentors pass along knowledge, strategy, and acquired experiences to mentees, ensuring ongoing achievement and fulfillment.<sup>1,2</sup> Mentors report greater levels of career satisfaction and promotion from mentoring.<sup>3</sup> Within surgery, mentorship is associated with increased academic productivity, funding, leadership roles, job retention, and advancement of mentors' and mentees' careers.<sup>4</sup>

Until recently, mentors and mentees have connected through traditional communication channels; however, in a world more virtual than ever before, we are rethinking the ways we communicate. Specifically, academic communities have embraced social media as an emerging communication tool, appreciating its ability to transcend constraints of geographic location, hierarchy, and

time.<sup>5</sup> In a short period, we have witnessed the impact of social media within surgery, including the rise of successful patient and public health advocacy efforts, galvanizing movements and campaigns, increased networking opportunities, and the promotion of professional pursuits.<sup>6</sup> Through these initiatives, we have learned that social media can be an effective vehicle to impart change.<sup>6</sup> Mentorship, too, stands to benefit from the acceptance of social media by academic communities.

Browse any popular social media platform to see how it promotes existing mentorships. In a few words and a single click, a mentor can amplify the work of a mentee, celebrate their accomplishments, and make introductions to potential colleagues or collaborators.<sup>1,3</sup> Mentees often reciprocate with words of appreciation for their mentor. In this mutually beneficial exchange, not only is a mentee's work disseminated and their visibility in the academic community increased, but their success is also a positive reflection of their mentor.<sup>1</sup> Recognition as an effective mentor can be important for recruitment or promotion at academic institutions valuing mentorship.

Freed from the constraints of geographic location and time, social media enhances existing relationships by facilitating flexible

\* Reprint requests: Julie Ann Sosa, MD, MA, FACS, 513 Parnassus Avenue, Suite S-320, Box 104, San Francisco, California 94143.

E-mail address: [julie.sosa@ucsf.edu](mailto:julie.sosa@ucsf.edu) (J.A. Sosa);

Twitter: [@alison\\_baskin](https://twitter.com/alison_baskin), [@jasosamd](https://twitter.com/jasosamd)

<https://doi.org/10.1016/j.surg.2023.04.056>

0039-6060/© 2023 Published by Elsevier Inc.

and punctual communication. Mentor-mentee dyads may use simple communication touchpoints—for example, sharing an article or scholarship opportunity or quickly checking in over social media. Desirable attributes in sought-after mentors, including approachability, interest in the mentee, and having time for mentorship, may be more easily demonstrated with social media.<sup>7</sup> As students, residents, and young faculty advance through their training and careers, social media can help sustain valuable mentor-mentee relationships from prior stages through virtual mentorship, allowing both parties to keep each other abreast of new and ongoing professional pursuits.

Social media also provides an avenue for identifying new mentorship. It increases the accessibility mentees have to mentorship by imparting an open, flat structure to the traditional, sometimes intimidating, academic and surgical hierarchy.<sup>1,5,8</sup> Mentees may have greater success finding mentorship given the larger pool of potential mentors and ease of initiating contact that social media offers. Some mentors may have spoken on social media about personal experiences from their training or careers, which may appeal to mentees with similar experiences. Mentorship borne in this way promotes mutual vulnerability, as mentees may be more likely to divulge challenges they face, and mentors may have particularly insightful perspectives and offer more targeted advice informed by a shared experience. This may be especially valuable for females and those underrepresented in medicine facing unique challenges in surgical career development or advancement and in surgical subspecialties with limited diversity. A recent study evaluating social media's role in cardiothoracic mentorship found that social media not only increased female surgeons' access to female mentors, but when compared with other surgical subspecialties, female cardiothoracic surgeons were more likely to report building a larger network of same-sex mentorship pairings with the help of social media.<sup>9</sup>

Through targeted social media groups, affinity group communities, or specific hashtags, mentees at all levels of training may more effectively identify mentors with similar niche interests or who practice in surgical subspecialty fields wrought with ongoing sex or racial bias. Social media may improve the durability of mentorship by transforming brief in-person exchanges, such as those at academic meetings or during training interviews, into longer-term relationships.<sup>8</sup>

As more surgeons embrace social media for professional use, mentorship networks expand and diversify. Telementoring promotes equitable access to high-quality mentorship because mentees are not limited by a potential scarcity of local mentors and can connect with mentors located remotely.<sup>9</sup> Recognizing that mentorship is a critical component to mitigating sex and racial disparities in surgery, social media, too, becomes a valuable tool for increased equity in the field.<sup>2</sup> The underrepresented in medicine mentees disproportionately impacted by a lack of available mentorship at their home institutions are likely to benefit most.<sup>10</sup> However, for mentors from areas or demographics with limited mentorship networks, virtual mentorship may offload some of the work placed upon them.<sup>2,8</sup> Unassisted, these individuals may bear a disproportionate amount of the mentorship burden, which can perpetuate inequity on the faculty level. Furthermore, virtual mentorship is cost-effective and promotes workplace efficiency by saving the money and time frequently required for in-person meetings, which can increase the feasibility of mentorship for both parties.

In many ways, we have adapted our communication within academic surgery to suit today's virtual world. Mentorship, too, has evolved to include more than just the traditional mentor-mentee

relationship. Given the ease of networking on social media, team mentorship, which is becoming increasingly desirable, may be more easily attained.<sup>1</sup> Further, social media allows individuals to give and receive mentorship through indirect relationships. Mentors can disseminate career or training advice on social media platforms to broad audiences (see, for example, Tweetorials and the Association of Women Surgeons #DearIntern initiative). Meanwhile, mentees may solicit advice from open social media forums or affinity group communities where they can receive input from a large audience of peer and senior mentors. Although this type of mentorship does not, and should not, replace traditional mentor-mentee relationships, it augments the mentorship experience by enabling mentees to gain additional perspectives and a greater sense of community engagement and support.

Though social media has many benefits, it is not a replacement for in-person mentorship. Our observations and experiences suggest there is a learning curve to using social media in the academic setting and, especially, learning how to balance virtual and in-person interactions. Therefore, although the surgical community is becoming increasingly comfortable on social media, there are opportunities to develop best practice guidelines to ensure social media enhances and does not hurt preexisting mentorship models across all platforms.

So how can social media be leveraged to optimize the virtual mentorship experience in surgery and complement local mentorship? The answer is not straightforward, and we, too, are working to identify the best approach. First, we must recognize social media's potential risks and downsides. When turning to social media for personal or professional uses, we must be mindful of the permanent trail left behind. Some may argue that encouraging social media use creates yet another task, among a long list of responsibilities, for mentors and mentees. Mentors may fear becoming overwhelmed by mentorship inquiries. Mentees may be unsure of how to best communicate their mentorship needs over social media or worry about their privacy in doing so. And the last thing we want to do is dilute the mentor-mentee relationship by moving these invaluable connections online.

To help mitigate these concerns, we must educate and support mentors and mentees through the adoption and use of social media for mentorship. At the mentor level, guidance on social media should include how to best respond to mentorship requests, how to increase visibility and demonstrate an availability to mentor, and how to promote mentees effectively. As part of academic and career development curricula, trainees and young faculty may be taught how to use social media for professional pursuits, specifically, how to effectively seek out mentorship on these platforms and develop social media profiles appropriately reflecting their academic interests and goals. Mentees should be explicit about what they seek in mentorship, so mentors may more effectively determine whether they can meet these needs. Furthermore, we must ensure that communication is confidential and secure when necessary. Hybrid mentorship formats, featuring both virtual and in-person components (when feasible), may offer the improved accessibility and efficiency of the virtual experience while also providing opportunities for face-to-face interactions to discuss sensitive or confidential matters. Currently, the most popular social media platforms for surgical mentorship are Twitter and Facebook; others include Instagram and LinkedIn.<sup>9</sup> Platforms supporting secure communication between mentor-mentee dyads, widespread dissemination of information and advice, and easy networking are likely to be the most conducive to positive mentorship experiences.

In conclusion, social media helps strengthen preexisting mentorships, identify new ones, and facilitates modern mentorship

models; however, it does not fully replace traditional local mentorship. To optimize the mentorship experience, we must bring intentionality and creativity to the forefront of the virtual mentorship landscape and identify and implement best practices for social media use. We believe that as mentors and mentees become more adept in using social media professionally, these platforms will lessen the demands of quality mentorship, increase the bandwidth of both parties for dedicated participation, and foster meaningful connections to ensure mutual fulfillment.

### Funding/Support

This research did not receive any specific funding from any agencies in the public, commercial, or not-for-profit areas.

### Conflict of interest/Disclosure

The authors have no conflicts of interests or disclosures to report.

### References

1. Chopra V, Vaughn V, Saint S. *The Mentorship Guide: Helping Mentors and Mentees Succeed*. Anne Arbor (MI): Michigan Publishing Services; 2019.
2. Edwards JA. Mentorship of underrepresented minorities and women in surgery. *Am J Surg*. 2021;221:768–769.
3. Chung DH. Society of University Surgeons mentorship: fostering personal relationships. *Surgery*. 2012;152:304–308.
4. Raborn LN, Janis JE. Overcoming the impact of COVID-19 on surgical mentorship: a scoping review of long-distance mentorship in surgery. *J Surg Educ*. 2021;78:1948–1964.
5. Corsini EM, Boeck M, Hughes KA, et al. Global impact of social media on women in surgery. *Am Surg*. 2020;86:152–157.
6. Onyango JM, Bowe SN. Seeing is believing: how social media is challenging physician stereotypes. *J Grad Med Educ*. 2019;11:495–497.
7. Sinclair P, Fitzgerald JE, Hornby ST, Shalhoub J. Mentorship in surgical training: current status and a needs assessment for future mentoring programs in surgery. *World J Surg*. 2015;39:303–313.
8. McLuckey MN, Gold JA, O'Glasser AY, Hingle S, Spencer A, Fick LB. Harnessing the power of medical twitter for mentorship. *J Grad Med Educ*. 2020;12:535–538.
9. Luc JGY, Stamp NL, Antonoff MB. Social media as a means of networking and mentorship: role for women in cardiothoracic surgery. *Semin Thorac Cardiovasc Surg*. 2018;30:487–495.
10. Roberts SE, Shea JA, Sellers M, Butler PD, Kelz RR. Pursing a career in academic surgery among African American medical students. *Am J Surg*. 2020;219:598–603.





---

## FOURTH QUARTER (Months 10-12)

### Mentorship as Sponsorship: Moving from Guidance to Advocacy

#### ***Discussion Questions:***

##### ***Objective:***

- Differentiate mentorship from sponsorship and understand how mentors can actively advocate for mentees.
- Develop strategies for mentees to seek mentorship that includes advocacy and career promotion.

##### ***Articles:***

- Maximizing Your Plastic Surgery Training: Professional Society Career Development Opportunities for Students, Residents, and Fellows
- Inclusive Mentorship and Sponsorship

##### ***Guided Discussion Questions:***

- How does sponsorship differ from mentorship, and why is it important?
- Can you identify examples where mentorship evolved into sponsorship in your experience or observation?
- How can mentors advocate for mentees in ways that open doors for leadership, research, or clinical opportunities?
- What actions can mentees take to encourage mentors to act as sponsors?
- How can the culture of sponsorship be expanded in academic plastic surgery?

# Maximizing Your Plastic Surgery Training: Professional Society Career Development Opportunities for Students, Residents, and Fellows

Emily E. Zona, BS, Tien Vo, BA, BS, Armin Edalatpour, MD, and Jacqueline S. Israel, MD

**Purpose:** Membership in professional societies offers valuable opportunities for personal and professional growth. For aspiring plastic surgeons (including students, residents, and fellows), these societies can support career development by aiding in residency application preparation, subspecialty exploration, research portfolio building, and the development of leadership and advocacy skills. This article highlights the opportunities available for trainees to engage with and advance in professional societies related to plastic surgery.

**Design:** We conducted web-based searches and consulted with plastic surgeons across various subspecialties to compile a list of relevant professional organizations. For each organization, we reviewed their websites and created tables categorizing programs related to leadership development, mentorship, research, and financial awards.

**Results:** We identified 20 professional societies offering opportunities for prospective plastic surgeons. The findings include 78 programs for trainees, ranging from leadership roles and advocacy groups to research funding, organized by category. These organizations provide significant resources that support the success of medical students and residents as they prepare for the next stage of their careers.

**Conclusions:** Engagement in professional societies helps plastic surgery residents and interested medical students build meaningful relationships, gain exposure to the field, and access resources that support research, innovation, and career development. These opportunities may be particularly beneficial for medical students without home plastic surgery programs, as they offer experiences that may otherwise be unavailable. For residents, society involvement fosters mentorship and sponsorship, enhancing fellowship and job applications and facilitating the transition into early career practice.

**Key Words:** professional society, mentorship, leadership, trainee, medical student, resident, surgical education

(*Ann Plast Surg* 2025;00: 00–00)

**S**urgical residency is inherently demanding, with the need to balance clinical responsibilities, research, education, and career development opportunities. Recognizing and utilizing available resources can alleviate some of these challenges. Although aspiring plastic surgeons can often identify local support at their home training institutions, professional

societies play a critical role in shaping career development by providing broader support. In highly specialized fields such as plastic and reconstructive surgery (PRS), these external, national- (and international) level organizations offer a wealth of opportunities that can help level the playing field, enabling trainees to advance professionally and academically, extending beyond the resources of their home institutions.

Professional societies serve as valuable platforms for trainees to connect with mentors, collaborate with peers and cultivate leadership skills. By engaging with professional societies, trainees can expand their networks, stay informed about evolving residency and fellowship application processes, and participate in seminars, workshops, and committee meetings that discuss key issues in advancing the specialty. Many societies also provide targeted initiatives to support trainees, such as discounted or waived membership fees, mentorship programs, research funding, and structured educational curricula. Despite these clear benefits, however, there remains a gap in organized, accessible information about how trainees can actively engage with these societies to maximize their involvement and professional development throughout their training.

The primary aim of this article is to provide systematically researched resource tables for plastic surgery trainees seeking opportunities for engagement with various professional societies related to PRS. To our knowledge, no such resource has been published previously.

## METHODS

### Data Collection

For the purposes of the article, we defined “trainees” as interested medical students, PRS residents, and fellows. We conducted web-based searches to identify professional societies and organizations associated with PRS. To supplement the web-based search, we consulted with plastic surgeons from various subspecialties to compile a comprehensive list of organizations. We included professional societies that are focused on PRS and its subspecialties. We excluded organizations that were inactive, region-specific, or primarily based outside of the United States. The societies were organized into subgroups: academic/education, aesthetic surgery, gender affirming surgery, general plastic surgery, hand surgery, microsurgery/nerve, pediatrics/craniofacial/head and neck surgery, and other.

For each organization, we thoroughly reviewed their websites to identify relevant opportunities for trainees. Information was extracted and organized into detailed tables. All opportunities listed were relevant to medical students or PRS residents or fellows. The data were organized into key categories: leadership development, mentorship programs, research opportunities, and travel awards and scholarships. Leadership development included leadership training initiatives, committee involvement, and advocacy roles. Formal and informal mentorship initiatives designed for trainees were detailed under the mentorship programming category. Research opportunities included information about grants, fellowships, and collaborative research programs. Travel awards and scholarships focused on information regarding financial awards, funding opportunities, and awards for attending annual meetings or conferences. Two authors (E.E.Z. and T.V.) independently reviewed the websites of all identified societies, verified the listed opportunities, and ensured the accuracy and completeness of the data.

Received April 24, 2025, and accepted for publication, after revision July 31, 2025. From the Division of Plastic Surgery, University of Wisconsin School of Medicine and Public Health, Madison, WI.

Emily E. Zona: 0000-0002-7532-4793

Armin Edalatpour: 0000-0001-6283-6581

Conflicts of interest and sources of funding: The authors have no relevant financial or nonfinancial interests to disclose.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author contributions: E.E.Z.: methodology, investigation, writing original draft, project administration; T.V.: investigation, writing original draft; A.E.: methodology, writing review & editing, supervision; J.S.I.: conceptualization, methodology, writing review & editing, supervision, project administration.

Data availability statement: All data supporting the findings of this study are available within the paper and/or corresponding Tables 2–5, and are openly available online. Hyperlinks to the web pages of all opportunities are included in Tables 2–5.

Reprints: Jacqueline S. Israel, MD, Division of Plastic Surgery, University of Wisconsin School of Medicine and Public Health, 600 Highland Avenue, CSC G5/361, Madison, WI 53792. E-mail: israel@surgery.wisc.edu.

Copyright © 2025 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 1536-3708/25/0000-0000

DOI: 10.1097/SAP.0000000000004499

## Data Analysis

The collected data underwent a qualitative analysis for which opportunities were categorized by relevance and scope. A thematic analysis was used to identify common trends in the types of opportunities offered across organizations and subspecialties. The 4 main categories—leadership development, mentorship programs, research opportunities, and travel awards and scholarships—formed the framework for the organization of the data into tables to present the findings. Quantitative analysis involved descriptive statistics including counts and percentages.

This study involved collection of publicly available data and as such, Institutional Review Board (IRB) approval was not required.

## RESULTS

A total of 20 professional societies related to PRS were identified (Table 1). The 20 organizations were organized into specialty subgroups: 3 of 20 (15%) in academic/education, 1 of 20 (5%) in aesthetic surgery, 2 (10%) in gender affirming surgery, 4 (20%) in general plastic surgery, 2 (10%) in hand surgery, 2 (10%) in microsurgery/nerve, 2 (10%) in other, and 4 (20%) in pediatrics/craniofacial/head and neck surgery.

### Leadership and Professional Development

Thirteen of 20 (65%) professional society organizations offered opportunities in the category of leadership and professional development (Table 2). The 21 identified opportunities involved appointments on various committees and councils, regional ambassador positions,

student representatives, and advocacy roles. Three of 21 (14%) programs were directed specifically at medical students, whereas 11 of 21 (52%) were geared toward residents and fellows, and 7 of 21 (33%) programs were open to trainees at all levels.

### Mentorship

Ten formal mentorship programs were identified across 9 of 20 (45%) professional society organizations (Table 3). Two of 10 (20%) programs were directed at medical students, 5 of 10 (50%) were geared toward residents and fellows, and 3 of 10 (30%) of the programs were open to a combination of medical students, residents, and faculty.

## RESEARCH

Twenty-six research opportunities were identified across 10 of 20 (50%) professional society organizations (Table 4). Some opportunities were advertised as salary or research support for residents during dedicated research year(s) during their training programs, others were geared to financially support collaborative, mentored research efforts between faculty and trainees, and the rest were for medical students interested in PRS to join cooperative research teams and assist with active research projects. Approximately two-thirds (17 of 26; 65%) of the research programs and opportunities identified were available to residents and/or fellows only. Three of 26 (12%) programs were specific to medical students, whereas 6 of 26 (23%) of the programs were applicable to all trainees.

### Travel Awards and Scholarships

Over half (12 of 20; 60%) of the professional society organizations offered travel awards and scholarships to trainees (Table 5). Of the 21 awards identified, 6 (29%) programs were directed at medical students, whereas 12 (57%) programs were geared toward residents and fellows, and 3 (14%) programs were open to trainees at all levels. The vast majority of scholarships (20 of 21; 95%) were travel awards to allow trainees to attend annual professional society meetings and conferences.

We identified a total of 78 opportunities for trainees to engage with professional society organizations relevant to PRS. Across all 4 categories, 18% (14 of 78) of opportunities were specific to medical students, 58% (45 of 78) were specific to residents, and 24% (19 of 78) were applicable to all trainees (Fig. 1). The average number of opportunities per professional society organization was 3.9 (SD: 3.0).

## DISCUSSION

### Leadership and Professional Development

Leadership is a quality that is highly sought after among many competitive specialties, but especially in plastic surgery. Students who obtain Alpha Omega Alpha (AOA) membership—representing the top 20% of their medical school class by embodying leadership qualities such as academic achievement, service, and professionalism—have a 21.6% higher probability of successfully matching in PRS residency compared to students who do not hold this leadership status.<sup>1</sup> Leadership opportunities take various forms such as serving as a committee for an academic society or advocating to professional organizations on behalf of one's peers. Cultivating leadership skills allows medical students and residents to learn how to communicate effectively, build meaningful and long-lasting connections with peers and mentors, explore their career interests, and possibly pursue leadership roles in their future careers.

Through the American Society of Plastic Surgeons (ASPS), PRS residents can serve as voting members of various committees (Table 2). Although council and committee roles through ASPS are open to PRS residents and attendings, medical students can engage in national

**TABLE 1.** List of Professional Societies Discussed in This Article by Specialty

Subspecialty	Organization
Academic/education	AAS—Association for Academic Surgery ACEPS—American Council of Educators in Plastic Surgery ASE—Association for Surgical Education
Aesthetic surgery	The Aesthetic Society
Gender-affirming surgery	USPATH—United States Professional Association for Transgender Health WPATH—World Professional Association for Transgender Health
General plastic surgery	AAPS—American Association of Plastic Surgeons ASPS—American Society of Plastic Surgeons PSF—Plastic Surgery Foundation PSRC—Plastic Surgery Research Council
Hand surgery	AAHS—American Association for Hand Surgery ASSH—American Society for Surgery of the Hand
Microsurgery/Nerve	ASPN—American Society for Peripheral Nerve ASRM—American Society for Reconstructive Microsurgery
Other	ACS—American College of Surgeons ASA—American Surgical Association
Pediatrics/Craniofacial/Head and Neck Surgery	ACPA—American Cleft Palate-Craniofacial Association AHNS—American Head and Neck Society ASCFS—American Society of Craniofacial Surgery ASMS—American Society of Maxillofacial Surgeons

**TABLE 2.** Leadership Development Opportunities for Trainees

Subspecialty	Organization	Program	Description	Source
General plastic surgery	ASPS—American Society of Plastic Surgeons	Committee Service	Residents and fellows who are members of ASPS in good standing are allowed to serve on a variety of committees and subcommittees—such as Continuing Education, Diversity & Inclusion, Leadership Development, Legislative Advocacy, and Wellness—that help shape and improve plastic surgery practice in and outside of the United States. Eligibility: plastic surgery residents and fellows	Residents and Fellows Forum Committees <a href="https://www.plasticsurgery.org/for-medical-professionals/community/residents-and-fellows-forum?sub=Committees#content">https://www.plasticsurgery.org/for-medical-professionals/community/residents-and-fellows-forum?sub=Committees#content</a>
		ASPS Residents Council	Plastic surgery residents can serve up to 3 consecutive years on this council to advocate for fellow trainees and assist in developing new projects related to plastic surgery training. Eligibility: plastic surgery residents	ASPS Residents Council <a href="https://www.plasticsurgery.org/for-medical-professionals/community/residents-and-fellows-forum?sub=Residents+Council">https://www.plasticsurgery.org/for-medical-professionals/community/residents-and-fellows-forum?sub=Residents+Council</a>
		ASPS Regional Ambassadors	Residents can serve as regional ambassadors who assist medical students who are interested in pursuing plastic surgery. Eligibility: plastic surgery residents	ASPS Regional Ambassador <a href="https://www.plasticsurgery.org/for-medical-professionals/community/medical-students-forum/regional-ambassadors">https://www.plasticsurgery.org/for-medical-professionals/community/medical-students-forum/regional-ambassadors</a>
	PSF—Plastic Surgery Foundation	PSF Committee Member	Active and candidate members are allowed to apply and be part of the Academic Affairs Council, Clinical Registries Committee, International Scholar Subcommittee, PSF Study Section, Research Oversight Council, Visiting Professors Subcommittee that increases involvement of young plastic surgeon. Eligibility: plastic surgery residents	PSF Committee Listing <a href="https://www.thepsf.org/about-the-psf/committee-listing">https://www.thepsf.org/about-the-psf/committee-listing</a>
		SHARE Global Collaborator	This program offers the opportunity to collaborate with a global network to engage in clinical education and research by offering research opportunities, conferences, mentorship, case discussion, and involvement in global curriculum development. Eligibility: medical students and residents	SHARE Global Collaborators Application <a href="https://plasticsurgery.formstack.com/forms/share_collaborator_application">https://plasticsurgery.formstack.com/forms/share_collaborator_application</a>
Microsurgery/nerve	ASPN—American Society for Peripheral Nerve	ASPN Committee Member	Candidate members are eligible to serve on various committees including Tech, Education, Program, Grants, and Mentorship. Eligibility: residents and fellows with Active member sponsorship	ASPN Constitution <a href="https://peripheralnerve.org/multimedia/files/Bylaws.pdf">https://peripheralnerve.org/multimedia/files/Bylaws.pdf</a>
	ASRM—American Society for Reconstructive Microsurgery	Young Microsurgeons Group (YMG)	Members of YMG serve on ASRM committees and task forces to host panels, plan fellowship forums, and appoint standing positions. Eligibility: residents	Young Microsurgeons Surgeons Group <a href="https://www.microsurg.org/about-asrm/young-microsurgeons-surgeons-group/">https://www.microsurg.org/about-asrm/young-microsurgeons-surgeons-group/</a>

*Continued next page*

**TABLE 2. (Continued)**

Subspecialty	Organization	Program	Description	Source
Gender-affirming surgery	USPATH—United States Professional Association for Transgender Health	Student Representative	Medical students are allowed to serve as a student representative with voting privileges for the USPATH board of directors, which allows multidisciplinary integrations to improve transgender care.	USPATH Board <a href="https://www.wpath.org/uspath">https://www.wpath.org/uspath</a>
		USPATH Board of Directors	All professionals eligible for full membership including residents are allowed to apply to serve on the USPATH board, in which they will be elected by members.	USPATH Board <a href="https://www.wpath.org/uspath">https://www.wpath.org/uspath</a>
	WPATH—World Professional Association for Transgender Health	WPATH Student Initiative	Medical students can serve as the chair or vice chair of the student initiative that allows them to serve as committee and board liaisons.	Student Membership <a href="https://www.wpath.org/student-membership">https://www.wpath.org/student-membership</a>
		Committee Member	Residents are allowed to serve on WPATH committees and join task forces. As a member of a committee, they are allowed to vote.	Membership Information <a href="https://www.wpath.org/MembershipInfo">https://www.wpath.org/MembershipInfo</a>
Pediatrics/craniofacial/head and neck surgery	ACPCA—American Cleft Palate-Craniofacial Association	Committee Member	Medical students and residents are eligible to apply for committee positions including advocacy, awards and scholarships, commission on approval of teams, DEI, education, family resources, management and finance, membership, program task force, and visiting scholar selection.	ACPA Get Involved <a href="https://acpacares.org/get-involved/">https://acpacares.org/get-involved/</a>
		ACPA Advocate	ACPA provides a tool kit for members to support legislation and engage in public policy.	ACPA Advocacy <a href="https://acpacares.org/advocacy/#become-an-acpa-advocate">https://acpacares.org/advocacy/#become-an-acpa-advocate</a>
Hand surgery	AAHS—American Association for Hand Surgery	Candidate Board Member	Candidate members of AAHS are allowed to serve a 1-yr term on the board of directors to represent the perspective of young hand surgeons and will not have voting privileges. Eligibility: medical students and residents in the United States or Canada	By-Laws <a href="https://handsurgery.org/multimedia/files/Bylaws.pdf">https://handsurgery.org/multimedia/files/Bylaws.pdf</a>
Aesthetic surgery	The Aesthetic Society	Committee Member	The Aesthetic Society has 28 committees within the 4 Commissions that overseeing operations within the society, for example Advocacy Relations, Industry Exhibits, and Symposium committee. Eligibility: Residents must be enrolled in the Aesthetic Society Resident Program to apply for a committee position.	Committee Interest Application Form <a href="https://docs.google.com/forms/d/e/1FAIpQLScclasUqLTu4tV1luqTyaNGzp2ODpAFuXd9UV3SGngIff50Lw/viewform">https://docs.google.com/forms/d/e/1FAIpQLScclasUqLTu4tV1luqTyaNGzp2ODpAFuXd9UV3SGngIff50Lw/viewform</a>

Academic/education	AAS—Association for Academic Surgery	Committee Member	Medical students and residents with an active membership status are eligible to apply for committee positions in Basic and Translational Science, Clinical and Health Services Research, Academic Advancement, Technology and Communication Education, Ethics, Finance, Global Affairs, Leadership, Membership, Military, Nominating, Program, Publications, Specialty and possibly a specialty committee or could be due to other comorbidities.	Apply for Membership <a href="https://www.aasurg.org/apply-for-membership/">https://www.aasurg.org/apply-for-membership/</a>
	ACEPS—American Council of Educators in Plastic Surgery	Committee Member	Members of all categories can serve as committee members and attend council functions, though only Active members (teaching faculty plastic surgeons) are allowed to vote. Eligibility: medical students, residents, and fellows	ACEPS Bylaws <a href="https://aceplasticsurgeons.org/About/Bylaws/">https://aceplasticsurgeons.org/About/Bylaws/</a>
		Resident Representative	Current plastic surgery program residents are eligible to be the resident representative to the board of directors and vote on the board decisions. Eligibility: plastic surgery residents who are interested PRS education with sponsorship from a program director or other active member.	Become an ACEPS Member <a href="https://aceplasticsurgeons.org/Membership/">https://aceplasticsurgeons.org/Membership/</a>
	ASE—Association for Surgical Education	Representative	Medical students and residents are eligible for the medical student and resident representative positions to serve as liaisons to the board of directors.	ASE Board of Directors <a href="https://www.surgicaleducation.com/leadership-committee-information/">https://www.surgicaleducation.com/leadership-committee-information/</a>
Other	ACS—American College of Surgeons	Resident and Associate Society Committee	Residents are eligible to join advocacy and issues, communications, education, membership, and associate fellow committees that involve a monthly conference call.	Membership Opportunities <a href="https://www.facs.org/for-medical-professionals/membership-community/resident-and-associate-society/opportunities/">https://www.facs.org/for-medical-professionals/membership-community/resident-and-associate-society/opportunities/</a>
		Medical Student Executive Committee	Medical students in years 2–4 are eligible to serve a 1-yr position in the Medical Student Executive Committee where they will represent their peers and advocate for needs of other medical students.	MSEC <a href="https://www.facs.org/for-medical-professionals/membership-community/medical-students/medical-student-executive-committee/">https://www.facs.org/for-medical-professionals/membership-community/medical-students/medical-student-executive-committee/</a>

**TABLE 3.** Formal Mentorship Programs for Trainees Sponsored by Professional Societies

Subspecialty	Organization	Program	Description	Source
General plastic surgery	ASPS—American Society of Plastic Surgeons	ASPS Mentorship Program (PROPEL)	Professional Resource Opportunities in PRS Education and Leadership (PROPEL) is a team mentorship program consisting of a combination of senior and junior faculty and residents.	PROPEL <a href="https://www.plasticsurgery.org/for-medical-professionals/community/asps-mentorship-program">https://www.plasticsurgery.org/for-medical-professionals/community/asps-mentorship-program</a>
	PSF—Plastic Surgery Foundation	Grant Application Mentoring Session	This annual opportunity allows investigators to meet with experienced grant reviewers and leaders in plastic surgery research to gain valuable insight and feedback on their research proposals.	Grant Application Meeting <a href="https://www.thepsf.org/research/grant-application-mentoring">https://www.thepsf.org/research/grant-application-mentoring</a>
	PSRC—Plastic Surgery Research Council	PSRC Mentorship Program	This program is a 1-yr commitment available to PSRC members that facilitates a mentorship experience at every level of training: medical students, residents, chief residents, fellows, junior faculty, and faculty.	PSRC Mentorship Program <a href="https://ps-rc.org/mentorship/">https://ps-rc.org/mentorship/</a>
Microsurgery/nerve	ASPN—American Society for Peripheral Nerve	Mentorship Program	ASPN's Mentorship Program pairs established members of ASPN with young faculty, fellows, and residents over a 1-yr time commitment. Pairs will meet at the ASPN Annual Meeting and are encouraged to connect via phone and email throughout the year.	Mentorship Program <a href="https://peripheralnerve.org/mentorship/">https://peripheralnerve.org/mentorship/</a>
	ASRM—American Society for Reconstructive Microsurgery	Women's Microsurgery Group (WMG)	As a part of the WMG membership, there is a mentorship program in which microsurgeons in practice who are members of ASRM are paired with residents or medical students. The program is designed to offer perspective and guidance with individualized female mentorship.	Women's Microsurgery Group (WMG) <a href="https://www.microsurg.org/about-asrm/womens-microsurgery-group/">https://www.microsurg.org/about-asrm/womens-microsurgery-group/</a>
		Council Member-in-Training	This is a 1-yr position on the ASRM Council where a candidate member attends all council meetings during the January and July annual meetings to learn the leadership roles of the organization. Travel and housing are covered. Eligibility: Resident in final 2 yr of training	Council Member-in-Training <a href="https://www.microsurg.org/education/awards-and-scholarships/council-member-in-training/">https://www.microsurg.org/education/awards-and-scholarships/council-member-in-training/</a>
Aesthetic surgery	The Aesthetic Society	ASERF Externship Program	This program matches qualified medical students with a member of The Aesthetic Society. Mentors and mentees are encouraged to communicate regularly. Additionally, medical students will have the opportunity to participate in a 5-d observer ship at their mentor's office, assist with a research project, and network at the national meeting.	ASERF Externship Program <a href="https://www.theaestheticsociety.org/medical-professionals/residents-fellows/medical-student-opportunities">https://www.theaestheticsociety.org/medical-professionals/residents-fellows/medical-student-opportunities</a>

Academic/education	Association for Surgical Education	Surgical Education and Leadership Fellowship (SELF)	This 1-yr fellowship seeks to improve teaching, education design, and leadership skills for ASE members interested in surgical education. Participants meet with an advisor 3 times during the fellowship. Eligibility: residents and fellows	SELF <a href="https://www.surgicaleducation.com/self/">https://www.surgicaleducation.com/self/</a>
	ACEPS—American Council of Educators in Plastic Surgery	Plastic Surgery Research, Education, and Preparation Promoting Equity and Diversity (PREPPED)	PREPPED is a program for third-year medical students who identify as underrepresented by race, socioeconomic status, LGBTQ+, and those without a home plastic surgery program. The program provides financial support for students to attend ACEPS Annual Winter Meeting as well as a 3-d intensive boot camp covering plastic surgery principles, application preparation, and sessions on how to succeed on sub-internships.	PREPPED <a href="https://www.plasticsurgery.org/for-medical-professionals/publications/plastic-surgery-resident/news/reflection-on-representation-within-academic-plastic-surgery-the-prepped-experience">https://www.plasticsurgery.org/for-medical-professionals/publications/plastic-surgery-resident/news/reflection-on-representation-within-academic-plastic-surgery-the-prepped-experience</a>
Other	ACS—American College of Surgeons	ACS Clinical Scholars in Residence	This is a 2-yr onsite fellowship that prepares surgical residents for careers in academic surgery by offering one-on-one mentorship with research and health policy experience. Eligibility: US surgery residents who have completed 2 yr of training	ACS Clinical Scholars in Residence <a href="https://www.facs.org/for-medical-professionals/professional-growth-and-wellness/clinical-scholars-in-residence/">https://www.facs.org/for-medical-professionals/professional-growth-and-wellness/clinical-scholars-in-residence/</a>

surgery leadership as committee members in the Association of Academic Surgery (AAS) and the American College of Surgeons (ACS). Medical students can also serve as liaisons between the boards of professional organizations such as the World Professional Association for Transgender Health (WPATH) and the Association for Surgical Education (ASE) as representatives of their peers. In these roles, medical students have the opportunity to collaborate with leaders in academic surgery.

By holding leadership positions, trainees learn to advocate on pertinent issues, engage with mentors on committee projects, and cultivate their unique interests and passions within PRS and medical education more broadly. Leadership is not only an essential quality for someone aspiring to work in an innovative field, but it is necessary for teamwork and builds the foundation for being able to educate and mentor others in the future.

## Mentorship

Mentorship relationships are paramount to the success of medical student applicants into PRS residency programs. One study found that 80% of medical school graduates reported that their mentors influenced their decision to pursue plastic surgery, with 40% expressing a desire to pursue a practice similar to their mentor's.<sup>2</sup> A recent survey study of medical student applicants to a single institution found that students with faculty mentors from both a home and outside institution had 7.4 times the odds of matching into PRS residency than students without faculty mentorship.<sup>3</sup> Perhaps more striking, the study also found that students with dual-institution resident mentorship had 18.5 times higher odds of matching compared with students with no resident mentorship.<sup>3</sup> From a resident perspective, it is known that trainees with mentors do better; that is, mentorship positively influences personal and professional development, enhances patient care, and can increase academic research productivity.<sup>4-7</sup>

A relatively new opportunity for medical students is Plastic Surgery Research, Education, and Preparation Promoting Equity and Diversity (PREPPED), an immersive national educational program for rising fourth-year, underrepresented medical students sponsored by the American Council of Educators in Plastic Surgery (ACEPS) and the Games Society and aimed at providing PRS education and resources. Of the 33 students who completed the PREPPED course in 2022, 72.7% identified as underrepresented in medicine and almost half did not have a home integrated plastic surgery program. These students matched into PRS residency with a 77% match rate (compared to the 74.9% match rate for US seniors nationwide in 2023), and many endorsed that the networking opportunities through PREPPED helped them receive away rotations, interviews, and improve their performance on sub-internships.<sup>8</sup>

Professional Resource Opportunities in Plastic and Reconstructive Surgery Education and Leadership (PROPEL) is another mentorship program, sponsored by ASPS, that uses a team mentorship model with a combination of senior and junior faculty and residents.<sup>9</sup> PROPEL facilitates a meaningful mentorship experience as the group members build relationships throughout a 1-year experience. The mentorship program is structured based on a guidebook, with sample outlines of possible topics to discuss during meetings such as personal and professional career goals, burnout syndrome and wellness, research productivity, and professional reputation.

Other societies, including the Plastic Surgery Research Council (PSRC), the American Society for Peripheral Nerve (ASPN), and The Aesthetic Society, offer formal and structured mentorship programs for trainees (Table 3). The Plastic Surgery Research Council (PSRC) offers a 1-year mentorship program for members at various training levels, from students to senior faculty. The American Society for Peripheral Nerve (ASPN) provides a 1-year mentorship program for young faculty, fellows, and residents, with meetings at the ASPN Annual Meeting and

**TABLE 4.** Select Research Funding Opportunities That Are Sponsored by National Organizations

Subspecialty	Organization	Program	Description	Source
General plastic surgery	PSF—Plastic Surgery Foundation	PSF Aesthetic Plastic Surgery Research Grant	This grant for up to \$25,000 for 1 yr supports aesthetic/cosmetic plastic surgery research. The foundation promotes innovative research that involves anything from preliminary data collection to advanced discoveries that change patient care dynamics. Eligibility: plastic surgery residents	PSF Aesthetic Plastic Surgery Research Grant <a href="https://www.thepsf.org/research/grants-program/aesthetic-plastic-surgery-research-grant">https://www.thepsf.org/research/grants-program/aesthetic-plastic-surgery-research-grant</a>
		PSF Combined Pilot Research Grants	PSF joins efforts of various other plastic surgery organizations to provide a \$15,000 grant for 1-yr pilot studies focused on plastic surgery research. Eligibility: must be a full-time research or clinician where the research takes place, and trainees need a sponsor letter from an active member of the partner organization (AAHS, ASMS, ASPN, AAPS, ACEPS, ASRM, CSPS, PSRC)	Combined Pilot Research Grants <a href="https://www.thepsf.org/research/grants-program/combined-pilot-research-grants">https://www.thepsf.org/research/grants-program/combined-pilot-research-grants</a>
		PSF-Directed Research Grant	PSF provides a grant of up to \$50,000 for 2 yr to conduct research that will assess the safety of breast implants. Eligibility: active, candidate, international, or associate ASPS or someone who is sponsored by an active ASPS member at the respective institution	PSF-Directed Research Grant Breast Implant Safety <a href="https://www.thepsf.org/research/grants-program/directed-research-grant-breast-implant-safety">https://www.thepsf.org/research/grants-program/directed-research-grant-breast-implant-safety</a>
		National Endowment for Plastic Surgery	This grant supports research for up to \$50,000 for 2 yr that allows for improvement of patient care and practice of care that can be achieved in the next few years. Eligibility: active, candidate, international, or associate ASPS or someone who is sponsored by an active ASPS member at the respective institution	National Endowment for Plastic Surgery <a href="https://www.thepsf.org/research/grants-program/national-endowment-for-plastic-surgery">https://www.thepsf.org/research/grants-program/national-endowment-for-plastic-surgery</a>
		Pilot Research Grants	This \$15,000 great for 1-yr pilots supports residents who are pursuing a novel research project which can lead to further grant attainment in the future.	Pilot Research Grants <a href="https://www.thepsf.org/research/grants-program/pilot-research-grants">https://www.thepsf.org/research/grants-program/pilot-research-grants</a>
		Research Fellowship	By giving up to \$50,000 for 1 yr of salary support, this grant promotes career development and research training. Eligibility: plastic surgery residents and fellows	Research Fellowship <a href="https://www.thepsf.org/research/grants-program/research-fellowships">https://www.thepsf.org/research/grants-program/research-fellowships</a>
		Graduate Research Scholarship	This scholarship provides tuition for plastic surgeons to pursue an advanced degree in research with up to \$25,000. Eligibility: plastic surgery residents and fellows	Graduate Research Scholarship <a href="https://www.thepsf.org/research/awards-scholarships-and-fellowships/graduate-research-scholarship">https://www.thepsf.org/research/awards-scholarships-and-fellowships/graduate-research-scholarship</a>
		Clinical Research Leaders Scholarship	This scholarship provides awardees up to \$2500 to attend research programs around the country to improve their skills in clinical/translational/outcomes research. Eligibility: plastic surgery residents and fellows	The Plastic Surgery Foundation Clinical Research Leaders Scholarship Application <a href="https://www.thepsf.org/documents/Awards/Clinical-Research-Leaders-Scholarship-Guidelines.pdf">https://www.thepsf.org/documents/Awards/Clinical-Research-Leaders-Scholarship-Guidelines.pdf</a>
		SHARE Research Grant	Surgeons in Humanitarian Alliance for Reconstruction Research and Education offers \$2000 grants to conduct research. Eligibility: residents	SHARE Research Grant Application <a href="https://plasticsurgery.formstack.com/forms/share_research_grant_application">https://plasticsurgery.formstack.com/forms/share_research_grant_application</a>

Microsurgery/nerve	ASRM—American Society for Reconstructive Microsurgery	Medical Student Research Grant	Medical students between M1–M2 years are allowed to apply for a \$2500 3-mo summer research grant that they will present at the ASRM Annual Meeting and submit as a report for the ASRM newsletter. Eligibility: US or Canadian medical student with a PI who is an active member of ASRM and a sponsor institution/program that will fund the travel and accommodations for attending the ASRM Annual Meeting.	Medical Student Research Grant <a href="https://www.microsurg.org/research/medical-student-research-grant/">https://www.microsurg.org/research/medical-student-research-grant/</a>
Gender-affirming surgery	WPATH—World Professional Association for Transgender Health	WPATH Student Initiative Research Grant	WSI supports student-led research by providing small research awards to student enrolled in graduate level programs who conduct research in transgender health. Eligibility: Details are limited to members of WPATH.	Student Membership <a href="https://www.wpath.org/student-membership">https://www.wpath.org/student-membership</a>
Pediatrics/craniofacial/ head and neck surgery	AHNS—American Head and Neck Society	AHNS Pilot Grant	This a 1-yr \$20,000 scholarship to support basic, translational, or clinical research projects in head and neck oncology. Eligibility: medical students and residents residing in the United States or Canada	AHNS Research Grants <a href="https://www.ahns.info/research/grants/">https://www.ahns.info/research/grants/</a>
		AHNS Alando J. Ballantyne Resident Research Pilot Grant	This a 1-yr \$20,000 scholarship to support basic, translational, or clinical research projects in head and neck oncology. The top ranked pilot project is honored the Ballantyne Award. Eligibility: medical students and residents residing the United States or Canada	AHNS Research Grants <a href="https://www.ahns.info/research/grants/">https://www.ahns.info/research/grants/</a>
		AHNS Presidential Awards	These are 1-yr \$10,000 awards that are given to researchers who focus on either novel therapeutic targets and combinations in head and neck cancer, understanding treatment resistance in head and neck cancer, or defining and implementing value-based care in head and neck cancer. Eligibility: medical students and residents who residents in the United States or Canada	AHNS Research Grants <a href="https://www.ahns.info/research/grants/">https://www.ahns.info/research/grants/</a>
		AHNS Thyroid Cancer Survivors' Association Award for Thyroid Cancer Research Grant	This award is given to researchers who are 10 yr or less from obtaining a terminal degree or entering fellowship training and are in the early stages of investigation. Eligibility: AHNS members in good standing that are medical students or ENT residents	AHNS Research Grants <a href="https://www.ahns.info/research/grants/">https://www.ahns.info/research/grants/</a>
		AHNS/AAO-HNSF Young Investigator Research Development Award	This award supports head and neck neoplastic disease research with up to \$50,000 dispersed among up to 2 yr. One award is given annually. Eligibility: fellows with AHNS membership	AHNS Research Grants <a href="https://www.ahns.info/research/grants/">https://www.ahns.info/research/grants/</a>
	ASMS—American Society of Maxillofacial Surgeons	Research Grant	This grant is awarded to residents or research fellows who are interested in maxillofacial surgery. The recipient must complete a summary of their project submitted to ASMS within a year of receiving the award. The grant amount and number of awards is determined once all applications are reviewed. Eligibility: residents or fellows who have a PI who is an active member of ASMS and provides a letter of sponsorship	Research Grant Application <a href="https://maxface.org/Awards/research-grant.cgi">https://maxface.org/Awards/research-grant.cgi</a>

Continued next page

**TABLE 4. (Continued)**

Subspecialty	Organization	Program	Description	Source
Hand surgery	ASSH—American Society for Surgery of the Hand	Resident and Fellow Fast Track Grant	This grant is for research related to hand surgery that can be completed in a short period with little resources. The award of \$5000 for 1 yr can only be given to one applicant per academic department. Eligibility: hand surgery fellows or surgical residents at ACGME or RCPSC accredited programs	Resident and Fellow Fast Track Grant <a href="https://www.assh.org/afsh/s/resident-and-fellow-fast-track-grants">https://www.assh.org/afsh/s/resident-and-fellow-fast-track-grants</a>
		Basic Science Grants	In collaboration with the American Foundation for Surgery of the Hand, this grant supports those who are interested in piloting a basic science project that can be completed in a short period with little resources. The award is up to \$60,000 total given over 1 or 2 yr. Eligibility: residents, fellows, and non-ASSH members who have an active ASSH member listed as an investigator or sponsor for the project	Basic Science Grants <a href="https://www.assh.org/afsh/s/basic-science-grants">https://www.assh.org/afsh/s/basic-science-grants</a>
Aesthetic surgery	The Aesthetic Society	Interim Research Grants	This grant is awarded quarterly to society members and trainees with sponsors who are interested in aesthetic surgery. The grant amount is allocated based on project budget requests. Eligibility: Aesthetic Foundation member, Aesthetic Society members, residents/fellows/non-members who have a sponsor who is a member	Apply For a Research Grant <a href="https://www.theaestheticfoundation.org/apply-for-funding/research-grants/apply-for-a-research-grant">https://www.theaestheticfoundation.org/apply-for-funding/research-grants/apply-for-a-research-grant</a>
		Cooperative Research Externship	This entirely online program organizes a team of up to 5 medical students interested in aesthetic research to join cooperative research teams and assist with active research studies. Eligibility: Medical students who attend a school with or without a plastic surgery program	Cooperative Research Externship <a href="https://www.theaestheticfoundation.org/apply-for-funding/externship-program">https://www.theaestheticfoundation.org/apply-for-funding/externship-program</a>
Academic/education	AAS—Association for Academic Surgery	AAS/AASF Trainee Research Fellowship Awards	This award provides \$30,000 for an eligible resident or fellow to pursue a 1-yr research position with an AAS member. The scholarship may provide salary support or cover costs related to the research. There are 4 different research fellowship awards offered involving different areas of focus including global surgery, basic science/translational research, clinical outcomes and health services, and education. Eligibility: Residents or fellows who are members or candidate members of the AAS who are currently enrolled in an accredited training program and have completed at least 2 yr of postgraduate training in a surgical discipline.	AAS/AAF TRF Awards <a href="https://www.aasurg.org/aas-aasf-trf-awards/">https://www.aasurg.org/aas-aasf-trf-awards/</a>

ASE—Association for Surgical Education

Multi-Institutional  
Research Submissions

ASE Surgical Education Research Committee provides a grant to promote research projects in at least 3 separate locations to improve surgical education.

Eligibility: Residents may apply if they have a sponsor letter from an ASE member or from the program director of their research institution

This 1-yr, home-site fellowship is designed to help those interested in education research gain skill to conduct and report educational research studies. The home site pays \$3000 for tuition.

Eligibility: residents and fellows

ASE Foundation allocates one \$10,000 grant, 2 \$2500 grants, and 10 \$500 grants for research projects related to surgical education. There are 2 Giant Robot grants \$25,000 each for research projects related to robotic surgery training and outcomes.

Eligibility: Residents must be in a full-time clinical or research position at an institution or in a society that allows them to gain IRB approval. They must also provide a sponsorship letter from an active ASE member at their institution.

This research award is for \$60,000 over 2 yr to cover costs related to research to encourage the pursuit of academic surgery. The research can be completed outside of the United States/Canada.

Eligibility: residents in general surgery or a surgical specialty who have completed at least 2 yr of training in the United States or Canada

Multi-Institutional Research Grant  
<https://www.surgicaleducation.com/multi-institutional-research-grant/>

SERF

<https://www.surgicaleducation.com/surgical-education-research-fellowship-overview/>

CESERT Pyramid Grant Application  
<https://www.surgicaleducation.com/cesert-pyramid-grant-application/>

ACS Resident Research Scholarships  
<https://www.facs.org/for-medical-professionals/professional-growth-and-wellness/scholarships-fellowships-and-awards/resident-research/>

Other

ACS—American College  
of Surgeons

ACS Resident  
Research Scholarships

Surgical Education Research  
Fellowship (SERF)

CESERT Pyramid Grant

year-round connections. The Aesthetic Foundation Externship Program matches medical students with mentors for 1-year mentorship, a 5-day observership, and research opportunities, plus a \$3500 scholarship and free registration for The Aesthetic MEET. Structured and funded mentorship programs like these positively contribute to the professional growth, skill development, and successful career progression and transition of trainees.

## Research

Students who have matched into plastic surgery residency in recent years have a higher number of research publications than in prior years. Applicants who successfully matched into PRS residency had, on average, 34.7 abstracts, presentations, and publications and 8.6 research experiences according to the 2024 National Resident Matching Program data.<sup>10</sup> These numbers have grown exponentially since 2007.<sup>11</sup> With the transition of Step 1 to pass/fail scoring, the increasing number of applicants, and increasing academic achievement among applicants, integrated PRS residency programs consequently began to emphasize other metrics to a greater degree to assess applicant competitiveness.<sup>12,13</sup> As such, the amount of research productivity among medical student applicants to PRS residency has skyrocketed. Likewise for residency programs, many surgical residency programs have optional or mandatory research years as a response to increasing emphasis on research productivity for fellowship applications. The Accreditation Council for Graduate Medical Education (ACGME) requirements state that PRS residents must participate in two or more scholarly activities, which may include research activities, publications, presentations, and education.<sup>14</sup> Dedicated research years can have an impact on future career trajectory including competitiveness for fellowships programs, professorship ranks, opportunities to hold board positions, and obtaining National Institute of Health (NIH) funding for future work.<sup>15</sup>

Although various institutions have their own funding sources, awareness of these national opportunities for research support can help expand research and create longitudinal relationships. Most external PRS research grants at the resident level are provided by the PSF and are often in collaboration with other organization partners (Table 4). Research opportunities for residents are often exclusive to members of these professional societies or require sponsorship from a current member. Residents with specific research interests may seek grant opportunities for specialized societies such as the American Society of Maxillofacial Surgeons (ASMS), American Society for Surgery of the Hand (ASSH), and The Aesthetic Society. Grants range from \$2000 to \$50,000 and are typically allocated over 1 or 2 years. Although a majority of these plastic surgery research opportunities are only available at the residency level, ASRM provides a short-term research experience for medical students in the summer between their first and second years, which guarantees them the opportunity to present their work at the society's annual meeting.

The research opportunities facilitated by professional society organizations allow for early-career exploration, fundamental research training, longitudinal collaborative partnerships, and funding resources for trainees. Research is an investment of time and finances, but it also demonstrates one's dedication to the field and improving upon the current practice standards.

## Travel Awards and Scholarships

Most of the professional societies relevant to PRS have annual conferences across the United States during which there are opportunities for collaboration, research discussions and presentations, networking, and continuing education. Although attending these meetings can be productive and beneficial for medical students and residents, the cost of attendance can oftentimes be a barrier to entry. Although most organizations offer discounted or sometimes free registration fees for annual meetings for trainees, the expenses related to transportation,

**TABLE 5.** Travel Awards and Scholarship Opportunities

Subspecialty	Organization	Program	Description	Source
General plastic surgery	AAPS—American Association of Plastic Surgeons	AAPS Resident Travel Award	This award covers travel, housing, and registration to attend the AAPS annual meeting for a plastic surgery resident.	AAPS Resident Travel Award <a href="https://aaps1921.org/Awards/Resident-Travel.cgi">https://aaps1921.org/Awards/Resident-Travel.cgi</a>
		Cannon Student Scholarship	To foster interest in plastic surgery, this award sponsors a minimum of 25 medical students to attend the AAPS annual meeting by providing registration, meals, and two nights hotel stay. Eligibility: Medical students in years 2 and 3 who did not submit an abstract to the meeting	Cannon Student Scholarship <a href="https://aaps1921.org/Awards/cannon.cgi">https://aaps1921.org/Awards/cannon.cgi</a>
	ASPS—American Society of Plastic Surgeons	ASPS/PSF Resident Travel Scholarships	This scholarship of \$1400 each allows nine plastic surgery residents the opportunity to attend Plastic Surgery the Meeting through coverage of registration, travel, and lodging costs. Eligibility: Plastic surgery residents	Resident Travel Scholarships <a href="https://www.plasticsurgerythemeeting.com/residents/travel-scholarship">https://www.plasticsurgerythemeeting.com/residents/travel-scholarship</a>
		Women in Plastic Surgery Resident Travel Scholarship	This scholarship of \$2000 each offers 4 residents the opportunity to attend the WPS Symposium. Scholarship winners also have the opportunity to present their abstracts in the form of oral presentations at the conference.	WPS Resident Travel Scholarship <a href="https://www.plasticsurgery.org/for-medical-professionals/education/events/wps-symposium/travel-scholarship">https://www.plasticsurgery.org/for-medical-professionals/education/events/wps-symposium/travel-scholarship</a>
Microsurgery/nerve	ASRM—American Society for Reconstructive Microsurgery	Medical Student Travel Grant	This award covers 3 nights hotel lodging and \$500 toward travel expenses for medical students interested in attending the ASRM annual meeting.	Medical Student Travel Grant <a href="https://www.microsurg.org/education/awards-and-scholarships/medical-student-travel-grant/">https://www.microsurg.org/education/awards-and-scholarships/medical-student-travel-grant/</a>
		Women's Microsurgery Group Travel Scholarship	With the goal of fostering early interest in reconstructive microsurgery, this travel award provides women medical students or residents that opportunity to attend the ASRM annual meeting and the Women's Microsurgery Group reception. The scholarship covers travel to the ASRM annual meeting, hotel for up to 4 nights, and ASRM registration fees. Eligibility: Female medical students or residents interested in pursuing reconstructive microsurgery	Women's Microsurgery Group Travel Scholarship <a href="https://www.microsurg.org/education/awards-and-scholarships/womens-microsurgery-group-travel-scholarship/">https://www.microsurg.org/education/awards-and-scholarships/womens-microsurgery-group-travel-scholarship/</a>

Pediatrics/craniofacial/head and neck surgery	AHNS—American Head and Neck Society	Combined Otolaryngology Spring Meetings (COSM): Medical Student Travel Awards	The goal of this award is to encourage career exploration among first- and second-year medical students by providing complimentary registration to COSM meetings, \$250, and other meet and greet events during the conference.	Medical Student Travel Awards <a href="https://cosm.md/cosm-travel-award/">https://cosm.md/cosm-travel-award/</a>	
		COSM: American Otological Society Resident Research Travel Award	This award of \$2000 is given to a resident who was selected to present their abstract as an oral presentation.	American Otological Society Resident Research Travel Award <a href="https://cosm.md/awards/">https://cosm.md/awards/</a>	
		COSM: Triological Society (TRIO) Travel Awards	These awards of \$750 each help to offset travel expenses incurred to attend the Triological Annual Meeting at COSM Eligibility: Medical student, resident, or fellow selected for podium or poster presentation residing outside of the meeting's host city	Triological Society (TRIO) Travel Awards <a href="https://cosm.md/awards/">https://cosm.md/awards/</a>	
Hand surgery	ASMS—American Society of Maxillofacial Surgeons	ASMS Resident Scholar Program	This award provides up to \$1200 for plastic surgery residents interested in pursuing a career in craniomaxillofacial surgery to attend the annual scientific meeting. Eligibility: plastic surgery resident in the last 2 yr of their training	ASMS Resident Scholar Program <a href="https://maxface.org/Awards/Resident-Scholar-Program.cgi">https://maxface.org/Awards/Resident-Scholar-Program.cgi</a>	
		AAHS—American Association for Hand Surgery	Annual Meeting Travel Scholarship Program	This program supports attendance at the AAHS Annual Meeting by providing \$1000 to cover travel expenses and meeting registration. Eligibility: Members of AAHS currently enrolled in a residency or fellowship program or active military duty	Annual Meeting Travel Scholarship Program <a href="https://handsurgery.org/Travel-Scholarships.cgi">https://handsurgery.org/Travel-Scholarships.cgi</a>
		ASSH—American Society for Surgery of the Hand	Annual Meeting Scholarships	These scholarships of \$2000 support travel and registration expenses associated with attending the Adrian E. Flatt Residents and Fellows Conference in Hand Surgery as well as the Annual Meeting of the ASSH. These awards include the Daniel C. Riordan Award, Vincent R Hentz Scholarship, and Mary S Stern Fellowship Fund. Eligibility: Residents, fellows, and active-duty military surgeons	Annual Meeting Scholarships <a href="https://www.assh.org/annualmeeting/s/registration/discount-programs/scholarship">https://www.assh.org/annualmeeting/s/registration/discount-programs/scholarship</a>
Aesthetic surgery	The Aesthetic Society	The Aesthetic Foundation Residents and Fellows Travel Scholarship	The Aesthetic Society awards 25 travel scholarships of \$2000 each to residents and fellows to help offset the costs of travel, hotel, and other expenses related to attending The Aesthetic Meet.	The Aesthetic Foundation Residents and Fellows Travel Scholarship <a href="https://www.theaestheticsociety.org/medical-professionals/residents-fellows/aesthetic-foundation-residents-and-fellows-travel">https://www.theaestheticsociety.org/medical-professionals/residents-fellows/aesthetic-foundation-residents-and-fellows-travel</a>	

*Continued next page*

**TABLE 5. (Continued)**

Subspecialty	Organization	Program	Description	Source
Academic/education	AAS—Association for Academic Surgery	AAS/AASF Fall Courses Award	This award offers complimentary registration for the Fall Courses, a \$1,000 travel stipend, and a 1-yr AAS membership. Eligibility: Residents, fellows, or faculty-level attendees who personally identify as underrepresented in surgery	AAS/AASF Fall Courses Award <a href="https://www.aasurg.org/fall-courses-travel-grant/">https://www.aasurg.org/fall-courses-travel-grant/</a>
		Senior Medical Student Travel Award	This travel award of \$500 each allows 6 selected medical students who are interested in pursuing careers in academic surgery to attend the Academic Surgical Congress. Eligibility: Senior medical students receiving their medical degree between January and July 2025 who are considering a career in academic surgery.	Senior Medical Student Travel Award <a href="https://www.aasurg.org/awards/student-awards">https://www.aasurg.org/awards/student-awards</a>
		AAS/AASF Student Diversity Travel Award	This award is presented to 3 female or underrepresented minority medical students to provide complimentary AAS membership for 1 yr, registration to the Academic Surgical Congress, a \$500 travel stipend, and up to 3 nights hotel accommodation for the meeting.	AAS/AASF Student Diversity Travel Award <a href="https://www.aasurg.org/awards/travel-grants-visiting-professorships/student-diversity-travel-grant/">https://www.aasurg.org/awards/travel-grants-visiting-professorships/student-diversity-travel-grant/</a>
	ACEPS—American Council of Educators in Plastic Surgery	ACEPS Annual Meeting Travel Scholarship	This travel scholarship includes registration to ACEPS meeting, meals, and a two-night hotel stay. Eligibility: Medical students years 1–4	ACEPS Annual Meeting Travel Scholarship <a href="https://aceplasticsurgeons.org/Meeting/Scholarship/">https://aceplasticsurgeons.org/Meeting/Scholarship/</a>
	ASE—Association for Surgical Education	Visiting Scholar Fellowship	This grant of up to \$2500 allows ASE members to visit other surgical training programs in the United States to foster collaboration between programs such as education or research initiatives. Eligibility: residents and fellows	Visiting Scholar Fellowship Application <a href="https://www.surgicaleducation.com/visiting-scholar-fellowship-application/">https://www.surgicaleducation.com/visiting-scholar-fellowship-application/</a>
		ASE DEI Underrepresented in Medicine Scholarship	This scholarship aims to promote the values of diversity, equity, and inclusion by offering a range of \$500–\$2000 to support the professional development of trainees interested in surgical education to attend the ASE Annual Meeting.	ASE DEI Underrepresented in Medicine Scholarship Application <a href="https://www.surgicaleducation.com/ase-dei-urim-scholarship-application/">https://www.surgicaleducation.com/ase-dei-urim-scholarship-application/</a>

Other	ACS—American College of Surgeons	ACS Leadership and Advocacy Summit Resident Travel Award	This scholarship covers up to \$500 of the cost of attendance, housing, and transportation for the annual Leadership & Advocacy Summit, with special consideration for first time attendees and candidates in their last year of residency. Eligibility: residents	ACS Leadership and Advocacy Summit Resident Travel Award <a href="https://www.facs.org/for-medical-professionals/conferences-and-meetings/leadership-and-advocacy-summit/resident-travel-award/">https://www.facs.org/for-medical-professionals/conferences-and-meetings/leadership-and-advocacy-summit/resident-travel-award/</a>
		International Exchange Scholars Program	This scholarship provides a stipend and airfare for the purpose of traveling abroad for a reciprocated exchange scholarship program for various host countries to promote international relations. Eligibility: ACS Resident members	International Exchange Scholar Program <a href="https://www.facs.org/for-medical-professionals/membership-community/resident-and-associate-society/opportunities/iep/">https://www.facs.org/for-medical-professionals/membership-community/resident-and-associate-society/opportunities/iep/</a>

accommodations, and meals can prohibit trainee engagement. Our research identified numerous travel awards and scholarships for trainees to attend annual professional society meetings and conferences (Table 5).

The American Association of Plastic Surgeons (AAPS) offers one of the most robust medical student scholarship programs, the Cannon Student Scholarship, which offers free registration, meals, and hotel lodging to at least 25 medical students per year to attend the AAPS Annual Meeting. ASPS and PSF offer 9 resident travel scholarships of \$1400 to attend Plastic Surgery The Meeting. AAHS and ASSH also support resident attendance at their annual meetings, with travel awards of \$1000 and \$2000, respectively. Furthermore, certain scholarships are targeted specifically to underrepresented trainees, such as the Association for Academic Surgery's (AAS) Student Diversity Travel Award, which is presented to 3 underrepresented medical students and provides a complimentary 1-year society membership, registration to the annual meeting, up to 3 nights hotel accommodation, and a \$500 travel stipend.

### What's The Catch? Potential Barriers to the Accessibility of These Opportunities

The primary aim of this paper is to provide a comprehensive resource for medical students and residents to reference when discerning opportunities for personal and professional development. We identified dozens of ways to engage in professional organizations related to PRS, from committee involvement to bidirectional mentorship to grant funding. The generosity of professional societies in their dedication to trainee education and development cannot be emphasized enough. However, in the review of these opportunities, questions about allocation, accessibility, and adequacy inevitably arise. For instance, professional society membership is frequently a requirement to apply for engagement opportunities within the organization, but with some annual membership fees of a couple hundred dollars annually, cost may prohibit some trainees from even applying. Furthermore, dates and deadlines for many opportunities are unclear on society websites, with many stating, “application closed,” without a contact email or timeline of when the next cycle opens for applications. Additionally, the number of trainees outnumbers the opportunities available; thus, accessing a committee position, travel award, or mentorship program can be competitive. For example, 576 medical students and 720 residents registered for PSTM in 2024, but there were only 9 resident travel scholarships available.<sup>16</sup>

Although our results are limited to content found on professional society websites, there are many opportunities publicized on social media platforms such as Operation Diversify Plastic Surgery (Instagram @operation\_diversify\_plastics) and PRS MedEd, an initiative focused on medical student education through their Virtual Curriculum and EXPLORE program. Although opportunities promoted on social media platforms may not be affiliated with a professional society, they offer significant benefits to students who become involved. We recommend that students follow these social media accounts to stay up-to-date on opportunities for meaningful engagement in the field, whether through lecture series, virtual journal clubs, mentorship programs, and much more.

### Limitations

This study is limited due to reliance on public, Internet-based materials, which may not have captured all available opportunities. Some organizations may have programs that are not publicly listed or described on their websites. Data from smaller or region-specific organizations may not have been included. Furthermore, we concentrated on opportunities within the United States, with less emphasis placed on organizations with an international scope. In some cases, information

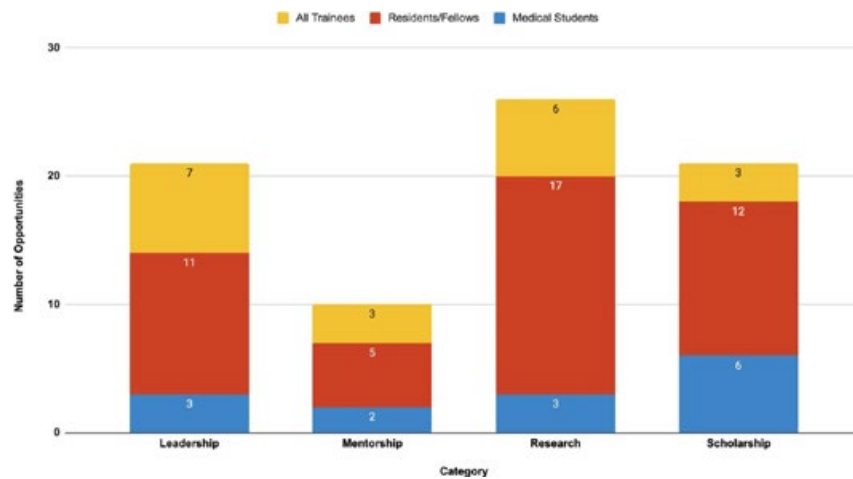


FIGURE 1. Summary of professional society opportunities for trainees.

about opportunities for engagement was only available to members, thus restricting access to that information.

## CONCLUSION

Engagement with national professional society organizations provides invaluable opportunities for PRS trainees at all stages, including medical students, residents, and fellows. Through leadership development, formal mentorship programs, research opportunities, and financial support to attend conferences and courses, these societies offer pathways for professional growth, networking, and skill development. For medical students, particularly those without access to home PRS programs, these opportunities can bridge gaps in mentorship and research opportunities. We strongly encourage trainees to pursue resources and support available through professional societies, as these organizations play a crucial role in helping the future leaders in PRS thrive in their careers and propel the field forward.

## REFERENCES

1. Elemosho A, Sarac BA, Janis JE. The law of diminishing returns in the integrated plastic surgery residency match: a deeper look at the numbers. *Plast Reconstr Surg Glob Open*. 2024;12:e5937.
2. Barker JC, Rendon J, Janis JE. Medical student mentorship in plastic surgery: the mentee's perspective. *Plast Reconstr Surg*. 2016;137:1934–1942.
3. Lopez CD, Khoo KH, Girard AO, et al. Mentorship is critical. *Ann Plast Surg*. 2023;90(6S):S645–S653.
4. Sambunjak D, Straus SE, Marušić A. Mentoring in academic medicine. *JAMA*. 2006;296:1103–1115.
5. Wingard DL, Garman KA, Reznik V. Facilitating faculty success: outcomes and cost benefit of the UCSD National Center of Leadership in Academic Medicine. *Acad Med*. 2004;79(Supplement):S9–S11.
6. Myers PL, Amalfi AN, Ramanadham SR. Mentorship in plastic surgery: a critical appraisal of where we stand and what we can do better. *Plast Reconstr Surg*. 2021;148:667–677.
7. Janes LE, Kearney AM, Taub PJ, et al. The importance of mentorship in shaping the careers of academic leaders in plastic surgery. *Plast Reconstr Surg*. 2022;150:224–232.
8. Reghunathan M, Sendek G, Blum J, et al. Plastic Surgery Research, Education, and Preparation Promoting Equity and Diversity (PREPPED): Match Outcomes. In: *AAPS 2024 Annual Meeting Abstracts: Oral Presentations*. Plastic & Reconstructive Surgery—Global Open; 2024.
9. American Society of Plastic Surgeons. ASPS Mentorship Program. 2025. ASPS Mentorship Program. Available at: <https://www.plasticsurgery.org/for-medical-professionals/community/asps-mentorship-program>. Accessed January 2, 2025.
10. The National Resident Matching Program. Charting Outcomes™: Characteristics of U.S. MD Seniors Who Matched to Their Preferred Specialty: 2024 Main Residency Match®. August 20, 2024. Available at: <https://www.nrmp.org/match-data/2024/08/charting-outcomes-characteristics-of-u-s-md-seniors-who-matched-to-their-preferred-specialty-2024-main-residency-match/>. Accessed January 4, 2025.
11. The National Resident Matching Program. Match Data. Available at: <https://www.nrmp.org/match-data/>. Accessed January 4, 2025.
12. Fijany AJ, Zago I, Olsson SE, et al. Recent trends and future directions for the integrated plastic surgery match. *Plast Reconstr Surg Glob Open*. 2023;11:e5053.
13. Asghari A, Hines E, Mochamuk J, et al. Update on the selection criteria of plastic surgery residents. *Ann Plast Surg*. 92(5S Suppl 3):S327–S330.
14. Accreditation Council for Graduate Medical Education. Program Requirements, FAQs, and Applications. Available at: <https://www.acgme.org/specialties/plastic-surgery/program-requirements-and-faqs-and-applications/>. Accessed January 4, 2025.
15. McGraw JR, Amro C, Niu EF, et al. The role of dedicated research training in promoting academic success in plastic surgery: analysis of 949 faculty career outcomes. *Plast Reconstr Surg Glob Open*. 2023;11:e4996.
16. American Society of Plastic Surgeons. Attendee Profile: plastic surgery the meeting. September 2024. Available at: <https://www.plasticsurgerythethemeeting.com/about/attendee-profile>. Accessed January 2, 2025.

# Inclusive Mentorship and Sponsorship



Kamali Thompson, MD, MBA<sup>a</sup>, Erica Taylor, MD, MBA<sup>b,\*</sup>

## KEYWORDS

• Inclusive Mentorship • Sponsorship • Hand Surgery • Diversity • Equity • Inclusion

## KEY POINTS

- Barriers to inclusive mentorship center upon the current mindset of prospective mentors and potential obstacles to building a relationship with a mentee of a different background.
- Specific barriers fall into six categories: (1) traditional views of success, (2) lack of validation, (3) focus on rescue, (4) diminished value of achievements, (5) mixed goal agreement, and (6) mixed motivations.
- Solution-based approaches must be accepted by the medical community to bridge gaps within the surgical field and form inclusive mentoring relationships.
- The medical community can look to pioneering organizations that have leaned into the complex work of diversity, equity, and inclusion for additional support, insight, and resources.

## THE EVOLUTION OF MENTORSHIP

Mentorship, which is simplistically defined as the process of guidance being passed from one individual with more experience to another with less experience, has been considered a core component across all our medical and surgical specialties. Its roots are often traced to the character of Mentor in the *Odyssey* (Homer), a text that details Odysseus' perilous journey following the Trojan War. In this narrative, the old friend Mentor appears and provides support and guidance during various trials of the plot. Fast forward centuries later, the art of mentoring—and the critical need for mentorship—continues to exist today as a central aspect of one's own personal and professional success.

One can only imagine the challenges faced by Odysseus and his family are not the same as the workplace or academic needs that warrant intentional mentorship today. That said, the principles are similar. Over the last several decades, we have watched mentorship evolve from an organic connection between two individuals who may share similar goals, vision, interests, or assignments, to a more structured process that was

initially assigned in the workplace to help certain groups become aware and accustomed to professional politics. As the concept of mentoring spread to a more universal approach, with medical students, trainees, and faculty all being asked to identify mentors, we have seen the term “mentorship” being used with so much regularity that even Odysseus himself would be shocked. In fact, in academic settings and societies, awards are given to recognize the best mentors and faculty promotion decisions consider how many individuals a candidate for promotion has mentored over his/her tenure. Accordingly, we have seen an increase in individuals desiring mentors across all medical professional designations, as well as a rise in individuals seeking to become mentors to others. As a byproduct, often touted as the next step to mentorship, sponsorship also became popularized as the next phase. The goal of sponsorship has been to take the benefits of mentorship (guidance) into the decision-making environments (advocacy) to promote and publicly support the mentee. One adage is that sponsorship is bringing someone into a room, figuratively, without them having to be there.

---

The authors have nothing to disclose.

<sup>a</sup> Temple University Hospital, Philadelphia, PA, USA; <sup>b</sup> Duke University School of Medicine, PO Box 1726, Wake Forest, NC 27587, USA

\* Corresponding author.

E-mail address: [erica.taylor@duke.edu](mailto:erica.taylor@duke.edu)

Hand Clin 39 (2023) 43–52

<https://doi.org/10.1016/j.hcl.2022.08.012>

0749-0712/23/© 2022 Elsevier Inc. All rights reserved.

Downloaded for Anonymous User (n/a) at West Virginia University-Charles C Wise Library from ClinicalKey.com by Elsevier on October 21, 2025. For personal use only. No other uses without permission. Copyright ©2025. Elsevier Inc. All rights reserved.

With that amount of attention, there is controversy over whether mentorship is truly organic and intrinsic, or if it should be constructed and manufactured. *Is one born a mentor? Does everyone need a mentor? What makes a “good” mentor?* Many have explored, and postulated, various criteria for effective mentoring, including knowledge in the subject matter, proven success, benevolence, directness, and communication skills (including an ability to listen). Considering the potential impact mentorship and sponsorship can have on personal and professional experiences, it is important to execute them with care so that the results of these touchpoints are positive and productive. However, what has not been readily explored and promoted, is the importance of *inclusive mentoring*. We have asked, *is mentorship available to everyone in the same quantity and the same quality? If not, why not?* In this article, we will dive deeper into the concept of inclusive mentorship and sponsorship, and their inextricable link to areas of diversity, equity, and inclusion in our professions. We will set the stage using Orthopedic Surgery as the example field, given its designation as one of the least diverse medical specialties with extremely low numbers of female and minority resident, fellows, and attendings despite decades of efforts. Inclusive mentorship and sponsorship provide the opportunity to bridge these gaps.

## MENTORSHIP AND SPONSORSHIP IN THE TWENTY-FIRST CENTURY

The concept of mentorship has been in existence for centuries and is accepted into the academic zeitgeist as a core principle and offering to learners and faculty. As entry into medical school, residency, fellowship, and the job market become more competitive, applicants look for guidance to enhance their chances to achieve their goals. This has resulted in the establishment of many formal mentoring programs and has increased the popularity of individual one-on-one mentorship. Furthermore, students with less experience or resources in the medical field are theoretically provided an opportunity to reach an even playing field with their counterparts with this guidance from more experienced individuals who have reached a certain stage of achievement.

Guidance and advocacy come in various formats. The advent of the internet and social media has expanded the possibilities, resulting in greater reach and visibility. When students in the high school, college, and medical school phases can see themselves represented by aspirational figures, and can communicate with or follow these

individuals virtually, there is a certain provision of confidence and the knowledge their goals can indeed be realized. This visual representation of physicians from underrepresented demographics and the expanded formats have encouraged the call for more diversity in relatively homogenous fields, such as Orthopedic Surgery.

Another method of providing productive guidance to mentees is developing formal peer-support programs. Formal programs not only foster interest by sharing knowledge and teaching mentees about their passions, but it allows them to connect with mentors who have been identified as committed to the process. Mentors are connected directly with mentees. Mentees belonging to formal programs can feel more comfortable reaching out, asking questions, and building a relationship with a more experienced individual. Another nuance of the formal programs is the provision of expectations for both the mentor and the mentee to support the cultivation of a healthy, productive connection. This is different from the more organic approach to mentorship where expectations may not be clearly delineated.

Regardless of format, the most effective mentors bestow guidance toward professional opportunities and are truly invested in the success of the protégé. On the track to residency, professorship, or leadership, mentors should have the capacity to elevate. Sponsorship requires the additional step of advocacy. They carry the responsibility of guiding their pupil, promoting their positive contributions and attributes amongst colleagues, and truly advocating for the path forward at decision-making tables.

In [Fig. 1](#), the general phases of mentorship are outlined, highlighting components of mentorship and sponsorship. Importantly, inclusive mentorship is identified and defined as mentoring across differences. Revisiting the question, *is mentorship available to everyone in the same quantity and the same quality*, chances are the responses to our inquiry will be mixed. The idea of inclusion is relatively new and many in positions of power are becoming more aware of the opportunities for creating an environment of belonging in our academic and clinical settings. Although there is rarely intent for disparate guidance and advocacy, those realities do exist and are borne out in the experiences, stories, and concerns of our diverse learners and faculty clinicians. Inclusive mentoring highlights the need of all mentors to be well-versed in the areas of stereotype threat, which is the contextual challenge in which individuals believe they are at risk of conforming to stereotypes about their social or demographic group. In addition, inclusive mentors recognize and circumvent issues



Fig. 1. Phases of mentorship.

of bias and microaggressions. Lastly, inclusivity in this realm will ensure that the mentees have equitable access to the benefits of mentorship.

Indeed, it is human nature to intuitively search for mentors who share similar identity characteristics. However, for those who arguably could benefit the most from mentorship within orthopedic surgery, numbers of similar appearing mentors in academia are scarce. As a result, it is vital for physicians of all identity domains to avail themselves as mentors for members of diverse groups, with intent and inclusivity. Inclusive mentorship can elevate underrepresented populations in medicine and create intercultural relationships that can also benefit the relationships we have with our diversifying patient populations.

#### DEMOGRAPHICS IN ORTHOPEDIC SURGERY

Although Hand Surgery brings together teams from General Surgery, Orthopedic Surgery, and Plastic Surgery, Orthopedic Surgery is one of the most competitive medical specialties with a rapidly increasing number of applicants annually, yet stagnant progress in the area of diversity.<sup>1</sup> Thus, we will lean on the data from Orthopedic Surgery to show the case for inclusive mentorship. Despite the influx of applicants, Orthopedic Surgery continues to be one of the least diverse surgical specialties regarding sex and ethnicity.<sup>2-4</sup> Underrepresented minorities are defined by the Accreditation Council for Graduate Medical Education (ACGME) as African Americans, Latinos, and Native Americans/Alaskan natives. Within Orthopedic Surgery, Latinos/Hispanic, Black, American Indians, and Native Hawaiian/Pacific Islander physicians represent 2.2%, 1.9%, 0.4%, and 0.2%, respectively.<sup>5</sup> These statistics are drastically disproportionate to the overall US population of 18.7% Latinos/Hispanics, 14.2% African Americans/Black, 2.9% American Indian and

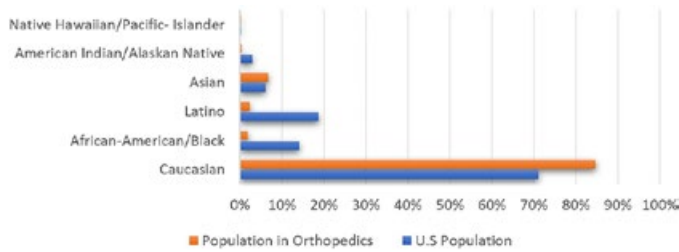
0.4% Pacific Islander<sup>5</sup> according to the 2020 census (Fig. 2).

Regarding sex, females currently represent 51% of all medical students. However, females only comprised 15.3% of residents and fellows, and 6.5% of American Academy of Orthopaedic Surgeons (AAOS) membership in 2019.<sup>6,7</sup> In fact, Acuña and colleagues analyzed trends in the annual percentage of women and determined it will take 217 years to obtain an equal proportion of men and women if Orthopedic Surgery continues growing at its current rate.<sup>8-14</sup>

Statisticians believe by 2045 current minorities in the United States will become the majority population, further solidifying the need for more diversity among health care professionals. In order to bridge this gap, inclusive mentorship and sponsorship are vital for the underrepresented demographics of Orthopedic Surgery. Mentors serve as a reminder of the achievable success. Mentors can also provide guidance with preparation and recruitment to residency programs and job placement. Furthermore, mentors can also serve as advocates to ensure their mentees receive appropriate opportunities. Finally, physicians in mentorship roles can assist when mentees experience common feelings of rejection, isolation, and sadness. Promoting inclusive mentorship and sponsorship is the next step to pushing the needle further within Orthopedic Surgery.

#### ACADEMIC PATHWAY DISPARITIES

To appreciate the necessity of inclusive mentorship, as well as the tools to incorporate it, it is prudent to acknowledge and understand the disparities that exist in an individual's pathway to surgery. From application to entry into a first job or leadership position, there are numerous obstacles and stacked odds that can be overcome by effective mentorship (guidance) and



**Fig. 2.** Race and ethnicity in orthopedic surgery compared with 2020 US population.

sponsorship (advocacy) when done in an intentional manner.

### **Existing Disparities between Resident Applicants**

With a startling match rate of 60% in 2022 (1,470 applicants for 875 positions), applicants strive for optimal preparation before entering the match process.<sup>15</sup> The highest United States Medical Licensing Examination (USMLE) scores and clerkship grades are encouraged. In addition, achieving Alpha Omega Alpha (AOA) status and an outstanding medical student performance evaluation (MSPE) can increase the odds of matching. There is an ongoing struggle to diversify applicants because of existing disparities seen with these residency application requirements.

Eugia and colleagues conducted a study in 2022 identifying commonalities in residents in surgery. They found residents in surgical specialties were less likely to come from disadvantaged backgrounds or have a family median income <\$75,000. Students from disadvantaged backgrounds had a 50% decreased chance of entering the surgical field.<sup>16–22</sup> They also saw a family median income >\$75,000 was associated with a higher NBME shelf exam score, increasing the ability to match into surgery. As NBME scores are positively correlated to USMLE scores, these findings expose the difficulty of matching into a surgical residency if an applicant stems from a disadvantaged background.<sup>16,23</sup>

High clerkship grades are required for an induction into Alpha Omega Alpha Honor Society. As a result, this inevitably affects the number of underrepresented minorities in AOA. The available literature already highlights the majority of Alpha Omega Alpha Honor medical society members are not Underrepresented Minority (URM) students.<sup>24</sup> The MSPE can also be disadvantageous for the URM student. The MSPE details a student's performance and sums up his/her tenure in one adjective (outstanding, excellent, very good, and good). Low and colleagues<sup>25</sup> showed independent of USMLE step scores, URM students had a lower

chance of obtaining a description by the better superlatives.

The last step of the application process is the interview. In 2016, the average Orthopedic Surgery applicant applied to a median of 65 programs (range 21–88) and was offered a median of 15 interviews (range 15–25).<sup>26</sup> In-person interviews presented an additional financial burden on medical students, requiring many to take out additional loans.<sup>26</sup> Beginning in the era of COVID-19, virtual interviews presented new challenges of finding the perfect lighting, camera quality, and background. While removing the financial burden of an in-person interview, virtual interviews may still put some students at a disadvantage if they do not have the proper technology to make a great first impression with a residency program.

In summary, each aspect of the resident application process possesses risk for significant disparities between applicants of various demographics, especially those from a lower socioeconomic status (SES). Although the implementation of a holistic review of resident applicants has improved the number of underrepresented applications and matches, mentorship is one of the key differences between students who go matched and unmatched.<sup>27</sup>

### **The Impact of Limited Resources and Mentorship**

Ulloa and colleagues reported a series of survey responses on the experience of African American and Latino surgeons. They found entry into medicine with a structured plan and appropriate mentorship versus an unstructured experience relying on self-discovery was strongly related to childhood SES.<sup>28</sup> Surgeons from a lower SES were completely unaware of whom or when to ask for assistance. Surgeons from a lower SES also noted unequal academic preparation before beginning medical school. Most importantly, the participants described significant struggles before finding mentorship. Many did not understand the nuance of critical decisions made along their career paths.

***The Effects of Bias on a Resident's Psyche***

Aryee and colleagues completed a study among 504 residents in multiple specialties examining the relationship between mentorship, feelings of isolation, and withdrawal. The authors found residents with greater access to mentorship displayed significantly decreased feelings of isolation.<sup>29</sup> Minority trainees experienced more challenges when executing orders and female trainees reported more instances of being labeled as staff with a lower training level (physician assistant, nurse, and lab tech) Ulloa and colleagues<sup>28</sup> surveyed African American and Latino surgeons who all described feeling isolated and/or working twice as hard to achieve equal recognition because of the color of their skin. Barnes and colleagues<sup>30</sup> found female surgical trainees experience more frequent, severe and stressful microaggressions. These feelings can be difficult to process and can lead toward changing residencies or leaving medicine altogether. This can negatively affect the course of a resident's career, as well as the workflow of the hospital. Mentorship can teach residents how to combat challenges these obstacles.

***Elevation into Leadership Positions***

Mentorship and sponsorship are also imperative for elevation into positions of influence and power. In 2019, female medical students outnumbered men at 50.5% percent of the student population.<sup>31</sup> However, in that same year, according to an AAOS survey, 6.5% of 29,613 Orthopedic surgeons identified as women. Several residency programs have never hired a female resident.<sup>32</sup> In 2020, only 12.9% of women comprised residency and fellowship positions.<sup>31</sup> A study by Bi and colleagues<sup>32</sup> in 2022 found 27% of women are assistant program directors, 11% are program directors, 9% are division chiefs, 8% are vice chairs and only 3% are chairs among the 161 Orthopedic Surgery programs in the country. Having women and underrepresented minorities in leadership roles is essential to recruiting and retaining a diverse demographic of orthopedic surgeons. In addition, the Orthopaedic Diversity Leadership Consortium (ODLC) has identified the opportunities for empowerment of diversity leaders, including additional support, strategy development, education, and resources for the roles, that increase effectiveness in driving organizational change.

**BARRIERS TO INCLUSIVE MENTORSHIP**

Given the numerous proven areas of disparate opportunity, why is inclusive mentorship not

promoted, discussed, or used? There are several barriers prohibiting inclusive mentorship to be widely accepted. These barriers center upon the current mindset of prospective mentors and potential obstacles to building a relationship with a mentee of a different background. We have separated these barriers into 6 categories: (1) traditional views of success, (2) lack of validation, (3) focus on rescue, (4) diminished value of achievements, (5) mixed goal agreement, and (6) mixed motivations (Fig. 3).

**Traditional views of success** are commonplace. In fact, as an example, Orthopedic Surgery has a very specific stereotype well known among medical students who announce they are interested in Orthopedic Surgery. These students will often get comments to solidify stereotypes that successful Orthopedic surgeons must have brawn and a certain pedigree. In addition, to be viewed as a successful applicant, many programs focus on number of publications, AOA status, and USMLE scores as surrogate markers. This mindset can deter potential mentors from forming meaningful relationships with mentees who do not meet these benchmarks or stereotypes and are from different backgrounds. This barrier is also encountered by faculty as well. Often, the templates used to guide promotion advancement (publications, society leadership, and awards) are used to determine whether a faculty surgeon is on track to be "successful." Interestingly, it is rare that our mentees or junior faculty are asked to define what success means to them. The medical community needs to expand the definition of success. For example, innovation, entrepreneurship, community service, investment in family and nonacademic personal achievement goals are also experiences that enhance skills as a physician and overall human being.

**Lack of validation** is another barrier to inclusive mentorship that is unfortunately experienced by many in Surgery, especially women and underrepresented minorities. Making excuses and invalidating one's experiences can be shown with common phrases like "it's not them... it's you," "oh, that's just the way they are", "that happens to everyone", or "perhaps you're too sensitive." Invalidation of experiences can negatively affect one's confidence and trust in authority figures who could have or currently serve as a mentor. Furthermore, imposter syndrome can be exacerbated when one's own trusted confidants and mentors minimize the magnitude of microaggressions. It is a well-known fact that minority students and physicians often suffer from imposter syndrome which has been correlated with depression



**Fig. 3.** Barriers to inclusive mentorship in orthopedic surgery.

and anxiety.<sup>33,34</sup> Lack of validation can further contribute to this phenomenon.

Another barrier is a presumptuous **focus on rescue** that many mentors lead with during their interactions. There is an assumption that all diverse mentees need to be pulled up to break through some sort of metaphorical glass ceiling. Although this may certainly be the case, it should not be assumed. There are many individuals who are at a place or position that brings them satisfaction and joy and they seek mentorship to optimize their success. By enforcing that the mentee “aim bigger” and “break barriers,” we may apply undue stress on diverse individuals who are more interested in being provided equitable choice and opportunity in their current environment. Mentees generally have the grit, internal drive, and intelligence necessary to excel. They simply require an additional resource, including advisors with expertise and the ability to serve as an advocate.

**Diminished value of achievements** is a barrier that is often employed unknowingly. This involves pervasive “rising star” mentality and language. Even when an individual has gained several promotions, achieved his/her personal definition of success, and has excelled as a leader, they continue to be viewed as a “rising star,” implying that they are still subordinate, or have incompletely arrived. This is a form of infantilizing that many diverse individuals are subject to when being addressed or discussed by majority counterparts. There is no clear consensus on when someone is no longer “potential” or “young” or “rising,” but there should be some thoughtfulness when that terminology is used in describing minorities or women in professional settings. In surgical specialties, there is also no consensus based on using this language and it is unclear whether it is the individual’s faculty appointment level, choice of social circles, level of society committee involvement, or the personal characteristics or identity that contribute to the infinite subordinate designation. It can be demeaning unintentionally, at which point the mentor or sponsor should be receptive to that feedback. It is the role of sponsors to advocate for their mentees in the form of speaking high and appropriate praises. If the

mentee is frequently demoted or demeaned when discussed, it will be hard for colleagues to recognize their value and to treat them as equal peers.

The barriers to **mixed goal agreement** and **mixed motivation** refer to reasons for mentoring outside of altruism and connection. Mentorship roles, especially toward underrepresented populations, are at times sought after for academic promotion or professional/social media prestige instead of an actual invested interest in the individual. It can be damaging for the mentees to partner with mentors who are not truly serving their best interests. Eventually, the lack of true interest comes to light and can skew the view of our profession. Mentors should be equally committed to the mentorship process for learners and faculty of all backgrounds. The goals and expectations for the relationship will be individualized and that should be discussed toward the beginning of the interactions. There are indeed bidirectional benefits of the relationship, but without some substance behind the exchange, authenticity can be challenged.

### NOW WHAT? APPROACHES TOWARD INCLUSIVE MENTORSHIP

We have outlined the evolution of mentorship, reviewed disparate experiences along the pathway, and identified real barriers to inclusive mentorship and sponsorship. The good news is that there are ways to mitigate these barriers and provide equitable mentorship experiences for all interested parties.

#### *Embrace Differences*

A solid first step is for us as a medical community to become comfortable working in a mentoring capacity with people from different backgrounds and communities. An ideology that has quickly gained traction over the past few decades is incorporating cultural humility and social determinants of health in medical education. After the US Department of Health and Human Services created the first review of ethnic and socioeconomic health care disparities, training on care for patients of various backgrounds began to become incorporated into the curriculum.<sup>35</sup> These curriculums familiarize future physicians with potential patient populations, as well as colleagues from diverse demographics who can serve as future mentors. We do not know what we do not know, so opening oneself to education on different cultures and identities is paramount for effective relationship formation.

### ***Practice Humility***

---

A healthy mentorship relationship is a bidirectional learning experience. Gone are the days when information is just passed from one older person to a younger person as a finite transaction. In fact, mentoring can occur at any chronological age, and position/power level does not always imply who is the provider or recipient of the mentoring. As such, all mentors must practice humility, as many mentees are already leaders and teachers, with amazing experiences to share. Our own intellectual and professional templates should not serve as the absolute benchmarks for success. Further, active listening should be employed with space made for the mentees to have a voice and influence. Mentors must also be able to recognize talent without fear of uplifting a mentee who has a nontraditional skillset. Furthermore, we must listen to the mentees' experience, allow them to feel validated, and create an avenue specific to that experience.

### ***Empower***

---

We described the “rescue” mentality as a barrier to true inclusive mentorship. The key to mitigation of this barrier is moving away from the “mentor as hero” narrative, and rather emphasizing the empowerment of the mentee. There is real value in encouraging mentees to take back control of situations or opportunities. Mentors can tap into their internal confidence and guide individuals through the complex political landscape that often plagues our clinical and academic environments. In addition, mentors can lead by equipping their learners or colleagues with the tools for in-the-moment action when microaggressions occur and, as a next step, can be active sponsors by advocating for increased respect and belonging in the workplace. This requires that mentors become better-versed in the frameworks used to optimize professionalism and navigate crucial conversations. When these tools are recognized and brought into play, we can shift from an escape-approach to a thrive-approach in our mentorship interactions.

### ***Learn About Cognitive Biases***

---

Our brain employs a multitude of cognitive biases that allow us to survive threats, perceived and real. Understanding the fine line between healthy survival use of biases, and the biases that can cause harm and loss of opportunity is critical for mentors and sponsors. For example, *anchoring bias* is the use of preexisting data as a reference point for all subsequent data. This can alter the decisions we make and influence the potential of others. In

mentoring, this shows up when we compare individuals to an existing idea of what a surgeon—or leader—should look, sound, and behave. The antiquated prototype is the benchmark, and all other individuals are compared with that. *Confirmation bias*, on the contrary, causes us to seek out information and data that confirm our preexisting ideas to the point that we even ignore contrary information. This is frequently employed for diverse individuals at all levels of the surgical education and academic pathway. If a mentee is considered an “academic risk,” or if a faculty peer mentee is labeled as “difficult,” then any behavior that supports that narrative will be sought out and emphasized to confirm what was already believed, regardless of any performance, achievements, or skills that suggest the contrary. Of note, being academically risky or difficult are attributes disproportionately applied to diverse individuals. Another bias, known as the *framing bias*, is based on making decisions based on the way the information is presented, rather than based on the facts alone. This can impede effective sponsorship. How a mentee is discussed (what frames are used) impacts their pathway.

There are many more cognitive biases that we put in play, and they have been extensively studied. The more we educate ourselves about our cognitive biases, which we all have, and how they may manifest to the detriment of others, the better mentors will be at validating the experiences of diverse mentees and recognizing when the biases are entering our relationships.

### ***Co-Create the Future***

---

We have discussed the importance of breaking through traditional views of success in our mentorship relations. Another way to navigate through this area is to co-create the future with your mentee. Many surveys, focus groups, analyses, and exit interviews focus on the past, and sometimes the present: *what was, what is, what went well, and what is going wrong*. Rarely do we ask our mentees what an ideal future state would look like to them. By communicating with the mentees about their own views and visions of success, an inclusive future state of our profession can be created as a collaborative endeavor. With this approach, we will avoid some of the “hit and miss” iterations that can occur when majority populations decide what is best for others without any shared decision-making or dialogue in the process, apply the intervention, and then spend extensive time exploring why it did not work out. The co-creation process is not only more effective but confers levels of respect and belonging that

excites both the mentor and mentee, thus strengthening the interaction.

### ***Promote Resources for Mentorship***

Many steps have already been taken to improve diversity, decrease biases, and foster mentorship. These resources, whether didactic courses or organizations, should be promoted by mentors and used as instruments to support success in the inclusive mentorship experience. For example, in Orthopedic Surgery, organizational pioneers who focus on these areas include the J. Robert Gladden foundation and the Ruth Jackson Orthopaedic Society. The J. Robert Gladden foundation named after the first African-American certified by the American Board of Orthopedic Surgery in 1949, was created in 1998. With the mission of increasing diversity in Orthopedic Surgery, mentorship is a key focus in JRGOS.<sup>36</sup> The creation of the annual JRGOS networking luncheon at the AAOS meeting, in-person and social media Q&A sessions, and financial aid provided for research and review courses has helped the 600 members.<sup>36</sup> Lastly, JRGOS members have been leaders in diversity, equity, and inclusion literature in Orthopedic Surgery, which continues altered the minds/culture of Orthopedic environments.

The Ruth Jackson Orthopedic Society, created in 1983, is an organization dedicated to uplifting women in Orthopedic Surgery. Ruth Jackson, a physician who experienced discrimination through her medical training and career, often working without pay, became the first female accepted into the American Academy of Orthopedic Surgery (AAOS).<sup>37–39</sup> A key focus of Ruth Jackson Orthopaedic Society (RJOS) is mentorship of a medical student, residents, and midcareer attendings. Mentorship includes mock interviews, grant writing tips, CV and cover letter templates, mock and exams for the American Board of Orthopaedic Surgeons (ABOS) examination.<sup>37</sup> RJOS also provides scholarships and traveling fellowships.<sup>37</sup>

Black Women Orthopaedic Surgeons (BWOS) and American Association of Latino Orthopaedic Surgeons (AALOS) are additional organizations that have blossomed within the last several years. The Perry Initiative and Nth Dimensions are pioneering pipeline programs for premedical and medical students that provide exposure and mentorship for students passionate about Orthopedic Surgery. The presence of these organizations is imperative to provide a voice for groups within Orthopedic Surgery that are small in number.

As we move into the leadership pathways, the ODLC has carved out a critical space for resources

and support of diversity, equity, and inclusion leaders across the United States and internationally. Through formal courses, strategy sessions, networking events, and monthly “Transformation Talks,” Diversity, Equity, and Inclusion (DEI) leaders, most of whom are also practicing surgeons, come together to share best practices, understand organizational dynamics, and learn strategic frameworks on how to create effective, sustainable change across all dimensions of diversity in a multitude of environments. This organization has been very effective for faculty and learners who serve in diversity-focused leadership roles that are intrinsically challenging yet gratifying. Many mentor-mentee leadership relationships have been established through the power of this network.

### **SUMMARY**

Mentorship and sponsorship are two vital components to professional and personal success and have become a mainstay in many academic and clinical environments. Without a doubt, there are still several barriers prohibiting inclusive mentorship from being widely understood and employed. There is much opportunity in our surgical fields to bridge gaps, subtle and macro in size, and bring respect, belonging, and empathy to our environments. The disparities begin earlier than is recognized and occur through multiple parts of one’s journey.

Fortunately, there are solution-based approaches that can be taken to mitigate these obstacles and form healthy, inclusive mentoring relationships. We can engage with the pioneering organizations that have leaned into the complex work of diversity, equity, and inclusion for additional support, insight, and resources. Our mentees deserve the best guidance and advocacy we can provide, which will significantly benefit the patients and communities we are gratefully obligated to serve.

### **CLINICS CARE POINTS**

#### **Pearls**

- Surgeons from a lower socioeconomic status benefit from more guidance through mentorship—often unaware of whom or when to ask for assistance and struggling significantly on the premedical track.<sup>28</sup>

- Students from disadvantaged backgrounds had a 50% decreased chance of entering the surgical field. They are more likely to have lower National Board of Medical Examiners (NBME) shelf scores, USMLE scores, and Alpha Omega Alpha status.<sup>15,23</sup>
- Female surgical trainees experience more frequent, severe and stressful microaggressions.<sup>30</sup>
- There are several mentorship organizations focusing on inclusive mentorship of medical student, residents, and midcareer attendings through one or one relationships, formal courses, strategy sessions, and networking events.<sup>36,37</sup>

Pitfalls

- Documented barriers to effective mentorship include mismatched expectations between mentor and mentee, lack of available mentors, lack of time/compensation for mentors, and geographic separation between mentor and mentee.<sup>40</sup>
- Many physicians in the workplace do not feel their institution supports mentorship in the workplace.<sup>40</sup>
- Without institutional support, the workplace environment does not demand inclusion and responsibility of promoting this environment falls on individuals, not the workplace.<sup>40</sup>

DISCLOSURE

Consultant for Johnson & Johnson DePuy Synthes. Founder of the Orthopedic Diversity Leadership Consortium. Sponsored by Stryker, Total Joint Orthopedics, Tru-Color, and Johnson & Johnson DePuy Synthes.

REFERENCES

- Schrock JB, Kraeutler MJ, Dayton MR, et al. A comparison of matched and unmatched orthopaedic surgery residency applicants from 2006 to 2014: data from the national resident matching program. *J Bone Joint Surg Am* 2017;99(1):e1.
- Day CS, Lage DE, Ahn CS. Diversity based on race, ethnicity, and sex between academic orthopaedic surgery and other specialties: a comparative study. *J Bone Joint Surg Am* 2010;92(13):2328–35.
- Poon S, Kiridly D, Mutawakkil M, et al. Current trends in sex, race, and ethnic diversity in orthopaedic surgery residency. *J Am Acad Orthop Surg* 2019; 27(16):e725–33.
- Poon SC, Nellans K, Gorroochurn P, et al. Race, but not gender, is associated with admissions into orthopaedic residency programs. *Clin Orthop Relat Res* 2020;480(8):1441–9.
- McDonald TC, Drake LC, Replogle WH, et al. Barriers to increasing diversity in orthopaedics: the residency program perspective. *JB JS Open Access* 2020;5(2).
- Chambers CC, Ihnow SB, Monroe EJ, et al. Women in orthopaedic surgery: population trends in trainees and practicing surgeons. *J Bone Joint Surg Am* 2018;100(17):e116.
- Van Heest A. Gender diversity in orthopedic surgery: we all know it's lacking, but why? *Iowa Orthop J* 2020;40(1):1–4.
- Acuna AJ, Sato EH, Jella TK, et al. How long will it take to reach gender parity in orthopaedic surgery in the united states? An analysis of the national provider identifier Registry. *Clin Orthop Relat Res* 2021; 479(6):1179–89.
- Dykes DC, White AA 3rd. Getting to equal: strategies to understand and eliminate general and orthopaedic health care disparities. *Clin Orthop Relat Res* 2009;467(10):2598–605.
- Betancourt JR, Carrillo JE, Green AR. Hypertension in multicultural and minority populations: linking communication to compliance. *Curr Hypertens Rep* 1999;1(6):482–8.
- Saha S, Freeman M, Toure J, et al. Racial and ethnic disparities in the VA health care system: a systematic review. *J Gen Intern Med* 2008;23(5):654–71.
- Sedlis SP, Fisher VJ, Tice D, et al. Racial differences in performance of invasive cardiac procedures in a Department of Veterans Affairs Medical Center. *J Clin Epidemiol* 1997;50(8):899–901.
- Hannan EL, van Ryn M, Burke J, et al. Access to coronary artery bypass surgery by race/ethnicity and gender among patients who are appropriate for surgery. *Med Care* 1999;37(1):68–77.
- Hoening H, Rubenstein L, Kahn K. Rehabilitation after hip fracture—equal opportunity for all? *Arch Phys Med Rehabil* 1996;77(1):58–63.
- The Match NRMP. Main Residency Match Data and Reports, Available at: <https://www.nrmp.org/match-data-analytics/residency-data-reports/>.
- Eguia E, Kolachina S, Miller E, et al. Medical students from socioeconomically disadvantaged backgrounds are less likely to match into surgery. *World J Surg* 2022;46(6):1261–7.
- Steel N, Clark A, Lang IA, et al. Racial disparities in receipt of hip and knee joint replacements are not explained by need: the Health and Retirement Study 1998–2004. *J Gerontol A Biol Sci Med Sci* 2008; 63(6):629–34.
- Schairer WW, Nwachukwu BU, Warren RF, et al. Operative fixation for clavicle fractures—socioeconomic differences persist despite overall population increases in utilization. *J Orthop Trauma* 2017;31(6):e167–72.

19. Zelle BA, Morton-Gonzaba NA, Adcock CF, et al. Health care disparities among orthopedic trauma patients in the USA: socio-demographic factors influence the management of calcaneus fractures. *J Orthop Surg Res* 2019;14(1):359.
20. Saha S, Komaromy M, Koepsell TD, et al. Patient-physician racial concordance and the perceived quality and use of health care. *Arch Intern Med* 1999;159(9):997–1004.
21. Shen MJ, Peterson EB, Costas-Muniz R, et al. The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities* 2018;5(1):117–40.
22. Menendez ME, van Hoorn BT, Mackert M, et al. Patients with limited health literacy ask fewer questions during office visits with hand surgeons. *Clin Orthop Relat Res* 2017;475(5):1291–7.
23. Raborn LN, Janis JE. Current views on the new united states medical licensing examination step 1 pass/fail format: a review of the literature. *J Surg Res* 2022;274:31–45.
24. Williams M, Kim EJ, Pappas K, et al. The impact of United States Medical Licensing Exam (USMLE) step 1 cutoff scores on recruitment of underrepresented minorities in medicine: a retrospective cross-sectional study. *Health Sci Rep* 2020;3(2):e2161.
25. Low D, Pollack SW, Liao ZC, et al. Racial/ethnic disparities in clinical grading in medical school. *Teach Learn Med* 2019;31(5):487–96.
26. Fogel HA, Finkler ES, Wu K, et al. The economic burden of orthopedic surgery residency interviews on applicants. *Iowa Orthop J* 2016;36:26–30.
27. Sungar WG, Angerhofer C, McCormick T, et al. Implementation of holistic review into emergency medicine residency application screening to improve recruitment of underrepresented in medicine applicants. *AEM Educ Train* 2021;5(Suppl 1):S10–8.
28. Ulloa JG, Viramontes O, Ryan G, et al. Perceptual and structural facilitators and barriers to becoming a surgeon: a qualitative study of african american and latino surgeons. *Acad Med* 2018;93(9):1326–34.
29. Aryee JNA, Bolarinwa SA, Montgomery SR Jr, et al. Race, gender, and residency: a survey of trainee experience. *J Natl Med Assoc* 2021;113(2):199–207.
30. Barnes KL, McGuire L, Dunivan G, et al. Gender bias experiences of female surgical trainees. *J Surg Educ* 2019;76(6):e1–14.
31. Dib AG, Lowenstein NA, LaPorte DM, et al. The pioneering women of orthopaedic surgery: a historical review. *J Bone Joint Surg Am* 2022.
32. Bi AS, Fisher ND, Bleitnitsky N, et al. Representation of women in academic orthopaedic leadership: where are we now? *Clin Orthop Relat Res* 2022;480(1):45–56.
33. Campbell KM, Tumin D, Infante Linares JL. The need for better studies of impostor syndrome in underrepresented minority faculty. *Acad Med* 2021;96(5):617.
34. Gottlieb M, Chung A, Battaglioli N, et al. Impostor syndrome among physicians and physicians in training: A scoping review. *Med Educ* 2020;54(2):116–24.
35. Butler PD, Swift M, Kothari S, et al. Integrating cultural competency and humility training into clinical clerkships: surgery as a model. *J Surg Educ* 2011;68(3):222–30.
36. Brooks JT, Taylor E, Peterson D, et al. The J. Robert gladden orthopaedic society: past, present, and future. *J Am Acad Orthop Surg* 2022;30(8):344–9.
37. Samora JB, Russo C, LaPorte D. Ruth jackson orthopaedic society: promoting women in orthopaedics. *J Am Acad Orthop Surg* 2022;30(8):364–8.
38. Cannada LK, O'Connor MI. Equity360: gender, race, and ethnicity-harassment in orthopaedics and #SpeakUpOrtho. *Clin Orthop Relat Res* 2021;479(8):1674–6.
39. Whicker E, Williams C, Kirchner G, et al. What proportion of women orthopaedic surgeons report having been sexually harassed during residency training? A survey study. *Clin Orthop Relat Res* 2020;478(11):2598–606.
40. Bonifacino E, Ufomata EO, Farkas AH, et al. Mentorship of underrepresented physicians and trainees in academic medicine: a systematic review. *J Gen Intern Med* 2021;36(4):1023–34.