

Utilizing Telesimulation for Advanced Skills Training in Consultation and Handoff Communication: A Post-COVID-19 GME Bootcamp Experience

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COVID-19 forced the switch to virtual for many educational strategies, including simulation. Virtual formats have the potential to broaden access to simulation training, especially in resource-heavy “bootcamp”-type settings. We converted our in-person communication skills bootcamp to telesimulation and compared effectiveness and satisfaction between formats. During June 2020 orientation, 130 entering interns at one institution participated, using Zoom[®] to perform one mock consultation and three mock handoffs. Faculty rated performance with checklists and gave feedback. Post-bootcamp surveys assessed participant satisfaction and practice preparedness.

Telesimulation performance was comparable to in-person for consultations and slightly inferior for handoffs. Survey response rate was 100%. Compared to in-person, there was higher satisfaction with telesimulation, and interns felt more prepared for practice (95% vs 78%, $P < .01$); 99% recommended the experience. Fifty percent fewer faculty were required for implementation. Telesimulation was well-received and comparable to in-person bootcamp, representing a feasible, scalable training strategy for communication skills essential in hospital medicine. *Journal of Hospital Medicine* 2021;16:730-734. © 2021 Society of Hospital Medicine

Events requiring communication among and within teams are vulnerable points in patient care in hospital medicine, with communication failures representing important contributors to adverse events.^{1,4} Consultations and handoffs are exceptionally common inpatient practices, yet training in these practices is variable across educational and practice domains.^{5,6} Advanced inpatient communication-skills training requires an effective, feasible, and scalable format. Simulation-based bootcamps can effectively support clinical skills training, often in procedural domains, and have been increasingly utilized for communication skills.^{7,8} We previously described the development and implementation of an in-person bootcamp for training and feedback in consultation and handoff communication.^{5,8}

As hospitalist leaders grapple with how to systematically support and assess essential clinical skills, the COVID-19 pandemic has presented another impetus to rethink current processes. The rapid shift to virtual activities met immediate needs of the pandemic, but also inspired creativity in applying new methodologies to improve teaching strategies and im-

plementation long-term.^{9,10} One such strategy, telesimulation, offers a way to continue simulation-based training limited by the need for physical distancing.¹⁰ Furthermore, recent calls to study the efficacy of virtual bootcamp structures have acknowledged potential benefits, even outside of the pandemic.¹¹

The primary objective of this feasibility study was to convert our previously described consultation and handoff bootcamp to a telesimulation bootcamp (TBC), preserving rigorous performance evaluation and opportunities for skills-based feedback. We additionally compared evaluation between virtual and in-person formats to understand the utility of telesimulation for bootcamp-based clinical education moving forward.

METHODS

Setting and Participants

The TBC occurred in June 2020 during the University of Chicago institution-wide graduate medical education (GME) orientation; 130 interns entering 13 residency programs participated. The comparison group was 128 interns who underwent the traditional University of Chicago GME orientation “Advanced Communication Skills Bootcamp” (ACSBC) in 2019.^{5,8}

Program Description

To develop TBC, we adapted observed structured clinical experiences (OSCEs) created for ACSBC. Until 2020, ACSBC included three in-person OSCEs: (1) requesting a consultation; (2) conducting handoffs; and (3) acquiring informed consent. COVID-19 necessitated conversion of ACSBC to virtual in June 2020. For this, we selected the consultation and handoff OSCEs, as these

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skills require near-universal and immediate application in clinical practice. Additionally, they required only trained facilitators (TFs), whereas informed consent required standardized patients. Hospitalist and emergency medicine faculty were recruited as TFs; 7 of 12 TFs were hospitalists. Each OSCE had two parts: an asynchronous, mandatory training module and a clinical simulation. For TBC, we adapted the simulations, previously separate experiences, into a 20-minute combined handoff/consultation telesimulation using the Zoom® video platform. Interns were paired with one TF who served as both standardized consultant (for one mock case) and handoff receiver (for three mock cases, including the consultation case). TFs rated intern performance and provided feedback.

TBC occurred on June 17 and 18, 2020. Interns were emailed asynchronous modules on June 1, and mock cases and instructions on June 12. When TBC began, GME staff proctors oriented interns in the Zoom® platform. Proctors placed TFs into private breakout rooms into which interns rotated through 20-minute timeslots. Faculty received copies of all TBC materials for review (Appendix 1) and underwent Zoom®-based training 1 to 2 weeks prior.

We evaluated TBC using several methods: (1) consultation and handoff skills performance measured by two validated checklists^{5,8}; (2) survey of intern self-reported preparedness to practice consultations and handoffs; and (3) survey of intern satisfaction. Surveys were administered both immediately post bootcamp (Appendix 2) and 8 weeks into internship (Appendix 3). Skills performance checklists were a 12-item consultation checklist⁵ and 6-item handoff checklist.⁸ The handoff checklist was modified to remove activities impossible to assess virtually (ie, orienting sign-outs in a shared space) and to add a three-level rating scale of “outstanding,” “satisfactory,” and “needs improvement.” This was done based on feedback from ACSBC to allow more nuanced feedback for interns. A rating of “outstanding” was used to define successful completion of the item (Appendix 1). Interns rated preparedness and satisfaction on 5-point Likert-type items. All measures were compared to the 2019 in-person ACSBC cohort.

Data Analysis

Stata 16.1 (StataCorp LP) was used for analysis. We dichotomized preparedness and satisfaction scores, defining ratings of “4” or “5” as “prepared” or “satisfied.” As previously described,⁵ we created a composite score averaging both checklist scores for each intern. We normalized this score by rater to a z score (mean, 0; SD, 1) to account for rater differences. “Poor” and “outstanding” performances were defined as z scores below and above 1 SD, respectively. Fisher’s exact test was used to compare proportions, and Pearson correlation test to correlate z scores. The University of Chicago Institutional Review Board granted exemption.

RESULTS

All 130 entering interns participated in TBC. Internal medicine (IM) was the largest specialty (n = 37), followed by pediatrics (n = 22), emergency medicine (EM) (n = 16), and anesthesiol-

ogy (n = 12). The remaining 9 programs ranged from 2 to 10 interns per program. The 128 interns in ACSBC were similar, including 40 IM, 23 pediatrics, 14 EM, and 12 anesthesia interns, with 2 to 10 interns in remaining programs.

TBC skills performance evaluations were compared to ACSBC (Table 1). The TBC intern cohort’s consultation performance was the same or better than the ACSBC intern cohort’s. For handoffs, TBC interns completed significantly fewer checklist items compared to ACSBC. Performance in each exercise was moderately correlated ($r = 0.39$, $P < .05$). For z scores, 14 TBC interns (10.8%) had “outstanding” and 15 (11.6%) had “poor” performances, compared to ACSBC interns with 7 (5.5%) “outstanding” and 10 (7.81%) “poor” performances ($P = .15$).

All 130 interns (100%) completed the immediate post-TBC survey. Overall, TBC satisfaction was comparable to ACSBC, and significantly improved for satisfaction with performance (Table 2). Compared to ACSBC, TBC interns felt more prepared for simulation and handoff clinical practice. Nearly all interns would recommend TBC (99% vs 96% of ACSBC interns, $P = 0.28$), and 99% felt the software used for the simulation ran smoothly.

The 8-week post-TBC survey had a response rate of 88% (115/130); 69% of interns reported conducting more effective handoffs due to TBC, and 79% felt confident in handoff skills. Similarly, 73% felt more effective at calling consultations, and 75% reported retained knowledge of consultation frameworks taught during TBC. Additionally, 71% of interns reported that TBC helped identify areas for self-directed improvement. There were no significant differences in 8-week postsurvey ratings between ACSBC and TBC.

DISCUSSION

In converting the advanced communication skills bootcamp from an in-person to a virtual format, telesimulation was well-received by interns and rated similarly to in-person bootcamp in most respects. Nearly all interns agreed the experience was realistic, provided useful feedback, and prepared them for clinical practice. Although we shifted to virtual out of necessity, our results demonstrate a high-quality, streamlined bootcamp experience that was less labor-intensive for interns, staff, and faculty. Telesimulation may represent an effective strategy beyond the COVID-19 pandemic to increase ease of administration and scale the use of bootcamps in supporting advanced clinical skill training for hospital-based practice.

TBC interns felt better prepared for simulation and more satisfied with their performance than ACSBC interns, potentially due to the revised format. The mock cases were adapted and consolidated for TBC, such that the handoff and consultation simulations shared a common case, whereas previously they were separate. Thus, intern preparation for TBC required familiarity with fewer overall cases. Ultimately, TBC maintained the quality of training but required review of less information.

In comparing performance, TBC interns were rated as well or better during consultation simulation compared to ACSBC, but

TABLE 1. Comparison of Intern Communication Skills Performance on Consultation and Handoff Simulations From the 2019 Traditional In-Person ACSBC vs the 2020 Virtual TBC, University of Chicago Medicine

Communication skills performance measure, No. (%) completing item ^a	2019 ACSBC intern cohort (n = 128)	2020 TBC intern cohort (n = 130)	P value ^b
5Cs consultation checklist			
Contact			
States name	126 (98)	128 (99)	1.0
States rank and service	113 (88)	124 (96)	.04
Identifies supervising attending	28 (22)	81 (63)	<.01
Identifies name of consultant	122 (95)	117 (91)	.16
Communicate			
Presents a concise story	109 (85)	121 (94)	.05
Presents an accurate account of information and case detail	103 (80)	126 (98)	<.01
Speaks clearly	126 (98)	128 (99)	1.0
Core question			
Specifies reason for consultation	122 (95)	128 (99)	.17
Specifies timeframe for consultation	81 (63)	93 (72)	.18
Collaborate			
Is open to and incorporates consultant recommendations	123 (96)	123 (95)	.77
Close the loop			
Reviews and repeats plan of care	110 (86)	111 (86)	1.0
Thanks consultant	122 (95)	128 (99)	.17
Handoff checklist			
Appropriately prioritize patients (in order of ILLNESS) when delivering handoff?	53 (41)	33 (26)	<.01
Provide an appropriate amount of information in PATIENT summary	101 (79)	63 (49)	<.01
Communicate specific ACTION STEPS and inform receiver of what to do if situations arise	120 (94)	88 (68)	<.01
Inform receiver of what to do if possible situations arise (SITUATIONAL AWARENESS) (ie, "if _____, then _____")	N/A ^c	90 (70)	N/A
Encourage and provide receiver with opportunities to ask questions (SYNTHESIS)	106 (83)	78 (60)	<.01
Oriented handoff sheet in such a manner as to create shared space between self and receiver	64 (50)	N/A ^d	N/A

^aChecklist sources Martin et al⁵ and Gaffney et al.⁸

^bFisher's exact test analysis.

^cAdded in 2020 checklist.

^dUnable to assess in 2020 due to virtual format.

Abbreviations: ACSBC, Advanced Communication Skills Bootcamp; N/A, not available; TBC, Telesimulation Bootcamp.

handoffs were rated lower. This was likely due to the change in the handoff checklist from a dichotomous to a three-level rating scale. This change was made after receiving feedback from ACSBC TFs that a rating scale allowing for more nuance was needed to provide adequate feedback to interns. Although we defined handoff item completion for TBC interns as being rated "outstanding," if the top two rankings, "outstanding" and "satisfactory," are dichotomized to reflect completion, TBC handoff performance is equivalent or better than ACSBC. TF recruitment additionally differed between TBC and ACSBC cohorts. In ACSBC, resident physicians served as handoff TFs, whereas only faculty were recruited for TBC. Faculty were primarily clinically active hospitalists, whose expertise in handoffs may result in more stringent performance ratings, contributing to differences seen.

Hospitalist groups require clinicians to be immediately proficient in essential communication skills like consultation and

handoffs, potentially requiring just-in-time training and feedback for large cohorts.¹² Bootcamps can meet this need but require participation and time investment by many faculty members, staff, and administrators.^{5,8} Combining TBC into one virtual handoff/consultation simulation required recruitment and training of 50% fewer TFs and reduced administrative burden. ACSBC consultation simulations were high-fidelity but resource-heavy, requiring reliable two-way telephones with reliable connections and separate spaces for simulation and feedback.⁵ Conversely, TBC only required consultations to be "called" via audio-only Zoom[®] discussion, then both individuals turned on cameras for feedback. The slight decrease in perceived fidelity was certainly outweighed by ease of administration. TBC's more efficient and less labor-intensive format is an appealing strategy for hospitalist groups looking to train up clinicians, including those operating across multiple or geographically distant sites.

TABLE 2. Comparison of Satisfaction With Bootcamp Experience With Consultation and Handoff Simulations From the 2019 Traditional In-Person ACSBC vs the 2020 Virtual TBC, University of Chicago Medicine

Agreement with statement on post-bootcamp evaluation, No. (%) ^a	2019 ACSBC intern cohort (n = 128)	2020 TBC intern cohort (n = 130)	P value ^b
Simulation was realistic			
Consultation	127 (99)	123 (95)	.07
Handoff	115 (89)	120 (92)	.52
Satisfied with performance			
Consultation	104 (81)	125 (96)	<.01
Handoff	100 (78)	123 (95)	<.01
Satisfied with feedback			
Consultation	128 (100)	129 (99)	1.0
Handoff	127 (99)	129 (99)	1.0
Simulation useful to future practice			
Consultation	124 (97)	129 (99)	.21
Handoff	126 (98)	128 (99)	1.0
Feel prepared to perform activity in clinical practice			
Consultation	120 (94)	127 (98)	.14
Handoff	117 (91)	129 (99)	<.01
Online module prepared well for simulation			
Consultation	94 (73)	108 (83)	.07
Handoff	88 (69)	108 (83)	<.01

^a"Agreement" defined as "Agree" or "Strongly Agree" on 5-point scale.

^bFisher's exact test analysis.

Abbreviations: ACSBC, Advanced Communication Skills Bootcamp; TBC, Telesimulation Bootcamp.

Our study has limitations. It occurred with one group of learners at a single site with consistent consultation and handoff communication practices, which may not be the case elsewhere. Our comparison group was a separate cohort, and groups were not randomized; thus, differences seen may reflect inherent dissimilarities in these groups. Changes to the handoff checklist rating scale between 2019 and 2020 additionally may limit the direct comparison of handoff performance between cohorts. While overall fewer resources were required, TBC implementation did require time and institutional support, along with full virtual platform capability without user or time limitations. Our preparedness outcomes were self-reported without direct measurement of clinical performance, which is an area for future work.

We describe a feasible implementation of an adapted telesimulation communication bootcamp, with comparison to a previous in-person cohort's skills performance and satisfaction. While COVID-19 has made the future of in-person training activities uncertain, it also served as a catalyst for educational innovation that may be sustained beyond the pandemic. Although developed out of necessity, the telesimulation communication bootcamp was effective and well-received. Telesimulation represents an opportunity for hospital medicine groups to implement advanced communication skills training and assessment in a more efficient, flexible, and potentially preferable way, even after the pandemic ends.

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