UC San Diego
UC San Diego Previously Published Works

Title
Virtual Subinternships in the COVID Era: Lessons Learned from Three Institutional Experiences

Permalink
https://escholarship.org/uc/item/1656m2qk

Journal
Plastic & Reconstructive Surgery Global Open, 11(3)

ISSN
2169-7574

Authors
Reghunathan, Meera
Dekker, Paige K
Belza, Caitlyn C
et al.

Publication Date
2023

DOI
10.1097/gox.0000000000004935

Peer reviewed

Virtual Subinternships in the COVID Era: Lessons Learned from Three Institutional Experiences

Meera Reghunathan, MD*
Paige K. Dekker, BA†
Caitlyn C. Belza, BS*
Kevin G. Kim, BS†
Brett T. Phillips, MD‡
Kenneth L. Fan, MD†
David A. Brown, MD, PhD‡
Amanda A. Gosman, MD*
Samuel H. Lance, MD*

Summary: After the cessation of all in-person visiting rotations during the coronavirus 2019 pandemic, many programs developed virtual rotations as an alternative for the recruitment and education of prospective applicants. In this study, we developed a consortium of three institutions each with a unique virtual subinternship and prospectively surveyed participating students in order to reflect and improve upon future rotations. All students participating in virtual subinternships at three institutions were administered the same pre subinternship and post subinternship electronic surveys. Subinternship curricula were developed independently at each respective institution. Fifty-two students completed both surveys, for an overall response rate of 77.6%. Students' primary objectives were to evaluate their fit with the program (94.2%), interact with residents (94.2%), gain faculty mentorship (88.5%), and improve didactic knowledge (82.7%). Postrotation surveys revealed that over 73% of students reported having met all of these objectives over the course of the rotation. On average, students ranked programs 5% higher overall after the rotation ($P = 0.024$). Postrotation results showed that the majority (71.2%) of students perceived the virtual subinternship as slightly less valuable than in-person subinternships but that all students would participate in a virtual subinternship again. Student objectives can be successfully met using the virtual format for subinternships. The virtual format is also effective in enhancing the overall perception of a program and its residents. Although students still prefer in-person subinternships, our results suggest that virtual rotations are more accessible and very capable of meeting student goals. *(Plast Reconstr Surg Glob Open 2023; 11:e4935; doi: 10.1097/GOX.0000000000004935; Published online 24 March 2023.)*

INTRODUCTION

In 2020, the Coalition for Physician Accountability, in coordination with the Association of American Medical Colleges, recommended halting all in-person away rotations and interviews.[1] Before the pandemic, nearly 95% of plastic surgery applicants participated in multiple visiting subinternships.[2] In-person experiences serve as an educational bridge between medical student and intern. They allow students to signal their interest in specific programs and evaluate one's "fit" for given programs.[2,3] An applicant's performance on away rotations is one of the most important factors considered by a program director in developing a rank list.[2,4] On average, 67% of integrated plastic surgery interns went to medical school or participated in an away rotation at the institution where they matched.[3]

In response to the recommendations released by the Coalition for Physician Accountability, some institutions developed virtual alternatives for the recruitment and education of prospective applicants.[5] This study aimed to analyze the efficacy and outcomes of plastic and reconstructive surgery virtual rotations via a consortium of three institutions, with independently developed virtual subinternship curricula.

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

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

METHODS

All students participating in virtual subinternships at three institutions during summer and fall 2020 were provided with two anonymous online surveys via Qualtrics (Provo, Utah): one survey was sent before the rotation started, and one was sent after completion. (**See appendix, Supplemental Digital Content 1**, which displays the prerotation survey questions. **http://links.lww.com/PRSGO/C505**.) (**See appendix, Supplemental Digital Content 2,** which displays the postrotation survey questions. **http://links.lww.com/PRSGO/C506**.) Student objectives were considered met if they ranked 4 or 5 on a Likert scale of 1 (objective not met) to 5 (objective definitely met).

Virtual curricula from each institution included participation in department conferences, at least one student presentation to the department, subscribing to the American Society of Plastic Surgeons Education Network, and social engagement with residents and faculty. Other components including rotation duration (4 weeks part-time at institution A; 2 weeks full-time at institutions B and C), number of activity hours per week, number of students per rotation iteration, suture laboratory sessions, and one-on-one faculty and/or resident mentorship differed amongst the institutions (Table 1).

Analysis included paired t test and McNemar test for continuous and dichotomous variables, Fisher exact tests for categorical variables, one-way ANOVA to examine differences across, symmetry testing to examine differences before versus after completion of a given rotation, and logistic regression to determine predictors for successful achievement of objectives. Statistical analysis was performed using STATA, v.15 (StataCorp, College Station, Tex.) with significance defined as P less than 0.05.

SURVEY RESULTS

Sixty-seven students participated in one of the virtual subinternships. Fifty-two students completed both surveys, yielding a response rate of 77.6%. Students learned about virtual subinternship opportunities most commonly via Instagram (38.5%) and word of mouth (23.1%). Students reported participating in an average of 2.8 virtual subinternships (SD 1.21) and spending an average of 22.3 hours (SD 12.9) preparing for and participating in subinternship activities weekly.

STUDENT OBJECTIVES

Prerotation, students reported their top objectives in virtual subinternships were to (1) evaluate fit with a given program (94.2%), (2) interact with residents (94.2%), (3) gain mentorship with faculty (88.5%), and (4) improve didactic knowledge of plastic surgery (82.7%). Postrotation, over 73% of respondents endorsed meeting these four primary objectives. Logistic regression

Takeaways

Question: Did virtual subinternships meet the objectives of prospective plastic and reconstructive surgery applicants?

Findings: Students' primary objectives included program fit, interaction with residents, faculty mentorship, and improved didactic knowledge. Most participants reported that these objectives were met on their virtual rotations. Although students felt virtual rotations were slightly less valuable than in-person rotations, all students would participate in a virtual subinternship again.

Meaning: Although students prefer in-person subinternships, virtual rotations are more accessible and capable of meeting student goals.

revealed that students completing a virtual subinternship with institutions A and C were significantly more likely to indicate that they had met the goal of gaining mentorship with faculty (OR 30, P = 0.004; OR 72, P < 0.001 respectively). The odds of successfully meeting the faculty mentorship goal were 51 times higher when students participated in a rotation that offered one-on-one mentoring (P < 0.001, 95% CI 8.26–314.92). Length of rotation was not a predictor of meeting any of the objectives (Table 1).

STUDENT PERCEPTIONS OF INSTITUTION

At the close of a virtual subinternship, rotators were significantly more likely to consider a program's residents to be a strength of the program (P = 0.011) and significantly less likely to consider a program's research opportunities (P = 0.0253) or geographic location (P = 0.0455) to be weaknesses of the program. Students' percentile ranking of programs significantly increased throughout the virtual rotation, with postrotation rankings being an average of 4.7 points higher than prerotation rankings (P = 0.0236) (Table 2).

PERCEIVED VALUE OF VIRTUAL SUBINTERNSHIP

Prerotation survey results show that all respondents thought the virtual subinternship would be much less valuable (17.3%), slightly less valuable (63.5%), or equally as valuable (19.2%) as an in-person rotation. All respondents reported that they would participate in a virtual subinternship again, but most respondents (87.8%) would not participate in a virtual subinternship in lieu of an in-person rotation (Table 3).

VIRTUAL SUBINTERNSHIPS: DO THEY WORK?

This study suggests that virtual subinternships are a novel and effective way to achieve most students' goals in

Table 1. Course Components and Objectives by Institution

Course Components	Institution A		Institution B		Institution C	
Length	4 wk		2 wk		2 wk	
No. students (total)	16		21		30	
No. respondents (total)	11		16		25	
Scheduled activity (h/wk)	4–6		16		25	
Maximum no. students/rotation	4		4		3	
One-on-one mentoring	Yes		No		Yes	
Case presentations	Yes		Yes		Yes	
Student presentation	Yes		Yes		Yes	
Participation in didactics	Yes		Yes		Yes	
Social engagement with residents	Yes		Yes		Yes	
Suture laboratory	Yes		No		Yes	
Student Objectives	% Selecting Objective	% Achieving Objective	% Selecting Objective	% Achieving Objective	% Selecting Objective	% Achieving Objective
Gain mentorship with faculty	82	91	81	25	96	96
Gain research opportunities	0	27	44	25	60	72
Interact with residents	100	91	88	75	96	92
Experience day-to-day schedule	18	27	81	50	80	48
Gain procedural/suturing skills	9	36	31	13	56	56
Improve didactic knowledge	55	91	100	94	84	100
Evaluate fit with program	91	91	94	82	96	96

Table 2. Student Perceptions of Programs

	Prerotation		Postrotation		
Student Perceptions of Program	**n**	**%**	**n**	**%**	**P**
Strengths					
Residents	15	28.8%	27	51.9%	**0.0105**
Faculty	23	44.2%	29	55.8%	0.1573
Program size	2	3.8%	3	5.8%	0.6547
Research opportunities	15	28.8%	8	15.4%	0.1967
Global health opportunities	15	28.8%	3	5.8%	**0.0013**
Geographic location	14	26.9%	5	9.6%	**0.0126**
Weaknesses					
Residents	3	5.8%	1	1.9%	0.1573
Faculty	1	1.9%	0	0.0%	0.3173
Program size	28	53.8%	21	40.4%	0.0522
Research opportunities	7	13.5%	2	3.8%	**0.0253**
Global health opportunities	19	36.5%	20	38.5%	0.8084
Geographic location	9	17.3%	5	9.6%	**0.0455**

P values in bold indicate a significant difference between pre- and postrotation scores.

subinternships. Participation in virtual subinternships can increase the positive perception of residents within a program and decrease the negative perception of program components like research opportunities and geographic location of the participating programs. Offering 1:1 virtual mentorship is key in achieving subinternship goals and should be incorporated into curricula going forward. Additionally, virtual interactive skills labs may address shortcomings related to formal assessment of student's clinical and surgical skills, although this will be evaluated further in future iterations to definitively demonstrate efficacy.

THE FUTURE OF VIRTUAL SUBINTERNSHIPS

Virtual surgical subinternships, while not replacing in-person rotations, provide a bridge for students who are unable to participate in physical rotations, creating equity amongst students. Continued coronavirus restrictions and the financial limitations of in-person subinternships will likely progress the demand for virtual opportunities. These institutions' experiences suggest that virtual subinternships, may decrease travel costs, enhance equity amongst applicants with respect to access to programs outside their home institution, offer more didactic and mentorship opportunities, and ultimately achieve the goals of most subinterns. Therefore, we believe that programs should continue to offer virtual learning opportunities, even with a return to in-person subinternships.

In future iterations of this study, incorporating pre- and postassessments, collecting additional data delineating the variation in rotation content across institutions, and exploring match outcomes would be beneficial additions. Finally, adopting a more precise term that identifies these educational forums as uniquely different from in-person subinternships is a task well suited for educational leadership.

3

Table 3. Perceived Value of Virtual Subinternship

	Perceived Value of Virtual Subinternship				
	Prerotation		Postrotation		
	n	%	n	%	*P*
Perceived value of virtual subinternship relative to in-person subinternship					0.1091
Much less valuable	9	17.3%	3	5.8%	
Slightly less valuable	33	63.5%	37	71.2%	
Equally as valuable	10	19.2%	9	17.3%	
Slightly more valuable	0	0.0%	2	3.8%	
Much more valuable	0	0.0%	1	1.9%	
Would you participate in a virtual subinternship again?					—
Yes	—		52	100.0%	
No			0	0.0%	
Would you participate in a virtual subinternship in lieu of an in-person subinternship?					—
Yes	—		5	12.2%	
No			36	87.8%	

Samuel Lance, MD
University of California, San Diego Medical Center
200 W. Arbor Drive
San Diego, CA 92103-8890
E-mail: shlance@health.ucsd.edu

DISCLOSURE

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

REFERENCES

1. Coalition for Physician Accountability. Coalition for Physician Accountability Releases recommendations on r021-22 residency season interviewing. NRMP. December 6, 2021. Available at https://www.nrmp.org/about/news/2021/08/coalition-for-physician-accountability-releases-recommendations-on-2021-22-residency-season-interviewing/. Accessed March 9, 2022.
2. Drolet BC, Brower JP, Lifchez SD, et al. Away rotations and matching in integrated plastic surgery residency: applicant and program director perspectives. *Plast Reconstr Surg.* 2016;137:1337–1343.
3. Molina Burbano F, Pasick C, Torina PJ, et al. Away rotations in plastic and reconstructive surgery: a survey of program directors. *Plast Reconstr Surg.* 2020;145:235e–236e.
4. Janis JE, Hatef DA. Resident selection protocols in plastic surgery: a national survey of plastic surgery program directors. *Plast Reconstr Surg.* 2008;122:1929–1939.
5. The Coalition for Physician Accountability's Work Group on Medical Students in the Class of 2021 Moving Across Institutions for Post Graduate Training. Updated Recommendations on Away Rotations for Medical Education Institutions of LCME-Accredited, U.S. Osteopathic, and Non-U.S. Medical School Applicants Work Group on Medical Students Moving Across Institutions for Post Graduate Training. December 6, 2022. Available at https://www.aamc.org/media/52326/download. Retrieved March 9, 2022.