

Crafting the Future Doctor: Mentorship in the First Year of Medical School

Sarah Shidid, MD; Haram Abdelmajid, MD; Pakinam Mekki, MD; and Tamar Anne Smith-Norowitz, PhD

Background: The Clinically Reimagined Apprenticeship For Physician Training (CRAFT) program is a volunteer, student-run, clinical mentorship program that started in 2015 at an academic medical center in the Mid-Atlantic region. Clinical exposure during the first year of medical school may influence a student's decision to pursue internal medicine for their residency program of choice.

Methods: A retrospective chart analysis of CRAFT program volunteers was conducted. First-year medical school students at an academic medical center in the Mid-Atlantic region (first-year classes of 2020 to 2022) who participated in the CRAFT program (N=77) were followed from first year until their medical school graduation. Information regarding first year mentor's specialty and student's match list data were collected.

Results: Students (51%) who participated in CRAFT matched into the same specialty of medicine as their CRAFT program mentors ($P=0.765$, Chi Square Test). The top specialties represented included emergency medicine, internal medicine, obstetrics/gynecology, and surgery. Of students (23%) who chose mentors in internal medicine, 50% matched into internal medicine residency programs ($P<0.0001$, Chi Square Test).

Conclusion: Clinical mentorship programs during the first year of medical school may be important for choosing future residency programs, leading to successful career goals. Timely engagement with mentors can be crucial in influencing career choices in the field of internal medicine.

Keywords: Career; Education; Medicine; Mentorship; Training

Clinical mentors in medical school play an active part in the development of a physician's career,¹ which may continue into post-graduate training.² Mentors work by helping foster the development of a budding physician's education through coaching, empathy, and willingness to spread knowledge and skills. Medical students may have notions of future specialty preferences, but these preferences are still not cemented until the third or fourth year of medical school.³ Clinical mentorship programs during the first year of medical school can help lay the groundwork to

students' future career goals,⁴ but these early programs may be uncommon or underreported.

Outside of the mandatory clinical curriculum, supplementation with longitudinal as well as auxiliary clinical experiences can spark student interest, as well as influence the field they choose to pursue for their future residency program.⁵ The aim of this study was to determine the effect of in-person clinical mentorship during the first year of medical school and the impact on their future career trajectory for choosing their

Corresponding Author: Sarah Shidid, MD, SUNY Downstate Medical Ctr., Department of Pediatrics, Division of Infectious Diseases, 450 Clarkson Ave, Brooklyn, New York 11203, USA, Tel: (718) 270-1295, Fax: (718) 270-3289, Email: sarah.shidid@gmail.com

Received: March 1, 2024
Revised: August 12, 2024
Accepted: August 19, 2024

doi:10.3121/cmr.2024.1911

Disclosures: The authors have no financial support or conflicts of interest related to this work to disclose. The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

respective residency programs, such as Internal Medicine (IM).

Methods

Organizational Context

The Clinically Reimagined Apprenticeship For Physician Training (CRAFT) program is a volunteer, student-run, clinical mentorship program that started in 2015 at an academic medical center in the Mid-Atlantic region. The aim of this program was to serve as a career advancement tool to connect first year medical students with clinical mentors to foster medical exposure and career development in specific clinical fields. The program ran throughout the summer after the conclusion of the first year of medical school, and the mentorship continued throughout the duration of medical school. Mentors for CRAFT were volunteer physicians who were recruited through email inquiries sent to them throughout the year asking if they would like to mentor a first-year medical student during their summer break. Interested medical student participants completed a questionnaire while in their first year of medical school regarding specialties in medicine that they were interested in exploring. Based on the lack of clinical experience students obtain early on in medical school, interests were often influenced by the subjects taught in the preclinical curriculum to which students wanted to gain exposure. Concurrently, interested faculty members were recruited and paired up with a medical student who was interested in further exploring their specialty. Students and mentors were paired according to the students' preferences for specialties and subject interests as indicated in the survey, provided these aligned with the mentors' areas of expertise. Throughout the summer, students would explore the specialty in the clinical setting and receive one-on-one advising from their mentor.

Chart Analysis

A retrospective chart analysis of CRAFT program volunteers was conducted. First-year medical school students (N=77) from the first-year classes of 2020-2022 who participated in the CRAFT program were followed from first year until their medical school graduation. These students were selected out of a total of ~600 medical students (~13% participation in CRAFT) enrolled during these class years based on their

willingness to come to campus (during the summer when classes were not in session). The day-to-day format consisted of students visiting their mentor's clinic, where they would shadow, obtain history and physical examinations, and document the clinical encounter. Students then supplemented their clinical work with practice objective structured clinical examinations to further their clinical knowledge, as well as private sessions with their mentor to discuss the application process and readiness for residency. Information regarding first year mentor's specialty and student's match list data were collected. The specialty of medicine that each student matched into for residency was compared with the specialty of medicine that the students were exposed to during the CRAFT program. Exclusion criteria consisted of students who did not match into residency and those who took gap years during medical school, where match data were unavailable.

Results

Participation of Medical Students in the CRAFT Program and Residency Outcomes

Across the three class years, students (51%) who participated in CRAFT matched into the same specialty of medicine as their CRAFT program mentors (Table I, $P=0.765$, Chi Square Test). Of students who chose mentors in internal medicine (IM; 23%), 50% matched into IM residency programs ($P<0.0001$, Chi Square Test) (Table 1). We initially used Fisher's exact test, which indicated statistical significance for those matched to IM and mentored by IM, despite the equal number of matched and unmatched cases. However, Fisher's exact test can be unreliable when applied to small sample sizes. When we conducted a binary regression analysis, the P value was 0.9538, indicating no significant association.

Table 2 illustrates the breakdown of mentor specialties and the number of students who had a mentor in each of the specialties. Of students who did not pursue the same specialty as their mentors, 49% chose fields such as anesthesia, IM, ophthalmology, psychiatry, and dermatology, among others. There was no obvious correlation that predicted what alternate specialty they would choose. For example, the one student who had a mentor in physical medicine & rehabilitation chose to pursue psychiatry for residency. Specialties not included in

Table 1. Participation of medical students in the CRAFT program and residency outcomes

Freshman Class Year	Chose Same Specialty as Mentor / Total No. of Participants (%)	Chose IM for Residency / Chose IM as Mentor (%)
2020	13/29 (45%)	5/10 (50%)
2021	15/27 (56%)	3/4 (75%)
2022	11/21 (52%)	1/4 (25%)
Total: N=77	39/77 (51%) $P=0.765^*$	9/18 (50%) $P<0.0001^{**}$ / 0.9538

*Chi Square Test, #: P value statistically significant ($P<0.05$) when using Fischer's exact test but not statistically significant when using binary regression analysis. Distribution of students separated by class years.

Table 2: Match rates of medical students by mentor specialty

Mentor Specialty	# Students	# Matched in Same Specialty	% Match	P value
Dermatology	1	0	0	1.0000
Emergency	29	12	41.37931034	0.9508
ENT	3	2	66.66666667	0.9471
Family Medicine	1	1	100	0.9300
Internal Medicine	18	9	50	0.9505
Neurology	1	0	0	1.0000
OB/GYN	6	2	33.33333333	0.9505
Orthopedics	2	2	100	0.9192
Pathology	1	1	100	0.9300
Pediatrics	2	1	50	0.9505
PM&R	1	0	0	1.0000
Psychiatry	3	2	66.66666667	0.9471
Radiology	1	0	0	1.0000
Surgery	6	1	16.66666667	0.9452
Urology	2	0	0	1.0000

There was no statistical significance between the groups of other subspecialties and their mentors' subspecialties (binary regression analysis, N=77, $P>0.05$).
Abbreviations: ENT; otolaryngology [ear, nose, throat]; OB/GYN, obstetrics/gynecology; PM&R, physical medicine & rehabilitation

the data, as no students had mentors in those subspecialties, included ophthalmology, radiation oncology, and anesthesia.

Discussion

The aim of the CRAFT Program is to shift medical education, using the participation of faculty mentors as the primary method to acquire clinical knowledge. The program was born out of a need to obtain early clinical exposure, as it was recognized that medical students early in their training do not have many connections to attending physicians. Students were paired with a physician in the specialty of their choice and worked one-on-one with attendings during their shifts twice a week. Additionally, there was a Friday session in which one student chose a case they had seen first-hand, and the rest of the team works together to diagnose and treat the patient. The true spirit of CRAFT came from the professional, educational, and supportive advantages through mentorship.

The central finding of this pilot study demonstrated that clinical mentorship exposure during the first year of medical school may influence a student's decision to pursue IM for their residency program of choice. Mentorship is an active, ongoing process that should begin early and continue evolving during different phases of medical training.⁶ Early clinical exposure (that allows students to form longitudinal

relationships with mentors) might be helpful when choosing resident specialty. This may be due to personal support from the mentor and the development of a strong student-faculty relationship. However, to our knowledge, prior literature has not reported similar timely first-year mentorship programs in other medical school settings.

Mentorship in healthcare carries many benefits that influence development and future career choices, but it requires coaching and education.⁷ For example, in radiation oncology, mentorship played an important role in specialty selection and research productivity with many mentees presenting at national conferences.⁸ There is no current standard as to what constitutes good mentorship, but what is known is that lack of it can be detrimental. Absent structures of mentorship and delayed engagement opens the window for many opportunities to be implemented, but it requires institutional efforts to enforce.⁹ Nonetheless, the availability, quality,

and standardization of mentorship creates notable disparities, which adds to the challenge of matching in competitive specialties such as orthopedic surgery.¹⁰ This is further compounded by the fact that mentors and mentees perceive different barriers to forming fruitful mentorships and are additional obstacles to overcome.¹¹ To address these barriers, open discussions should be had between mentors and mentees that outline expectations and what each party is hoping to gain from the relationship. This could be further addressed by mentors having increased involvement in the medical school curriculum, allowing longitudinal relationship and opportunities for both sides to share their perspectives.¹² While the definition of what constitutes mentorship is an ongoing work in progress, the need for it is pivotal for both mentors and mentees, as they both benefit from the relationship.¹³

The current study has several limitations. The sample size for students participating in certain subspecialties was small. Explanations for student's diverging from their mentor's specialty remain unclear, and it is possible that subsequent experiences in medical school had a greater influence on their specialty choices. Further research is required to gain a deeper understanding of the factors influencing their decision-making process regarding specialty selection. Moreover, there was no

criteria for what constituted as mentorship. Thus, mentorship experiences were not standardized and the varying experiences were never documented. This could be a confounding variable that might explain discrepancies between mentor specialty and the specialty the medical student chose to pursue for residency. Additionally, students were not followed throughout their medical school tenure. It is also unclear if experiences in their third or fourth year of medical school, where clinical exposure is heaviest, could have played a more substantial role in influencing career choices for some students more than others. More data are needed after conclusion of the formal mentorship program (ie, was there continuation of a relationship with the mentor).

This is an observational study; thus, there was no knowledge of the presumed specialty choice of the students. Lack of baseline specialty interest data might have affected the true impact/efficacy of the program. Similarly, students were paired with general internists, so there are no subspecialty data to report at this time.

Conclusions

Clinical mentorship programs during the first year of medical school may be important for choosing future residency programs in IM. Engagement with mentors early in medical school can influence career choices. Future studies are warranted to follow up on past participants once they have completed their residency to measure overall job contentment and the impact of early clinical exposure in medical school in guiding their career choice. Early mentorship programs are needed and would be helpful across specialties; other medical schools should consider copying this program.

References

1. Henry-Noel N, Bishop M, Gwede CK, Petkova E, Szumacher E. Mentorship in Medicine and Other Health Professions. *J Cancer Educ.* 2019;34(4):629-637. doi:10.1007/s13187-018-1360-6.
2. Dimitriadis K, von der Borch P, Störmann S, et al. Characteristics of mentoring relationships formed by medical students and faculty. *Med Educ Online.* 2012;17(1):17242. doi:10.3402/meo.v17i0.17242.
3. Vo A, McLean L, McInnes MDF. Medical specialty preferences in early medical school training in Canada. *Int J Med Educ.* 2017;8:400-406. doi:10.5116/ijme.59f4.3c15.
4. Bhatnagar V, Diaz S, Bucur PA. The Need for More Mentorship in Medical School. *Cureus.* 2020;12(5):e7984. doi:10.7759/cureus.7984.
5. Ladha FA, Pettinato AM, Perrin AE. Medical student residency preferences and motivational factors: a longitudinal, single-institution perspective. *BMC Med Educ.* 2022;22(1):187. doi:10.1186/s12909-022-03244-7.

6. Hill SEM, Ward WL, Seay A, Buzenski J. The Nature and Evolution of the Mentoring Relationship in Academic Health Centers. *J Clin Psychol Med Settings.* 2022;29(3):557-569. doi:10.1007/s10880-022-09893-6.
7. Burgess A, van Diggele C, Mellis C. Mentorship in the health professions: a review. *Clin Teach.* 2018;15(3):197-202. doi:10.1111/tct.12756.
8. Hirsch AE, Agarwal A, Rand AE, et al. Medical student mentorship in radiation oncology at a single academic institution: A 10-year analysis. *Pract Radiat Oncol.* 2015;5(3):e163-e168. doi:10.1016/j.pro.2014.08.005.
9. Carter A, Findlay MC, Earl ER, et al. Systematic Review of Research, Mentorship, and Career Resources for Medical Students Pursuing Neurosurgical Training. *World Neurosurg.* 2023;179:28-36. doi:10.1016/j.wneu.2023.07.133.
10. Aiyer AA, Mody KS, Dib AG, et al. Medical Student Mentorship in Orthopaedic Surgery. *J Am Acad Orthop Surg.* 2021;29(16):681-690.
11. ElHawary H, Salimi A, Gorgy A, Fesdekjian L, Seal A, Gilardino MS. Medical Student Mentorship in Surgery: Lessons Learnt and Future Directions. *J Surg Educ.* 2022;79(1):129-138. doi:10.1016/j.jsurg.2021.07.013.
12. Janis JE, Barker JC. Medical Student Mentorship in Plastic Surgery: The Mentor's Perspective. *Plast Reconstr Surg.* 2016;138(5):925e-935e. doi:10.1097/PRS.0000000000002670.
13. Benè KL, Bergus G. When learners become teachers: a review of peer teaching in medical student education. *Fam Med.* 2014;46(10):783-787.

Author Affiliations

Sarah Shidid, MD*; Haram Abdelmajid, MD*; Pakinam Mekki, MD*; and Tamar Anne Smith-Norowitz, PhD*

*Department of Pediatrics, Division of Infectious Diseases, State University of NY Downstate Health Sciences University, Brooklyn, NY 11203 USA.

Author contributions

SS was responsible for data collection, organization, and writing the manuscript. TSN was responsible for supervision, writing manuscript and editing. PM was responsible for providing resources as well as manuscript revision. HA was responsible for data and statistical analysis.