Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

The American Journal of Surgery 220 (2020) 1536–1538

Contents lists available at ScienceDirect

The American Journal of Surgery

journal homepage: www.americanjournalofsurgery.com

My Thoughts/My Surgical Practice

Mentorship strategies to foster inclusivity in surgery during a virtual era

Since the emergence of SARS-COV-2, the virus has percolated insidiously through communities. For several months, it has dismantled social infrastructure globally and transitioned us to an era of relative isolation. This introduces a paradox. In the setting of social distancing, previously established relationships are strengthened. Especially in hospitals, healthcare teams have come together and deepened their interdependence in an effort to address the surge of COVID-19.

However, those without existing social networks are at risk of becoming isolated in medical workplaces. For those vulnerable groups, this will certainly have repercussions on academic achievement and career development. For example, medical students who have only recently chosen a career in surgery. Normally, they would have spent this spring identifying mentors through sub-internships, research projects, or other activities. While some, well-connected students may have access to the networks required to advance, many without such advantages will not. Social isolation is a well-known obstacle for students from underrepresented ethnic and gender groups in academic medicine, even without the recent effects of social distancing. These social capital inequities are certain to impede academic and professional success for those without solid networks for guidance and support.

There have been previous attempts to level the playing field for those who enter medicine without established mentors. On the topic of minority physicians in academic medicine alone, over 300 articles have been published in the last two decades with no improvements in diversifying the physician workforce.[1] The lack of representation and the importance of effective mentorship has been demonstrated, yet effective solutions remain to be implemented. But the question now is, how do we close those gaps when they are amplified by social distance? How can the goals of successful mentorship be achieved and maintained during social distancing? This article examines strategies for broadening access to mentorship opportunities to promote inclusivity in a virtual age.

Why address mentorship during a virtual era?

Addressing mentorship in medical school is necessary to promote a diverse and inclusive environment especially now as the ongoing Coronavirus pandemic will require prolonged social isolation. Before the current pandemic, a myriad of studies had demonstrated disproportionately low numbers of minority students in medical teams,[2] while others had revealed that mentorship has a profound impact on those who are first-generation and underrepresented in medicine (URiM.) It has also been corroborated in other studies that minority students have experienced reduced mentorship opportunities due to the smaller number of URiM physicians at academic centers.[3] The shortage in mentorship is multifactorial, as there is a disconnect between URiM and the majority due to background, financial status, culture, and the pressure of underrepresented students to represent their entire demographic.[3] This is further compounded by the intangible knowledge transfer that occurs outside of formal medical curricula which has been termed the "hidden curriculum," or the nuances of socialization processes.[4] The Association of American Medical Colleges (AAMC) has encouraged medical schools to bring these processes into view, and for students to have mentors that can help them navigate and prepare for challenging issues that may not be a component of formal teaching.[4] This has been echoed in studies that have called for the establishment of mentorship programs to promote a more inclusive physician body, particularly for academic surgery.[2]

Due to the aforementioned disconnect, guidance from faculty mentors means the difference between whether or not URiM and first-generation students apply for grants, fellowships, and research opportunities that have been known to compensate for some disadvantages.[5] In surgery specifically, one study demonstrated that a mentored surgical specialty clerkship for URiM students provided research opportunities that led to a successful match.[6] If such strategies were implemented by surgical leadership at every medical school, there would be a universal pipeline to usher in diverse talent. In fact, the academic chair of surgery is often viewed as one of the most influential leaders in academic health systems.[1] Hence, although it is the responsibility of the students to seek opportunities, it is the responsibility of surgery leadership to take a proactive approach in promoting an inclusive workforce, starting with mentoring URiM and first-generation students. This is the key to successfully implementing strategies to provide equitable access that have been long overdue.

We propose the following two action items to improve mentorship overall, specifically for those who may need it most. (see Table 1)

Intentional outreach

Promoting inclusivity within virtual communities starts with a liaison. Especially when contact is virtual, leaders must intentionally establish a structure to close the gaps between the social capital haves and the have-nots to ensure equitable access to mentors. We propose appointing an attending or resident in the surgery department as the liaison between faculty and both URiM and first-

https://doi.org/10.1016/j.amjsurg.2020.07.006
0002-9610/Published by Elsevier Inc.

Table 1
Key operational strategies and solutions to establish mentoring relationships for at-risk students that will promote inclusivity during social isolation.

Barrier	Solution
M4 students lack mentors and career development opportunities as a result of social distance, leading to crisis before the residency applications are due	- Surgery clerkship director will send a survey to M4 class to identify students most in need of mentors and project opportunities - M4 students will be matched to a mentor and a corresponding project group - Mentors will meet with students to review application material, promote momentum of student goals, and facilitate mock interviews - Project groups will meet weekly to establish accountability that will ensure completion of tasks
URiM and first-Generation students lack networks and mentors upon matriculation	- Appoint a resident or faculty liaison in the surgery department - Liaison will have a list of available mentors and projects that welcome student involvement for each subspecialty - Liaison will connect to diversity and inclusion offices and executive boards of URM and first-generation student organizations to raise awareness of the surgery mentorship program
Students lacking technology for communication	- Identify students and provide a borrowed laptop or alternative. This can be initiated by sending out a school-wide survey.

generation students. Liaisons will have two lists: one of faculty and residents in each surgery specialty who are interested in mentoring students, and a second of projects that welcome student contributions. In this manner a liaison will also be a resource for those who decide to switch specialties late. This is imperative because this strategy aids in leveling the playing field for students without existing connections.

We also recommend liaisons establish relationships with two entities: leaders of student organizations that serve those who are URiM and first-generation, and diversity and inclusion offices. Raising awareness of the mentorship program through these connections could occur through any medium: email, virtual meetings, or panels.

Mentoring students early on and connecting them to a network is necessary for recruiting a diverse group and promoting academic success. Some student organizations and Diversity, Equity, and Inclusion offices already have programs to facilitate the transition into medical school. Aiding in transition is especially true for surgery, as the discrepancy between student and surgeon expectations perpetuate misperceptions and negative stereotypes about the surgical profession.[7] This mismatch is one of many reasons why underrepresented students may also choose not to pursue a career in surgery. One study that piloted a one-day workshop outlining expectations and immersing students in an OR simulation successfully addressed misperceptions.[7] For surgical residency, the ACS Division of education has established effective longitudinal programs to prepare residents for surgical practice by setting milestones and providing sustainable mentors.[8]

From these examples, the answer to diversifying academic surgery is continuous professional development through a longitudinal, interactive, multitier network. To address URiM students' concerns and ensure ongoing academic success throughout medical school, we recommend a structured, multilevel mentoring relationship through surgery mentorship programs.

Structured virtual communities

We propose that each department of surgery establish specialty-specific virtual communities to ensure equal access to mentorship. These virtual communities would allow students to connect with surgeons in the field of their interest. To both develop these mentor-mentee relationships throughout medical school and maximize the guidance each M4 student receives in the coming months before ERAS is submitted, we recommend:

1. **Conduct a mentorship needs evaluation:** The liaison will conduct a proactive needs evaluation to identify M1-M3 students interested in surgery and M4 students applying for surgical residencies this fall. The survey should also elicit what specialties students are interested in and who currently lacks mentorship. It should also consist of the liaison's list of current projects and research teams that are seeking student input. Each student would rank these projects by preference and career interest.
2. **Match with mentors and project groups:** Based on the evaluation, liaisons will match students with project groups led by their resident and faculty mentors. M3 and M4 students will also be paired to M1s and M2s within each group to provide a safe space for junior students to ask questions.
3. **Research Project:** As project leads, mentors will organize weekly meetings to ensure the group's research initiatives advance. During meetings, senior and junior medical students will lead peer feedback on manuscripts and projects. Faculty will give the final input. Workshops involving technical skills and what makes an effective manuscript would also take place during these meetings to enrich skillset and quality of feedback.
4. **Mentorship Goal Setting:** During their first 1:1 videoconference meeting, mentors and mentees will establish goals and time frames leading to ERAS submission and residency interviews. For all students, faculty and resident mentors will challenge mentees to set higher goals for themselves. This involves directing them to opportunities such as grants, manuscript writing, and implementing initiatives with lasting influence.
   a. **M4s:** Topics to discuss during the first meeting include reviewing the student's CV and personal statement, organizing a list of programs they intend to apply to, and completion of projects before submitting ERAS. Mentors and project leads will set up mock interviews over videoconference to simulate virtual interviews as anticipated this fall.
   b. **M1-M3s:** Topics to discuss would revolve around building a CV, passing shelf exams, and skill-building strategies to succeed on the wards. These could include but are not limited to effective oral presentations and OR etiquette.

Closing remarks

Given the ongoing relative social isolation of the upcoming year, let us make sure we are creating virtual communities so that each

student has the necessary network and equipment to access their mentors (e.g., iPads or computers). It is also important not to assume that students have access to virtual platforms and electronic devices, and may require creative alternatives like borrowed computers or electronic medical school resources. Altogether, these strategies will foster inclusion by providing accessible mentors and successful mentoring relationships, especially during a new virtual age.

Declaration of competing interest

We have no conflicts of interest to disclose.

References

1. Butler PD. When excellence is still not enough. *Am J Surg*. 2020. https://doi.org/10.1016/j.amjsurg.2020.06.015.
2. Butler PD, Longaker MT, Britt LD. Addressing the paucity of underrepresented minorities in academic surgery: can the 'rooney rule' Be applied to academic surgery? *Am J Surg*. 2010;199(2):255–262. https://doi.org/10.1016/j.amjsurg.2009.05.021.
3. Roberts SE, Shea JA, Sellers M, Butler PD, Kelz RR. Pursuing a career in academic surgery among African American medical students. *Am J Surg*. 2019;219(4):598–603. https://doi.org/10.1016/j.amjsurg.2019.08.009.
4. Kalter L. Navigating the hidden curriculum in medical school. AAMC. Updated July 30 2019 www.aamc.org/news-insights/navigating-hidden-curriculum-medical-school. Accessed June 20, 2020.
5. Haeger H, Fresquez C. Mentoring for inclusion: the impact of mentoring on undergraduate researchers in the sciences. *CBE-Life Sci Educ*. 2016;15(3). https://doi.org/10.1187/cbe.16-01-0016.
6. Nellis JC, Eisele DW, Francis HW, Hillel AT, Lin SY. Impact of a mentored student clerkship on underrepresented minority diversity in otolaryngology-head and neck surgery. *Laryngoscope*. 2016;126(12):2684–2688. https://doi.org/10.1002/lary.25992.
7. McKinley SK, Kochis M, Cooper CM, Saillant N, Phitayakorn R. Medical students' perceptions and motivations prior to their surgery clerkship. *Am J Surg*. 2019;218(2):424–429. https://doi.org/10.1016/j.amjsurg.2019.01.010.
8. Sachdeva AK. Educational interventions aimed at the transition from surgical training to surgical practice. *Am J Surg*. 2019;217(3):406–409. https://doi.org/10.1016/j.amjsurg.2019.09.012.

Natalie Ailene Moreno*
University of Michigan Medical School, 2021, USA

Justin B. Dimick
Chair of the Department of Surgery, University of Michigan, USA

2101 Taubman Center, 1500 E. Medical Center Drive, Ann Arbor, MI 48109, USA

Erika A. Newman
Vice Chair for Faculty Development, Associate Chief Clinical Officer for Health Equity, C.S. Mott Children's Hospital, University of Michigan Medical School, USA

2101 Taubman Center, 1500 E. Medical Center Drive, Ann Arbor, MI 48109, USA

* Corresponding author.
E-mail address: (N.A. Moreno)

1 July 2020