Creating Sustainable Near-Peer Mentorship: A Review of the Anastomosis Program

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Background: Anastomosis is a longitudinal, family-style near peer mentorship program started within the department of surgery at the University of Michigan in 2020. Each group consists of 1–2 medical students, a PGY-1 surgery resident, an academic development time resident, and a faculty member. Groups meet quarterly for mentorship as well as to discuss important sociocultural issues such as microaggressions, work-life balance, and burnout.

Objectives: To assess the efficacy of Anastomosis – a novel near-peer surgical mentorship program – three years into the program.

Methods: Survey of multiple choice, Likert-style, and free response questions regarding participants' experiences in Anastomosis.

Participants: Current medical student, resident, and faculty members of Anastomosis

Results: Eighteen of the current 40 Anastomosis participants (45%) filled out our survey. In providing a safe space for mentorship, 89% of respondents found Anastomosis to be helpful (56% "very helpful", 22% "helpful", 11% "somewhat helpful"), while 11% found it to be "not helpful at all". In discussing sociocultural topics, 82% of respondents felt

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comfortable (65% "very comfortable", 18% "somewhat comfortable"), while 12% felt neither comfortable nor uncomfortable, and only 1 person felt "somewhat uncomfortable. All of the residents who responded to our survey reported they felt "very comfortable" discussing sociocultural topics.

In the subgroup analysis, people who found Anastomosis to be "very helpful" in providing a safe space for mentorship were more likely to spend time with their group members outside of Anastomosis, keep in contact via text, and feel comfortable discussing sociocultural issues than those who found it "not helpful at all."

Conclusion: Anastomosis has been successful in achieving its goals of providing trainees with a safe space for mentorship and to discuss important sociocultural topics that are often neglected in surgical training. Most members feel comfortable discussing these sensitive topics, possibly because of the strong ties that formed within their groups through mentorship and freeform discussion. Furthermore, some groups spontaneously collaborated on research, resulting in 50+ publications. The most pressing area for improvement was identified to be scheduling logistics, but overall Anastomosis is effective and can serve as a model for near-peer mentorship programs in surgery residency programs.

Keywords

mentorship • sociocultural issues • burnout • surgery residency

Introduction

It is well documented that general surgery residents face a number of issues such as stress, burnout, gender discrimination, mistreatment, and suicidal ideation.[1–11] Moreover, certain groups of residents face additional obstacles, with female residents often experiencing gender discrimination and sexual harassment,[2,12,13] and racial and ethnic minority residents struggling more with program fit and building relationships with colleagues.[14] Despite the evidence, few generalizable solutions or support structures have been put in place to combat these issues, as traditional mentorship within general surgery tends to focus more on career development rather than mental health and wellness.[15,16]

With this in mind, "Anastomosis," a near-peer family-style mentorship program for medical students, residents, and faculty in general surgery was started at the University of Michigan in 2020. Anastomosis was formed with the goal of improving resident camaraderie, increasing faculty engagement, and facilitating discussions of important sociocultural topics in a supportive, informal group of peers and near-peer colleagues. Groups of "Anastomosis families" were formed, each consisting of 1–2 medical students, a PGY-1 general surgery resident, a PGY-4 general surgery resident in their academic development time, and a general surgery attending. Groups are formed by the Anastomosis leadership team based on information provided by participants including preference for certain group members, a predictive compatibility questionnaire,[17] Myers Briggs personality type, race and gender (used to ensure groups were demographically diverse), similar hobbies and research interests, and subspecialty interest. The structure of Anastomosis is a 2-year program where groups meet every 3–4 months, with each meeting having a different focus such as microaggressions, advocacy, resilience, etc. During each 2-hour meeting, half of the time is devoted to general mentorship and the other half is devoted to discussing the meeting's specific sociocultural topic. For more detail on the creation of Anastomosis and selection process for Anastomosis families, please refer to "How We Do It:

An Innovative General Surgery Mentoring Program" by Shen *et al*. in the Journal of Surgery Education (PMID: 35581113).[18]

In the three years since Anastomosis has launched, two general surgery cohorts have completed the entire 2-year curriculum and the program is still in place, with new members joining each year. In fact, this model was expanded to all surgical subspecialties at the University of Michigan and adopted at other institutions. In this study, we specifically aimed to understand how effective Anastomosis has been in building camaraderie amongst residents, faculty, and students and how effective it has been in providing a safe space to discuss sensitive sociocultural topics by surveying its current members. Herein we present our findings from participant surveys on quality outcomes on satisfaction and community building 3 years after inception.

Methods

After performing a literature search regarding program evaluation of mentoring programs in medicine and surgery, we designed a survey to evaluate the Anastomosis program. The survey consisted of five multiple choice, 6 Likert-style, and 3 free response questions for a total of 14 items regarding the perception of the mentorship provided, the sociocultural discussions, as well as the strengths and areas of improvement of the program (Supplementary Appendix 1). Research productivity was assessed both based on survey response, as well as looking up each member of Anastomosis in PubMed and finding papers published by them that included at least one or more of their Anastomosis group-mates during the time they participated in Anastomosis. The survey was reviewed by study authors and evaluated for clarity and readability of items. Surveys were created on Qualtrics software, version XM (Qualtrics, Provo, UT), which allowed for electronic response to survey. IRB exemption was obtained (HUM00233612). Links to the survey were provided in emails sent to individuals with requests for voluntary participation in the survey distributed on 5/22/23 with responses accepted until 6/23/23. Our goal was at least a 30% response rate with respondents including medical students, residents, and faculty to allow for subgroup analysis. Given that Anastomosis includes participants at all of these levels of training, we wanted to determine if one particular group benefits from the program more than the others and, if so, why that might be. We also wanted to compare responses of those who found Anastomosis "very helpful" in creating a safe space for mentorship with those who found it "not helpful at all" to determine if there are major areas we can identify for improvement. No incentive was provided for participation.

The data was then reviewed. Due to the small sample size, statistical analysis was limited, however, descriptive statistics were calculated followed by subgroup analyses comparing responses by two variables: level of training and those who found Anastomosis to be "very helpful" in creating a safe space for mentorship versus those who found it "not helpful at all".

Results

All 40 current Anastomosis members, consisting of 9 faculty, 19 residents, and 12 medical students, were invited via email to complete a survey on their experience in Anastomosis. A total of 18 participants (45% response rate) filled out the survey, including 6 faculty (67% response rate), 8 residents (42% response rate), and 4 medical students (33% response rate). Of the 18 respondents, 33% were in Anastomosis since its inception in 2020, 17% joined in 2021, and 50% joined in 2022. We found that 67% of respondents reported that their group

met in addition to the standard quarterly Anastomosis meetings and 61% kept in contact regularly via group text.

In regards to mentorship, 89% of respondents found Anastomosis to be helpful to varying degrees in providing a safe space for mentorship, with 56% reporting it was "very helpful," 22% reporting it was "helpful," and 11% reporting it was "somewhat helpful." However, 11% of respondents reported that Anastomosis was "not helpful at all" in providing a safe space for mentorship. Among resident respondents, 75% reported Anastomosis to be "very helpful" in providing a safe space for mentorship, while the other 25% found it to be "helpful" (Figure 1).

In discussing sociocultural topics, 61% of respondents reported they were "very comfortable" with these discussions, 5% reported they were "comfortable," 18% reported they were "somewhat comfortable," 11% reported they were "neither comfortable nor uncomfortable," 5% reported they were "somewhat uncomfortable," and nobody reported feeling "very uncomfortable" (Figure 2). All 8 of the resident survey respondents reported feeling "very comfortable" discussing sociocultural topics.

The majority (56%) of respondents reported that less than 25% of meeting time was devoted to discussing the meeting-specific sociocultural topic, while the other 44% reported 25–50% was devoted to the sociocultural topic discussion. Freeform discussion and/or mentorship made up 75% or more of the meeting time for 53% of respondents, 50–75% of the time for 18% of respondents, and 25–50% of the meeting time for 29% of respondents.

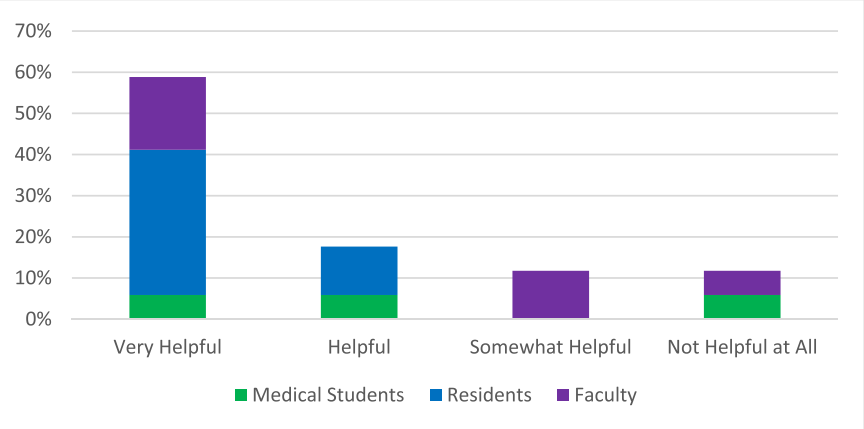

Figure 1. Efficacy of Anastomosis in Creating a Safe Space for Mentorship by Level of Training

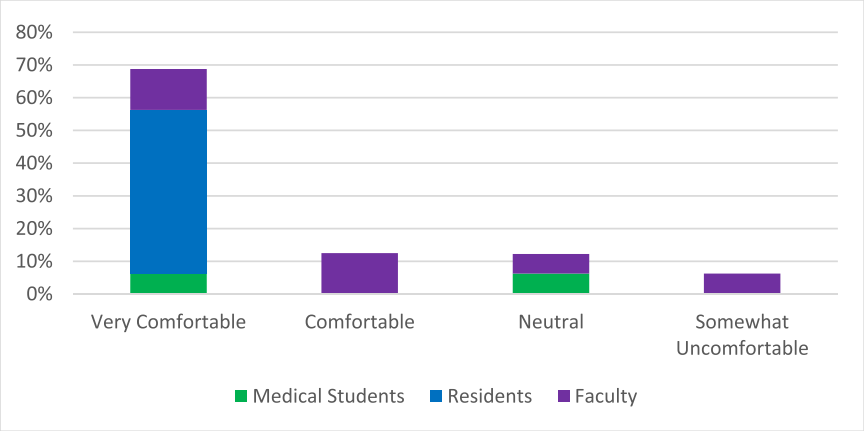

Figure 2. Level of Comfort Discussing Sociocultural Issues within Anastomosis Groups by Level of Training

Although research is not an explicit component of Anastomosis, a minority of participants (22%) reported they were able to work on research projects within their Anastomosis groups. This resulted in at least 11 publications and an average of 4 research projects per participant when they were able find research opportunities. When cross-referencing on PubMed for all current Anastomosis members (beyond just the participants who responded to our survey), over 50 publications were identified as coming from various Anastomosis groups. However, 1 person reported that they attempted to find research through Anastomosis but were unable to, and the other 71% of participants surveyed did not try to find research opportunities. Overall, residents had the most success in finding research, as all three of the residents who reported that they tried to find research opportunities were able to publish their work.

Finally, a subgroup analysis was conducted comparing responses of those who found Anastomosis to be "very helpful" in creating a safe space for mentorship (n = 10) and those who found it to be "not helpful at all" (n = 2). Participants in the "very helpful" group had much more contact with each other than those in the "not helpful at all group," with 80% of them indicating their groups regularly met outside of official meetings and 60% indicating that their groups kept in contact via text. By contrast, none of the participants in the "not helpful at all group" met outside of official meetings, nor did they keep in contact with their group via text. Notably, one of the participants in the "not helpful at all" group reported that they never met with their group and the other reported that they rarely met with their group. In terms of feeling comfortable discussing sociocultural issues in their groups, 90% of those in the "very helpful" group felt "very comfortable" doing so, whereas one of the respondents in the "not helpful at all group" felt "neither comfortable nor uncomfortable" and the other left the question blank as they had never met with their group. Lastly, in the free response section, people in the "very helpful" group were more likely to discuss how Anastomosis positively impacted them whereas those in the "not helpful at all" group were more likely to leave suggestions for improvement.

Discussion

When Anastomosis was first conceived, one of its goals was to provide surgical trainees with effective mentorship, as well as provide psychologically safe space to discuss important sociocultural topics that are often neglected in surgical training. In the three years since inception, these results largely demonstrate positive outcomes in these areas. The vast majority of respondents reported that Anastomosis was helpful in providing a safe space for mentorship (89%) and reported they felt comfortable discussing sociocultural topics within their groups (82%). The mentorship component of the program appears to be more impactful, with the majority of groups spending more time on mentorship than discussing sociocultural topics. Furthermore, the majority of free response answers on the positive impact of Anastomosis reference the mentorship component more than the sociocultural component. Anastomosis has also had some unanticipated benefits, such as participants engaging in and publishing research within their groups, as well as the strength of the camaraderie, with many groups remaining in contact beyond the prescribed two years.

Based on our findings, Anastomosis has been most successful in establishing strong mentorship ties within Anastomosis families. This is consistent with findings in other evaluations of near-peer vertical mentoring programs. In describing a similar general surgery mentorship program in Ottawa, Champion et al. reported high mentor and mentee satisfaction with structured, group mentorship.[19] Similarly, a vertical near-peer medical student mentorship program described by Andre et al. also resulted in effective mentorship with high member satisfaction.[20]

In addition to the data presented above, qualitative testimonials from our survey responses show that Anastomosis has positively impacted many of its members at all levels of training. One resident reported "[Anastomosis has positively impacted me] tremendously. I've become closer to my coresidents and have a mentor in my Anastomosis mentor. I've met med students that I love mentoring and I have a safe space to debrief and discuss the really, really hard aspects of residency." Another resident shared that "it helped me to gain perspective about my first year of residency. Having members from multiple levels of training that were willing to be vulnerable and share with each other was incredibly valuable." A faculty member commented that they are "encouraged and energized by the trainees' and students' enthusiasm and ambitions! It is heartening to meet these folks in person, particularly given that I joined faculty during COVID and don't have much contact with students or residents in my clinical practice" and a medical student shared that "[Anastomosis] has connected me to faculty, residents, and upperclassmen within surgery who have been a great source of advice, guidance, and friendship."

While mentorship seems to be emphasized by groups, the sociocultural component is ever-present and important. Gender discrimination and sexual harassment is well-reported in surgery, with 65.1% of female residents reporting gender discrimination and 19.9% reporting sexual harassment in a large study by Hu et al. that surveyed over 7400 surgery residents.[1] Another study by Yuce et al. that surveyed over 6900 surgery residents found that 23.7% experience discrimination based on race, ethnicity, or religion, with 70.7% of black residents, 45.9% of Asian residents, and 25.3% of Hispanic residents experiencing discrimination.[21] Furthermore, both studies reported clear associations of discrimination and abuse with burnout and suicidal ideation.[1,21] With rates of burnout in general surgery residency ranging from 38.5% to 77%,[1,21,22] and rates of suicidal ideation ranging from 3.8% to 6.5%,[1,21] understanding and addressing contributing factors is essential to improving resident mental health. Interestingly, most members of Anastomosis that we surveyed reported feeling comfortable discussing these sensitive and often neglected topics in this setting, possibly due to the camaraderie formed within their groups through mentorship and freeform discussion. Furthermore, spontaneous working relationships within the realm of research formed within some of the groups, resulting in over 50 publications. These results suggest that mentoring programs like Anastomosis have untapped potential for professional development in the form of research collaboration that should be explored going forward.

This study has a few important limitations, including the small sample size and component of selection bias. When surveying participants for this study, only 18 of the 40 current members of Anastomosis responded to the survey. Although only 18 participants responded, given that this makes up 45% of Anastomosis membership and that we had a distribution of medical students, residents, and faculty respond, we believe our data includes enough respondents and enough variety to reasonably identify patterns. While some current members have been in the program since the beginning, members who were part of Anastomosis in 2020 but who have since graduated or are no longer participants were not included due to the low feasibility of reaching them via email. Additionally, since response to this survey was optional and respondents were not randomly selected, there is likely a component of selection bias. Furthermore, it is possible that there is a component of voluntary response bias, wherein those with strong positive or negative opinions are more likely to self-select to respond to the survey.

In this study evaluating the effects of this novel mentoring program, results demonstrated that participants largely value the mentorship component and have, overall, had great experiences with it. These findings were especially present among the residents. The only respondents who reported that they did not benefit from participating in Anastomosis were those who were unable to meet with their groups due to scheduling conflicts. To address this, we are conducting a root cause

analysis of this barrier, as it seems to be the major detractor from the positive effect seen from this mentoring structure. Options being considered include having slightly larger groups so at least some members can attend each meeting, ensuring each team has a resident on their academic development time with more flexible time, and implementing attendance forms in order to identify groups with fewer meetings so we can intervene sooner. We also plan to expand Anastomosis to include fellows and junior faculty. We anticipate this will be helpful in creating larger groups to improve scheduling concerns, as well as providing a support system for new fellows and junior faculty who generally do not have a support structure in place yet. Additionally, this may benefit residents and medical students, as, being closer to their levels of training, fellows and junior faculty can provide more contemporary advice. Finally, given the success of those who have pursued research through Anastomosis, we are considering incorporating research more formally into Anastomosis. While we do not want research to become required or overshadow the mission of discussing sociocultural topics and building a support network through mentorship, we also want to provide support by connecting participants looking for research.

Overall, as Anastomosis continues to evolve, the program has had largely positive outcomes in creating a safe space to discuss sociocultural programs and providing meaningful mentorship. This program provides an effective model of near-peer mentorship for surgery departments. Future research is needed to examine the replicability of this program at other institutions, as well as the impact of this mentoring structure on trainee mental health, experienced discrimination for women and minority trainees, and overall culture in surgery.

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Supplementary Appendix 1: Survey Distributed to Anastomosis Members

1. What is your role?
    - Medical student
    - Resident
    - Attending
2. When did you join the Anastomosis program?
    - 2020
    - 2021
    - 2022
3. How often does your group meet outside of the regularly scheduled Anastomosis meetings?
    - Never
    - Once every few months
    - Once a month
    - Every 2–3 weeks
    - Weekly
4. How often does your group communicate via text group chat(s)?
    - Never
    - Once every few months
    - Once a month
    - Every 2–3 weeks
    - Weekly
5. How much time during your meetings is devoted to discussion of the meeting's specific sociocultural topic?
    - Less than 25%
    - 25–50%
    - 50–75%
    - More than 75%
6. How much time during your meetings is devoted to unstructured discussion or general mentorship?
    - Less than 25%
    - 25–50%
    - 50–75%
    - More than 75%
7. How comfortable do you feel discussing sensitive sociocultural issues within your Anastomosis group?
    - Very uncomfortable
    - Somewhat uncomfortable
    - Neither comfortable nor uncomfortable
    - Somewhat comfortable
    - Very comfortable
8. How helpful do you feel Anastomosis has been in providing a space for mentorship?
    - Not helpful at all
    - Somewhat helpful
    - Helpful
    - Very helpful

9. Have you been able to collaborate on research projects within your group or get connected to research opportunities through Anastomosis?
    - Yes
    - I have not tried to
    - I have tried to, but have been unable to
10. If you have been able to find research projects through Anastomosis, how many projects have you gotten involved in as a result?
    - 0
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6 or more
11. If you have been able to find research projects through Anastomosis, how many publications, abstracts, or posters have you started or completed as a result?
    - 0
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6 or more
12. (Optional) What are some ways Anastomosis could be improved?
13. (Optional) What are some features of Anastomosis that you feel work well?
14. (Optional) How has Anastomosis personally impacted you, if at all?