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In-person, Hybrid, and Virtual Grand Rounds in Plastic Surgery: Impact and Participant Perceptions

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Background: Many plastic surgery residency programs adapted to the COVID-19 pandemic by implementing virtual grand rounds. This study aimed to assess the impact of virtual grand rounds and how attendees perceived virtual grand rounds to inform future programmatic planning.

Methods: This was a quality improvement initiative involving a cross-sectional survey and retrospective review of administrative records for the 2017–2018 (in-person) and 2021–2022 (virtual) academic years for two academic plastic surgery training programs in Boston, MA. Respondents were residents, fellows, and faculty within the two multisite plastic surgery residency training programs.

Results: There were 39 respondents (51% faculty, 41% residents, and 8% fellows). There was no evidence of different preferences for the format of future grand rounds ($P = 0.08$), with most preferring hybrid, defined as in person for speakers and others who could attend. Most respondents indicated a more accessible learning environment (86.8%) and lack of in-person interaction (82.1%) as reasons for liking and not liking virtual grand rounds, respectively. Excluding outliers, attendance in 2021–2022 was on average 7.4% points greater than that in 2017–2018 ($P < 0.001$), or six to seven more individuals at each session. There were significantly more out-of-state speakers in 2021–2022 (84%) as compared to 2017–2018 (28%) ($P = 0.0008$).

Conclusions: Virtual grand rounds improved attendance and the geographic diversity of speakers. Attendees preferred a hybrid format for future grand rounds, citing advantages and disadvantages to both in-person and virtual formats. *(Plast Reconstr Surg Glob Open 2023; 11:e5103; doi: 10.1097/GOX.0000000000005103; Published online 11 July 2023.)*

INTRODUCTION

Grand rounds are an important aspect of surgical residency programs, as they facilitate the sharing of advances in research and practice, promote formation of professional identity, and enable collaboration and networking.[1]

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This quality improvement project was reviewed by the IRB at Mass General Brigham and determined to be exempt from IRB review per their policies (45 CFR 46).

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The COVID-19 pandemic forced surgical programs to reevaluate the traditional in-person grand rounds format to protect the safety of attendees. Several plastic surgery programs have reported on their adaptive strategies to the pandemic with the institution of virtual, video-based grand rounds formats.[2,3] Our institution similarly adopted a virtual grand rounds format in 2020 at the onset of the pandemic.

With improving pandemic conditions and the loosening of restrictions on in-person congregations, the question remains as to how best to implement grand rounds moving forward. A study in orthopedic surgery suggested that virtual grand rounds may not only be preferred by attendees but also confers additional advantages such as cost-savings and improvements in attendance as compared to in-person grand rounds.[4] Within plastic surgery, one study revealed widespread

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adoption of virtual lecture formats among surgeons internationally, with generally positive experiences among attendees.[5] However, less is known regarding resident and faculty perceptions regarding hybrid grand rounds formats that incorporate both virtual and in-person components. In addition, less is known regarding the specific reasons for grand rounds preference within plastic surgery programs.

This study aimed to assess the perceptions of plastic surgery trainees and attendings with regard to virtual, in-person, and hybrid grand rounds formats across multiple institutions within two plastic surgery residency programs sharing combined grand rounds. In addition, this study evaluates attendance and grand rounds speaker characteristics pre- and postimplementation of virtual grand rounds to better characterize the impact. These findings help better inform plastic surgery programs in their ongoing adaptation to the pandemic and grand rounds organization moving forward.

Takeaways

Question: After the COVID-19 pandemic, what was the impact of virtual grand rounds and how did participants perceive these changes?

Findings: Virtual grand rounds improved attendance and speaker diversity, although most faculty and trainees preferred a hybrid format moving forward.

Meaning: Hybrid grand rounds may best balance the educational advantages of in-person and virtual grand rounds formats, and program directors should consider adopting hybrid grand rounds in the future.

METHODS

Survey Design

An anonymous survey was designed by study authors to assess baseline characteristics of survey respondents [eg, role in residency program, hospital affiliation, and year(s) in training or practice], preferences for grand rounds format, and to elicit qualitative feedback about virtual grand rounds as part of a quality improvement project. This quality improvement project was reviewed by the IRB at Mass General Brigham and determined exempt from formal IRB review per their policies. The Revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) were used to guide reporting of this quality improvement initiative.[6]

Preferences were elicited for three grand rounds formats: virtual, hybrid, and in-person. At our institution, virtual grand rounds were conducted over Zoom (San Jose, Calif.) for 1 hour. Hybrid grand rounds were defined as "an in-person event for those who could attend and virtual for those who could not. Speakers would be expected to speak in person," and this information was displayed to respondents.

Respondents were asked to select which grand rounds format was most effective for several themes (eg, networking and collegiality, delivering content) using previously published grand rounds education themes.[4] A complete list of questions and the overall survey administered to respondents are shown in Supplemental Digital Content 1. (**See table, Supplemental Digital Content 1**, which displays survey questions, **http://links.lww.com/PRSGO/C644**.)

Survey Administration

The survey was administered over email in May 2022 using the plastic surgery residency listserv. The same listserv was used for weekly communications about plastic surgery grand rounds and contains contact information for affiliated faculty, fellows, and residents. Our grand rounds spans two different residency programs across multiple hospitals. Participants were reminded once over email and once verbally. A third email reminder was sent directly to respondents unrepresented in the sample (eg, junior residents). The survey and data were managed using Research Electronic Data Capture (Vanderbilt University),[7,8] housed at Mass General Brigham.

Data Analysis

Statistical analysis was performed in R version 4.1.0. Categorical variables from the survey were expressed as frequencies using percentages. Frequencies were compared across groups using χ^2 tests or Fisher exact tests for categorical variables. Attendance data were reviewed using administrative records over the 2021–2022 (virtual) and 2017–2018 (in-person) academic years. Attendance at each grand round was calculated as a percentage, and the attendance rates during each year were compared using the Student *t* test after removing the outliers (ie, greater than 1.5× interquartile range below Q1 or greater than 1.5× interquartile range above Q3). Individual attendance scores were calculated for each participant as a percentage of all grand rounds attended during the academic year. Attendance scores of individuals present in the program during both years were compared descriptively; statistical inference was not possible due to a lack of Gaussian approximation. The geographic origin of speakers was extrapolated from administrative records of grand rounds speaker lists for the same two respective academic years.

RESULTS

Respondent Characteristics

There were 39 respondents, yielding a response rate of 46% of the 85 invited attendees and 67% of those 58 who attended at least one grand rounds in the 2021–2022 year. Respondents were 51% attendings and/or faculty, 41% residents, and 8% fellows. Most attendings had more than 10 years but less than 30 years of experience (55%). Most residents were postgraduate year 6 in training (31.3%). Most respondents had experience speaking at grand rounds (66.7%) and had experienced grand rounds in person before the COVID-19 pandemic (76.9%) (Table 1).

Table 1. Characteristics of Survey Respondents (n = 39)

Characteristic	n (%)
Role	
Resident	16 (41.0)
Fellow	3 (7.7)
Attending/faculty	20 (51.3)
Year in residency training	
PGY1	2 (12.5)
PGY2	2 (12.5)
PGY3	3 (18.8)
PGY4	1 (6.3)
PGY5	3 (18.8)
PGY6	5 (31.3)
Years of attending/faculty experience	
Less than 10 years	8 (40.0)
More than 10 years, less than 30 years	11 (55.0)
More than 30 years	1 (5.0)
Experience as a grand rounds speaker	
Yes	26 (66.7)
No	13 (33.3)
Experienced in-person grand rounds pre-COVID-19	
Yes	30 (76.9)
No	9 (23.1)

Speaker Characteristics

In 2017–2018 (in person), there were 18 speakers. Of these, 13 speakers (72%) were in state or directly affiliated with our institution or partner hospital. Only five speakers in 2017–2018 (28%) were from out of state. In 2021–2022 (virtual), 16 of the 19 speakers were from out of state (84%), while only three speakers were in state or affiliated with our institution (16%). There was greater geographic diversity represented among speakers in 2021–2022, with invited speakers presenting from various cities in New York, Texas, and California, as well as states such as Maryland, Michigan, Washington, and Ohio (P = 0.0008) (Table 2).

Grand Rounds Attendance

A total of 33 grand rounds were held between September 2017 and mid-May 2018, during which 84 faculty, fellows, and residents were invited to each session; 31 grand rounds were held between September 2021 and mid-May 2022, to which 85 members were invited. The median attendance at each grand rounds (calculated as the percentage of invitees present) in 2017–2018 was 35.7% (Q3–Q1: 38.7%–32.1%, minimum: 10.7%, maximum: 42.9%). By comparison, the median attendance at grand rounds in 2021–2022 was 41.2% (Q3–Q1: 45.9%–36.5%, minimum: 25.9%, maximum: 56.5%). After the two outliers from 2017 to 2018 were excluded to achieve a more near-Gaussian distribution, attendance in 2021–2022 was on average 7.4% points greater than that in 2017–2018 ($P < 0.001$), which corresponds to six to seven more individuals at each grand rounds session (Fig. 1).

Table 2. Speaker Characteristics Pre- and Postvirtual Grand Rounds Implementation (n = 37)

Characteristic	2017–2018 (In-person)	2021–2022 (Virtual)	*P*
Total no. speakers	18	19	
Affiliated with institution or in-state	13 (72%)	3 (16%)	
Out of state	5 (28%)	16 (84%)	0.0008
Geographic locations	Michigan, Colorado, Pennsylvania, Texas	New York, Texas (multiple cities), Maryland, Michigan, California (multiple cities), Washington, Ohio	

The median individual attendance score (percentage of overall grand rounds attended, per person) was 12.5% in 2017–2018 (Q3–Q1: 17.5%–0%, minimum: 0%, maximum: 47%), as compared to 50% (Q3–Q1: 71.9%–12.5%, minimum: 0%, maximum: 93.8%) in 2021–2022. Of those present both in 2017–2018 and in 2021–2022 (n = 46), six individuals had lower attendance scores in 2021–2022, seven individuals attended zero grand rounds in both years, and 33 individuals increased their attendance in 2021–2022, including all but one trainee. (**See figure, Supplemental Digital Content 2**, which compares individual attendance rates in 2017–2018 versus 2021–2022 (n = 46). Individual attendance rates (percentage of overall grand rounds attended, per person) displayed on the y-axis. In-person (2017–2018) and virtual (2021–2022) grand rounds years displayed on the x-axis with tracking of each individual across academic years, **http://links.lww.com/PRSGO/C645**.) Among the 33 individuals who improved their attendance, the average increase was 36.3% of the total 31–33 grand rounds (standard deviation: 22.1%), which corresponds to approximately 12 more grand rounds (standard deviation: seven grand rounds).

Grand Rounds Format Preferences

When comparing residents/fellows versus attendings, there was no significant difference in future grand rounds preference (P = 0.077). Both groups chose hybrid as their most preferred format (57.9% of residents/fellows and 50.0% of attendings). When comparing participants who had experienced in-person rounds before the pandemic versus those who never experienced in-person rounds, there was a significant difference in future preference (P = 0.046). Of those who had never experienced in-person rounds, 88.9% chose hybrid, while 43.3% of those who had experienced in-person rounds chose hybrid. A higher proportion of those who had experienced in-person rounds chose to be completely virtual compared to those who had never experienced in-person rounds (33.3% versus 0.0%). When comparing those who had been a prior speaker at grand rounds and those who had not, there was no significant difference in their future preferences (P = 0.2219), with both choosing hybrid as their most preferred option (46.2% of speakers and 69.2% of nonspeakers) (Table 3).

Perceptions of Grand Rounds

Figure 2 illustrates respondent perceptions of the comparative effectiveness of in-person versus virtual grand rounds formats. Most respondents selected the hybrid grand rounds format as most effective for delivering

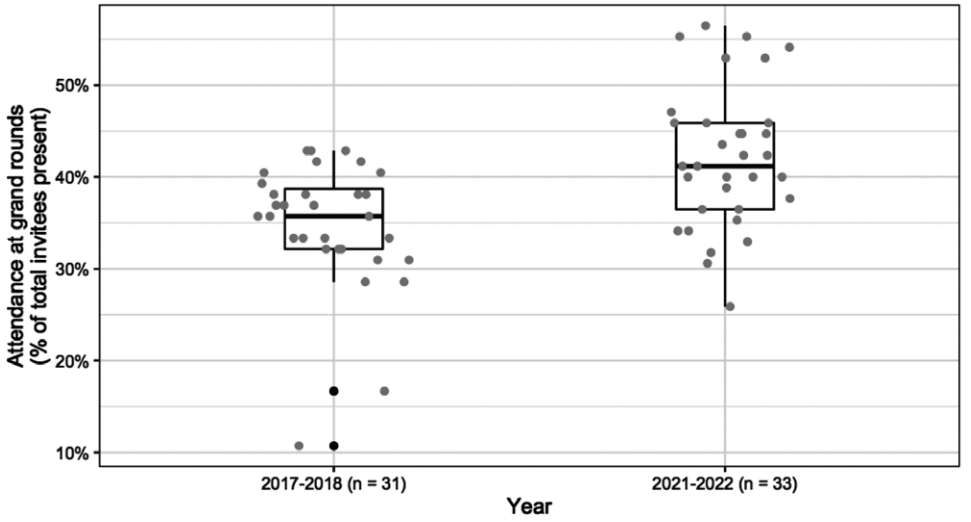

Fig. 1. Comparing grand rounds attendance between 2017–2018 and 2021–2022. Percentage of invited attendees present at each grand rounds is displayed on the y-axis. Individual grand rounds sessions for the 2017–2018 (in-person, n = 31) and 2021–2022 (virtual, n = 33) academic years displayed on the x-axis.

Table 3. Grand Rounds Format Preferences (n, %)

Format	Resident or Fellow	Attending	*P*
Virtual	2 (10.5)	8 (40)	0.07691
Hybrid	11 (57.9)	10 (50)	
In-person	6 (31.6)	2 (10)	
Total	19	20	
	Experienced In-person before	**Never Experienced In-person**	***P***
Virtual	10 (33.3)	0 (0)	0.04562
Hybrid	13 (43.3)	8 (88.9)	
In-person	7 (23.3)	1 (11.1)	
Total	30	9	
	Prior Speaker	**Never a Speaker**	***P***
Virtual	9 (34.6)	1 (7.7)	0.2219
Hybrid	12 (46.2)	9 (69.2)	
In-person	5 (19.2)	3 (23.1)	
Total	26	13	

content (38.5%), learning content (48.7%), and sharing and communicating new practice recommendations (51.3%) and research (59%). Most respondents selected the virtual format as most effective for ease/convenience of attending (51.3%), while most respondents selected the in-person format as most effective for networking and collegiality (82.1%), collaboration between presenters and attendees (61.5%), and remaining engaged/attentive (64.1%). Respondents who had experience speaking at grand rounds found the virtual format most effective for ease of presenting (61.5%), but the in-person format most effective for maintaining audience engagement and attention (65.4%).

Compared with the in-person format, respondents found that the virtual format increased diversity of speakers, enhanced convenience of accessing grand rounds from anywhere, and mitigated strain on time management and clinical responsibilities. Respondents most commonly cited lack of in-person interaction as a negative quality of virtual formats. **(See table, Supplemental Digital Content 3**, which displays the qualitative preferences of survey respondents (n = 39), **http://links.lww.com/PRSGO/C646**.)

DISCUSSION

As plastic surgery residency programs continue to adapt to changing pandemic guidelines, more information is needed regarding the impact of the pandemic on the learning environment and how best to implement grand rounds moving forward. Here, we illustrate how the implementation of virtual grand rounds within two multisite residency programs in a major city in the United States improved overall and individual attendance rates and enhanced speaker diversity. This article offers unique insights from program participants suggesting that, although virtual and in-person grand rounds both have advantages and disadvantages, a proposed hybrid format is most preferred by attendees.

In our program, attendance significantly improved with the implementation of virtual grand rounds. This improvement in attendance was observed both at the overall program level, with six to seven more individuals attending each session, and at the individual level, with the majority of attendees increasing their own personal attendance rate. We also observed that no single in-person grand rounds session had over 50% of invited program members present, and this also improved with virtual grand rounds. As such, attendance improved for a significant fraction of the program, comprising both faculty and trainees alike. Although reasons for this improvement are likely multifactorial, there was no program-wide change in attendance mandates or requirements. More likely, attendance improved due to the ease, convenience, accessibility,

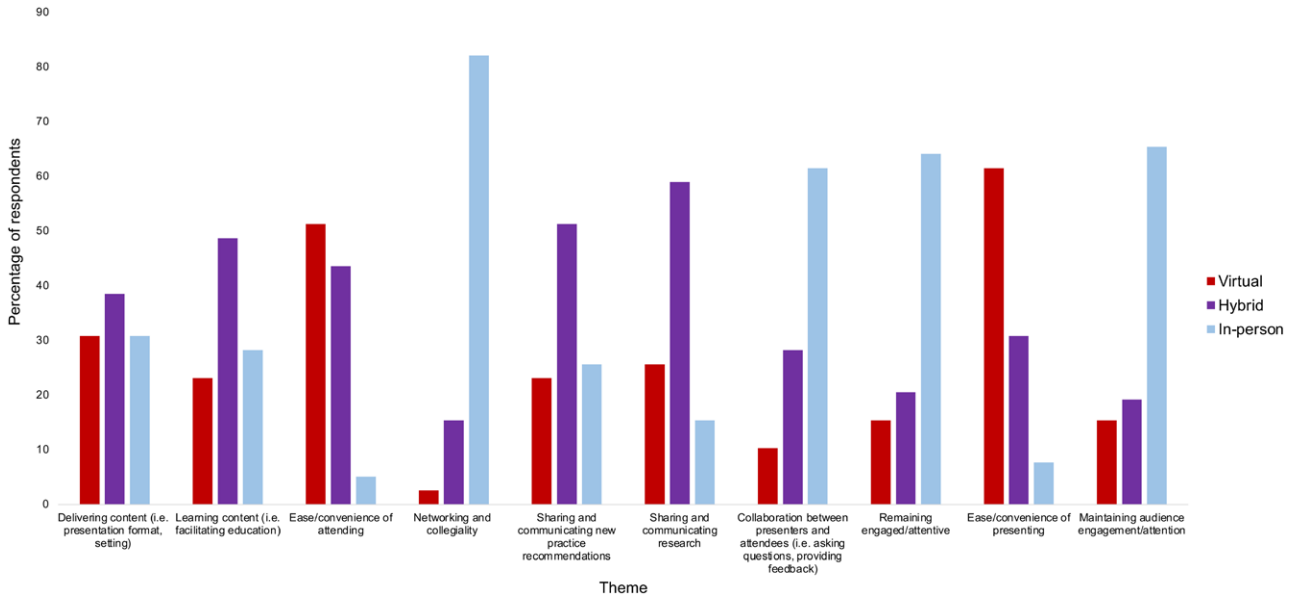

Fig. 2. Perceptions of grand rounds format on effectiveness (n = 39). Educational themes for grand rounds, as described by Reddy et al, displayed on the x-axis. Percentage of respondents who indicated the virtual, hybrid, or in-person format as most effective for achieving each respective educational theme is displayed on the y-axis.

and lack of impediments on clinical workflow as cited by attendees. However, attendees and speakers noted that virtual grand rounds may serve as a barrier to engagement. Although attendance is one objective marker for quality improvement, the benefits of improving attendance at the potential cost of active engagement for overall educational value remain to be determined. For example, many respondents reported difficulty paying attention and greater distractors with virtual formats in our study. Accountability may also be hampered by attendees turning off the video feature and multitasking during grand rounds. In addition, some attendees may have logged off of rounds prematurely after attendance was recorded. Reassuringly, however, virtual educational formats, while less preferred among attendees, have facilitated successful knowledge retention in other settings.[9,10]

We also observed a significant improvement in the geographic diversity of speakers with the implementation of virtual grand rounds. This was largely due to greater flexibility and convenience for speakers, who did not need to coordinate travel or contend with budgetary restrictions for travel compensation. As a result, we believe our trainees benefited from the greater diversity of speakers, consistent with the majority of attendees indicating that speaker diversity was a key advantage over in-person grand rounds. Although lack of networking and collegiality were cited as key disadvantages of virtual grand rounds, our trainee cohort had greater exposure to plastic surgeons and thought leaders within medicine outside our institution, which may serve as a valuable networking opportunity for some trainees. Additionally, given the greater diversity of speakers, there was also likely a greater breadth of topics presented at grand rounds, expanding learning opportunities for trainees and attendings alike. Not having a geographic limitation on inviting speakers also allows faculty to foster relationships with attendings at different institutions and can potentiate increased collaboration in research and clinical care. Moreover, the reduced cost of virtual speakers allows for those funds to be used elsewhere by the program.

Of note, when comparing those who had and had not previously experienced in-person grand rounds, a higher proportion of those who had experienced in-person rounds preferred the virtual format as compared to those who had never experienced in-person rounds (33.3% versus 0.0%). This suggests that virtual grand rounds may confer a benefit compared to in-person rounds that prior experience helped differentiate, which provides stronger support for the continuation of a virtual or a hybrid setting.

In line with these findings, the proposed hybrid format was preferred by most respondents at our program. The preference for hybrid grand rounds was consistent between residents, fellows, and attendings; those who had and had not previously experienced grand rounds; and those who had and had not spoken at ground rounds. Our study demonstrated various disadvantages and advantages to both virtual and in-person grand rounds, consistent with prior research in the orthopedic surgery setting.[4] As such, reasons for preferring hybrid grand rounds among attendees are likely due to a perceived bridging or compromise between the two formats. For example, hybrid grand rounds may confer the benefits of convenience and accessibility while also enabling greater networking and collegiality among attendees. Of note, the hybrid format was defined as in person for speakers and either virtual or in person for other attendees. As such, exploring other hybrid formats (virtual for speakers, alternating virtual and in-person grand rounds throughout the year, etc.) is likely warranted, especially since the hybrid format had

not been piloted or experienced by respondents at the time of this study.

There were limitations to our study. First, results were obtained as a quality initiative at our program, which may not be generalizable to other programs across the country. However, our program spans two residency training programs and multiple hospitals, which may better reflect heterogeneity in perceptions. Second, the response rate was limited, particularly among those invited to grand rounds but who did not attend grand rounds. As such, only the opinions of individuals who experienced grand rounds were demonstrated, and it may be helpful to understand the opinions of those who did not attend for ongoing quality improvement. Third, hybrid grand rounds, while most preferred, is a largely undefined and unstudied grand rounds format in current literature. More research is needed to understand the feasibility and educational value of hybrid grand rounds beyond participant preferences of this hypothetical format. Finally, assessing the impact of virtual or hybrid grand rounds on education was beyond the scope of this quality improvement initiative and will be an important topic of future study. Assessing the type of grand rounds format on retention, board scores, and clinical competence over time will be informative.

CONCLUSIONS

Residents, fellows, and faculty in our two plastic surgery training programs cite numerous advantages and disadvantages to both in-person and virtual grand rounds formats, with most attendees preferring a hybrid format for future grand rounds. Both speaker diversity and attendance improved significantly with the implementation of virtual grand rounds. Plastic surgery program directors should consider piloting and studying hybrid grand rounds in their ongoing adaptation to pandemic guidelines.

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DISCLOSURE

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

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