



# Implementation of a skills-based virtual communication curriculum for medical students interested in surgery

Anna B. Newcomb<sup>1,9</sup> · Rachel D. Appelbaum<sup>2</sup> · Muneera Kapadia<sup>3</sup> · Ryan Dumas<sup>4</sup> · Jonathan Dort<sup>5</sup> · Eleanor Carey<sup>6</sup> · Mannet Dhaliwal<sup>7</sup> · Shira Rothberg<sup>5,10</sup> · Chang Liu<sup>5</sup> · Denise Mohess<sup>8</sup>

Received: 20 May 2022 / Revised: 16 August 2022 / Accepted: 28 September 2022  
© The Author(s), under exclusive licence to Association for Surgical Education 2022

## Abstract

**Background** Communication skills are essential to providing patient-centered care. The need for standardized communication skills training is at the forefront of medical school and residency education. We aimed to design and implement a curriculum teaching virtual communications skills to medical students. The purpose of this report is to describe our experience and to offer guidance for training programs developing similar curricula in the future.

**Methods** The curriculum was presented in weekly modules over 5 weeks using Zoom technology. We focused on proven strategies for interacting with patients and other providers, adapted to a virtual platform. Skill levels during role-play were assessed by the Simulated Participants and students observing the simulation using the 14-item, physician specific Communication Assessment Tool (CAT). The primary outcome of the CAT is the percentage of “excellent” for each item ranked both years. Participants provided feedback on what worked well or how the module could be improved in open-ended responses.

**Results** Twenty-eight and 25 students registered for the course in Year 1 and Year 2, respectively. Students’ post-session confidence in their ability to perform target skills was statistically higher than their pre-session scores in most sessions. Modules with the lowest pre-session confidence for both years were “Disclosing a Medical Error” and “Responding to Patient Bias.” The mean percentage of students receiving “excellent” scores on individual CAT items ranged from 5 to 73% over the course of both years. Verbal and written feedback in Year 1 provided direction for the curriculum developers to improve the course in Year 2.

**Conclusions** Developing and implementing a new education curriculum is a complex process. We describe an intensive curriculum for medical students as we strive to allow students extra “clinical” time during COVID-related restriction. We believe continued focus on patient and family communication skills will enhance patient care.

**Keywords** Medical education · Virtual platform · Interpersonal and communication skills · Curriculum implementation · Simulation

## Abbreviations

ACGME	Accreditation Council for Graduate Medical Education
CAT	Communication Assessment Tool
EAST	Eastern Association for the Surgery of Trauma
SP	Simulated participant
TA	Teaching assistant
TSN	Trauma Survivors Network
Y1/Y2	Year 1/year 2

## Introduction

Communication skills are essential to providing patient-centered care customized and adapted to patients’ individual values, needs, and preferences [1]. Clear and compassionate communication is critical in clinical practice where communication needs vary in complexity, from setting patient expectations and assessing adherence, to eliciting patient perspectives and concerns, to managing family conflicts and patient counseling [2]. Physician communication proficiency is related to important outcomes such as treatment compliance, accurate information exchange, patient experience, and even clinical outcomes [3–5].

Communication skill development is receiving increasing emphasis in medical school curricula [6], and approaches

✉ Anna B. Newcomb  
Anna.Newcomb@inova.org

Extended author information available on the last page of the article

to identifying and improving communication behavior have become well established in social science literature [7–12]. Medical school accreditation is contingent upon the inclusion of specific instruction in communication skills, and the American Board of Medical Specialties indicates that students must demonstrate competence in an ability to exchange information with patients and families [13–15]. Even so, students often hone their skills at the bedside through modeling of mentor residents and attendings, resulting in inconsistent training and subjective judgments [16–18]. Simulation and role play have advantages in medical education including sharpening skills before engaging with patients, providing video-recording for learner review and assessment, and receiving professionally mediated feedback following practice [19–21].

At the onset of the COVID-19 pandemic, requirements to minimize medical students' face-to-face contact created educational challenges; medical students were excluded from clinical exposure, leaving them eager for any patient-related communication experiences. Virtual education is a proven, powerful tool [22–24]; in one study of 804 medical students regarding their perceptions of "E-learning," the lack of patient interaction and technical problems were noted as the primary disadvantages; however the ability to increase knowledge was not identified as a problem [22]. Furthermore, since the pandemic precipitated an accelerated change in the physician–patient communication paradigm with the rapid adoption of video-based medical appointments, we aimed to design and implement a curriculum teaching virtual communications skills to medical students. The purpose of this report is to describe our experience and to offer guidance for training programs developing similar curricula in the future. The project was deemed exempt by the hospital institutional review board.

## Materials and methods

We considered resources available to develop our curriculum as either specific to our institution or available to all. The Inova Fairfax Medical Campus is a Level I trauma center and a tertiary care referral center with an academic affiliation with the University of Virginia School of Medicine. Inova's 30 surgical residents participate in quarterly communication training modules; the faculty and staff designing and implementing this pilot course for second year medical students were drawn from the Surgical Residency Communication team [20]. In 2021, additional faculty were recruited from the Eastern Association for Surgical Trauma (EAST) Quality, Patient Safety, and Outcomes Committee to redesign the pilot course to provide a surgical focus. Resources specific to our site enhanced our capacity to initiate the program without additional funding sources, and included trained staff and faculty, pre-tested training materials, and volunteer simulated participants (SPs) able to commit two hours/week to the course (Table 1). Universally accessible resources include training scenarios available online, validated tools to assess communication skills, virtual platforms, and a myriad of content experts specifically focused on enhancing the patient experience.

After a needs assessment and gap analysis described previously [21], combined with an appraisal of our resources, we identified opportunities to formalize instruction in patient-centered telehealth communication skills. Second year medical students were recruited from local medical schools via email by classmates who were performing as teaching assistants (TAs). Those responding and registering in the class were offered the option to consent to participate as research subjects and understood that the course was neither required nor graded. We presented the curriculum in 5- weekly modules using Zoom technology (Fig. 1a). In our second year we modified the curriculum to provide

**Table 1** Curriculum development and implementation resources

Resources to facilitate curriculum development and implementation	
Institution specific	Ongoing communication training curricula, with tested simulation scenarios, content, and objectives Patient experience and staff members trained as simulated participants (SPs) Trauma survivors network [25] volunteers: former patients trained as peer mentors, and as SPs Multi-departmental team actively engaged in communication training programs: graduate medical education, surgery, trauma, research, palliative care, simulation center, and social work
Universally available	MedEd portal simulation scenarios [26] Validated assessment tools [27, 28] Virtual platforms (e.g., Zoom, GoTo Meeting): readily available and familiar to students and educators Departments and individuals invested in communication success: patient relations/patient experience, medical educators, social work, palliative care, risk management, and administration Clinical colleagues throughout the hospital, with and without acting experience, eager to be trained as SPs for simulation exercises

**Fig. 1 a** Curriculum Content 2020, **b** Updated Curriculum 2021

Module Focus, Skills, Instructions, Scenarios	
Geriatrics	<i>Skills:</i> Empathy; Ask, Respond with Empathy, Teach (ART Loops)
	<i>Student Instructions:</i> 6-week clinic follow up appointment from open laparoscopic cholecystectomy. Patient has several underlying conditions, lives in a long-term care facility. Patient recently widowed.
	<i>SP Instructions (elderly patient &amp; adult child):</i> Express anxiety re: your recovery, depression, and isolation. <i>Patient prompts:</i> "When do you think I will be able to get out and about again? I don't know how much longer I can live like this." <i>Family (dominating):</i> "How do you know the docs are getting all the right info when they can't actually see my Dad?"
Acute Care Surgery	<i>Skills:</i> Explaining bad news using SPIKES
	<i>Student Instructions</i> Explain need for surgery to family via Facetime. Patient admitted for acute appendicitis 3 days prior, treated with antibiotics until symptoms worsened; the patient is now scheduled for an urgent appendectomy.
	<i>SP Instructions (adult child):</i> Express confusion/anger re: decision for surgery "without the family being informed." Share distress re: patient's confusion/discomfort, pandemic-related visitation restrictions, difficulty obtaining information. <i>Prompts:</i> "Why are you pushing surgery? Is it because the hospital makes more money that way?" "Mom's been taking antibiotics for days; shouldn't she be better?" "Thank you for explaining this but I need to speak to a real doctor."
Rehabilitation	<i>Skills:</i> Managing bias, motivational interviewing
	<i>Student Instructions</i> Take brief history; schedule patient with Dr. Kanumba to address pain management.
	<i>SP Instructions (patient):</i> Inquire into Dr. Kanumba's ethnicity and citizenship; express concern re: possible accent. <i>Prompts:</i> "Could you put me with a doctor without an accent?" <i>Scenario 1:</i> Request motivated by difficulty with accents due to untreated hearing loss. <i>Scenario 2:</i> Request motivated by belief that "foreigners shouldn't be taking American jobs." <i>Prompts:</i> "Kanumba doesn't sound American," "I have the right to request a different doctor - the law is on my side, especially now." <i>Scenario 3 (SP is Latino or Black):</i> Request physician who shares cultural background; motivated by racism experienced by providers. Seek reassurance that doctor will be able to provide culturally sensitive care.
Pediatrics	<i>Skills:</i> Disclosing error, service/relationship recovery
	<i>Student Instructions</i> Contact parent to disclose mistake: you sent prescription to the wrong pharmacy after clinic visit for j-tube assessment following MVC/TBI.
	<i>SP Instructions (parent):</i> Express frustration with delay in treatment and resulting sleepless night. Convey feelings of mistrust and fear. <i>Prompts:</i> "What if something more serious happens in the future? It's hard to trust that this practice won't make another mistake," "Do we need to be concerned about how long it has taken to get her treated?"
Emergency Medicine	<i>Skills:</i> Communicating uncertainty, managing expectations
	<i>Student Instructions</i> Explain need to parent of young adult to be discharged to home from the ED following a motorcycle crash and concussion.
	<i>SP Instructions (parent)</i> Express concern re: patient's diagnoses and care needs. Request clarity re: severity of the concussion. <i>Prompts:</i> "Did you do everything you could to make sure he's okay?" "I'm concerned that it's too early to pick him up, are you sure he's okay?" "Do you know how bad it can get in the next few days?"

surgically focused material and updated the module order to present foundational skills prior to engaging in the more challenging modules such as error disclosure and navigating discussions with racist patients (Fig. 1b).

Each 90 min class began with a 30 min didactic presentation, demonstration, and discussion; lecturers were offered a presentation designed by the TAs and course lead. The lecture presented tools and techniques identified in the literature, such as the SPIKES for breaking bad news, NURSE for responding to emotions, and ADAPT for communicating uncertainty (curriculum summary found in Appendix 1b) [12, 29, 30]. Class #1 focused on empathic responses to patient and family distress and guided the learner through a novel approach to communicating uncertainty [30]. Class #2 offered a more nuanced approach to sharing information,

with a focus on fostering connections with older adults. Class #3 presented the SPIKES [12] protocol for sharing bad news, followed by class #4 in which many of these skills were used to apologize for a medical error. The final class provided students with an approach to responding to micro-aggressions and overt discrimination. [31]

Although brief lectures introduced the topics, we focused on developing a cooperative learning climate to actively engage the learner by demonstrating techniques in short simulations between actors and faculty, encouraging students to reflect on material in the Zoom "chat" function, and providing faculty facilitators with prompts to use in the small break out rooms [22]. We designed practice scenarios to be intentionally challenging; offering a nuanced "real world" simulation and increased competency in the core Entrustable

Fig. 1 (continued)

Module Skills Focus and Instructions All Surgical Scenarios	
Communicating Uncertainty	<i>Didactic Focus:</i> Empathy, Non-Verbal Communication, ADAPT framework: Assess understanding; Disclose uncertainty; Acknowledge emotion; Plan for next steps; Temper expectations.
	<i>Student Instructions</i> Use ADAPT framework to address family concerns regarding patient discharge needs following a motorcycle crash, concussion, shoulder injury.
	<i>SP Instructions (family)</i> Express concern re: patient's diagnoses & care needs. Request clarity re: concussion severity. <i>Example prompts:</i> "Did you do everything you could to make sure he's okay?" "I'm worried that it's too early to take him home. Are you sure he's okay?" "Do you know how bad it can get in the next few days?"
ART Loops, Geriatrics	<i>Didactic Focus:</i> Empathy; Ask, Respond with Empathy, Teach (ART Loops)
	<i>Student Instructions:</i> 4-week phone follow up from colon resection and colostomy. Patient has several underlying conditions, lives in a long-term care facility. Patient recently widowed.
	<i>SP Instructions (elderly patient &amp; adult child):</i> Express anxiety re: your recovery, depression, and isolation. <i>Patient prompts:</i> "I'm embarrassed that I have a colostomy, worried what people will think about me, and feeling bad about myself/losing self-esteem because of it." <i>Family (anxious):</i> "How can I help Dad maintain a social life with this bag?"
Bad News	<i>Didactic Focus:</i> Explaining bad news using SPIKES
	<i>Student Instructions</i> Patient admitted for acute appendicitis, treated 3 days with antibiotics until symptoms worsened; the patient is now scheduled for an urgent appendectomy. Use SPIKES to address family concerns.
	<i>SP Instructions (adult child):</i> Express confusion/anger re: errors "without the family being informed." Share distress re: patient's confusion/discomfort, difficulty obtaining information. <i>Example prompts:</i> "Why are you pushing surgery? Is it because the hospital makes more money that way?" "Mom's been taking antibiotics; shouldn't she be better?" "Thank you for explaining, but can I speak to a real doctor?"
Error & Apology	<i>Didactic Focus:</i> Disclosing error, service/relationship recovery
	<i>Student Instructions</i> Patient admitted for colostomy; post-op Lovenox initiated before heparin drip discontinued resulting in episode of hematemesis. Medication error discovered, corrected, and patient hemodynamically stable. Student to acknowledge/apologize for error, affirm team commitment to mitigate harm.
	<i>SP Instructions (parent):</i> Express feelings of mistrust and fear. <i>Example prompts:</i> "What if something more serious happens in the future? It's hard to trust that this team won't make another mistake," "Do we need to move him to another hospital?"
Responding to Bias	<i>Didactic Focus:</i> Managing racism, responding to microaggressions.
	<i>Student Instructions</i> Young patient admitted following MVC, parent at bedside has dismissed all non-white providers. Perform as intern who has information regarding clearance for discharge. Practice responding to parent bias related to intern's youthful appearance.
	<i>SP Instructions (parent):</i> You are exhausted, frightened, worried, angry at the hospital, angry that foreigners are taking American jobs, angry that you don't have a job, angry at your spouse, and you feel shame that you have not been able to protect your daughter from her crazy father/mother (the other parent). You are frustrated when the very young-looking doctor comes to talk about your daughter's care needs. <i>Example prompt:</i> "I'm sure you're very nice, but I really need to talk to someone who's - no offense - got real medical experience."

Professional Activities of interpersonal and communication skills. [32]

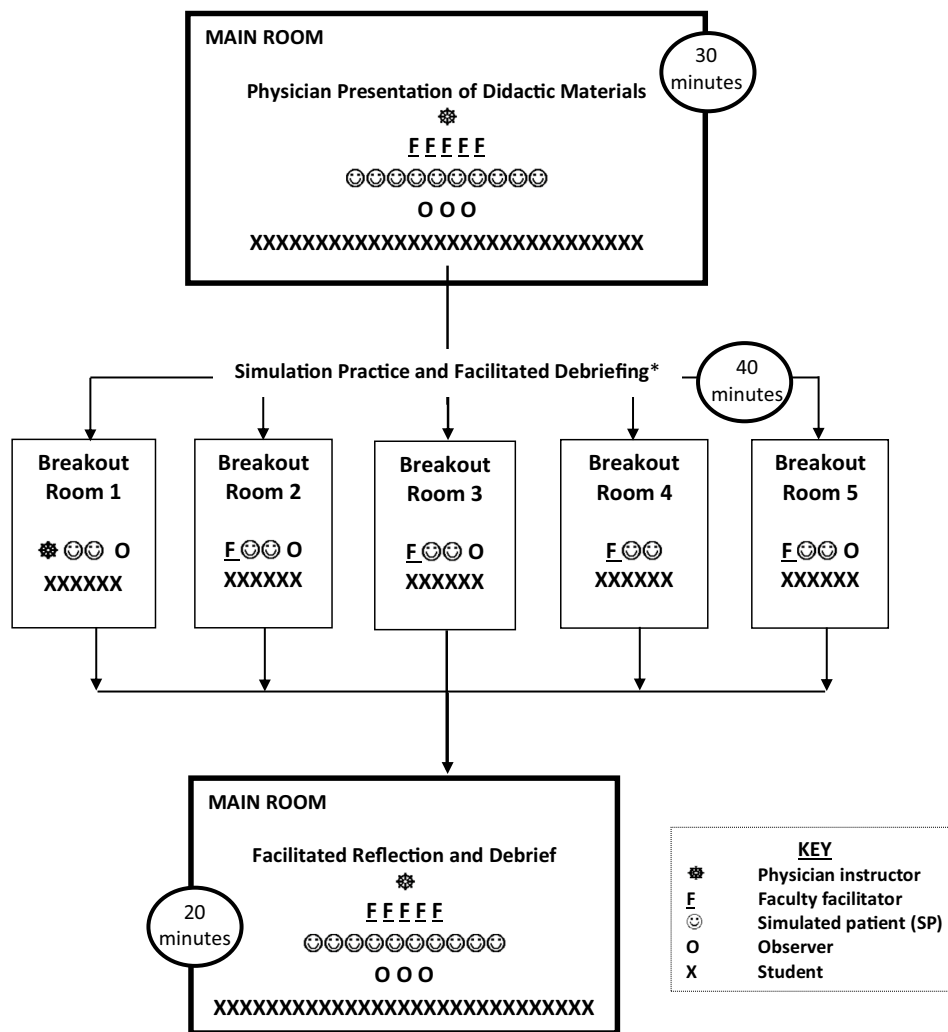
Lectures were followed by 40 min of small group (3–5 students) skills practice and feedback with actors and closed with 20 min of debriefing in the large group (Fig. 2). Small group facilitators—including the lecturers and communication professionals—attended a 30 min meeting prior to the course to receive training on our approach to encouraging interaction during small group feedback discussions (Appendix A). Students were assigned either a "primary" or "secondary" role when engaged in simulation; the secondary role was used as a "lifeline," to provide support or assistance as needed. After 5–10 min of skills practice, the facilitator engaged all group members in discussion, encouraging self-reflection and compassionate feedback. This routine was repeated, allowing a second set of students to practice. While

the scenario remained the same in the second round, the faculty facilitator directed the SP to alter their performance to provide a new experience for the group. All groups returned to the main room for final debrief and reflection.

Skill levels during role play were assessed by the SP and students observing the simulation using the 14 item, physician specific Communication Assessment Tool (CAT) [27]. The CAT has been recommended by the Accreditation Council for Graduate Medical Education (ACGME) for inclusion in the 2009 ACGME Toolbox [33] due to its high internal consistency and validity for patient interactions, validated in SP and observer populations [34]. Students were sent the assessment tool prior to the start of the course to enable them to become familiar with the criteria; SPs had assessed students and surgical residents in previous simulations using the CAT. Data were collected by a research team

Fig. 2 Managing Simulation Using Zoom Breakout Rooms

### Managing Simulation Using Zoom Breakout Rooms



- \*1) Student and SP in simulation keep cameras on; all others mute and turn off cameras 5 mins
- 2) Facilitators manage debrief; all participate w/cameras & microphones on 10 mins
- 3) 2<sup>nd</sup> simulation with different student and SP 5 mins
- 4) 2<sup>nd</sup> facilitated debrief 10 mins

member external to the class; identifiable details were not shared with faculty.

Learners reported confidence levels on module-specific skill objectives before and after the sessions using Likert-type items rated from 1, “no confidence/cannot do it,” to 5, “completely confident/can do it without a problem.” In addition, they provided feedback on what worked well or how the module could be improved in open-ended responses. Multidisciplinary debriefings with learners, SPs and faculty occurred after each course, providing additional, valuable qualitative feedback. All analyses were performed using R Statistical Software (v4.1.2; R Core Team 2021) [35]. Medians and interquartile ranges were reported for confidence

scores and compared using Wilcoxon signed-rank test. *P* values < 0.05 were considered statistically significant. The primary outcome of the CAT is the percentage of “excellent” for each item ranked both years.

### Results

Twenty-eight second year students from two medical schools registered for the communication course in Year 1 (Y1); attendance ranged from 20 to 28 each class. Faculty from two academic medical institutions presented material and facilitated simulations. Twenty-five students from eight

medical schools registered for the course in Year 2 (Y2); 22 students attended all sessions. Faculty from four academic medical institutions led the sessions.

Students reported post-session confidence in their ability to perform target skills that were statistically higher than their pre-session scores, except in the first session of each year (Table 2). The modules with the lowest pre-session confidence for both years were “Disclosing a Medical Error” and “Responding to Patient Bias;” post-session confidence rose significantly for most skills in those classes.

The mean percentage of students receiving “excellent” scores on individual CAT items ranged from 5 to 73% over the course of both years (Table 3). The lowest scores in Y1 were received in the first class in both years, and the highest were received in the final class. Across the 5 weeks, students were rated highest in the behaviors of “Showed care and concern” and “Paid attention to me” and lowest for “Encouraged me to ask questions” and “Checked to be sure I understood everything.”

Verbal and written feedback in Y1 provided direction for the curriculum developers to improve the course in Y2 (Table 4). As such, we reorganized the order of modules in Year 2 to focus on foundational skills in the early sessions, building to the more difficult communication tasks in the fourth and fifth session. Specifically, we moved the most difficult session, “Responding to Patient Bias” from the third session (Y1) to the fifth session (Y2), and moved “Communicating Uncertainty” from the final session in Y1 to the first session in Y2. This enabled us to reflect on the pervasive nature of uncertainty throughout the course, and introduce the foundational skills of empathy and listening carefully to the patient’s concerns early on. Students, faculty, and SPs appreciated the iterative development of the curriculum during the first year; the responsiveness of the curriculum developers gave participants a sense of agency and ownership of the course. One SP noted, “*Seeking our feedback and [taking] it to heart makes [me] feel really valued. I really love that you ask for it and take it very seriously.*”

## Discussion

Designing and implementing a new virtual curriculum is a challenging process with multiple complexities; curricula must be tightly organized and engaging to be effective. Implementation can be facilitated by resources commonly available in academic medical centers, such as staff and former patients eager to be included as SPs, and content experts able to teach a fully prepared session. With the “right” approach, learners, faculty, and colleagues demonstrate that they can be dedicated and engaged participants, despite the possible time burden. Learners agree that communication skills can improve with practice, and system and provider interest in patient–physician

communication appears to increase with the implementation of such a curriculum.

We used the CAT to assess communication skills, as it has been field tested across numerous physician specialties, demonstrating high internal consistency, content, and construct validity for patient interactions. As hoped, observer and SP skills ratings indicated that student performance increased over time. Unsurprisingly, students were rated most competent with behaviors demonstrating empathy and fostering a connection, and least competent when engaging patients in discussions regarding their medical conditions. Despite the ease of using the CAT, we found it challenging to balance delivering an engaging and effective educational module with collecting survey results for both skills assessment and learner feedback. Validating our experience, others have noted a significant drop in student feedback response rates during online classes in the early months of the pandemic [36].

Recognizing that acting in response to participant feedback was a critical step in demonstrating a commitment to our learners and to excellence, we implemented several improvements to our approach during the course. We adapted our training plans to include demonstrations by the experts to enable learners to visualize “best and worst practices” and encourage early participation. We reduced preparation time required for guest speakers by providing a fully formed presentation. We increased class time to allow for demonstrations, extended time during break-out practice and debriefing sessions, and student feedback during large-group debriefing. Lastly, we formalized SP debriefing following emotionally charged sessions. Feedback we were not able to address as easily was the lack of time for all students to practice in each session and the feeling of being rushed in the small group sessions. While increasing class time by 30 min would address these concerns, the expanded time commitment might limit faculty and students’ ability to participate.

Implementation of this training as a study had its challenges, including low confidence survey response rates, limiting the generalizability of our findings. Future directions for this curriculum include providing didactic material asynchronously in a “flipped classroom” model to optimize valuable interactive classroom time, ease the scheduling pressure for faculty presenters, and increase convenience for students. Furthermore, we aim to increase student and faculty recruitment efforts through national organizations representing and supporting students, adding an orientation module for SPs, new faculty, and facilitators.

## Conclusion

Our intensive curriculum for medical students was initially developed to allow students extra “clinical” time during COVID-related restriction. This unique approach

**Table 2** Pre- and post-module skills confidence scores, Years 2020 and 2021

Items paraphrased from original surveys		2020			2021		
		Mean [interquartile range]		<i>P</i>	Mean [confidence interval]		
		PRE	POST	<i>P</i>	PRE	POST	<i>P</i>
		Module 1 ( <i>N</i> =20)			Module 2 ( <i>N</i> =15)		
Ask–Tell–Ask	Explore P/F perceptions, concerns prior to sharing clinical information	3 [3, 4]	4 [3, 4]	0.14	2.5 [2.1,3]	3.5 [3,3.9]	<b>&lt; 0.01</b>
	Using language that is easy to understand for P/F (limiting jargon)	3 [3, 4]	4 [3, 4]	0.59	3.3 [2.7,3.8]	3.8 [3.3,4.3]	<b>&lt; 0.01</b>
	Check for understanding after I share information	4 [3, 4]	4 [3, 4]	0.64	3.3 [2.7,3.8]	3.8 [3.3,4.3]	<b>&lt; 0.01</b>
	Explore concerns in a caring manner when the P/F express concern	3 [3, 4]	4 [3–4.25]	0.06	3.5 [3.1,3.8]	4.1 [3.7,4.5]	<b>&lt; 0.01</b>
	Use silence to allow for open conversation, information processing	3 [3–3]	3 [3, 4]	0.16	2.9 [2.5,3.3]	3.8 [3.2,4.4]	<b>&lt; 0.01</b>
Bad news	Module 2 ( <i>N</i> =17)		Module 3 ( <i>N</i> =15)				
	Explore P/F perceptions, concerns prior to sharing clinical information	3 [3 - 3]	4 [3, 4]	<b>0.01</b>	3.5 [3.1,4]	4 [3.5,4.5]	<b>0.05</b>
	Check for understanding after I share information	3 [3 - 3]	4 [3, 4]	<b>0.03</b>	3.4 [2.9,3.9]	3.9 [3.5,4.4]	<b>&lt; 0.01</b>
	Use paralinguistic and non-verbal tools to demonstrate empathy	3 [3, 4]	3 [3, 4]	0.23	3.5 [3.1,3.9]	4.1 [3.6,4.5]	<b>&lt; 0.01</b>
	Use silence to allow for open conversation, information processing	3 [3 - 3]	3 [3, 4]	0.07	3.3 [2.8,3.8]	3.8 [3.4,4.2]	<b>0.05</b>
Bias	Module 3 ( <i>N</i> =10)		Module 5 ( <i>N</i> =12)				
	Explore the patient's intentions and beliefs before developing a plan	3 [2.3–3]	3.5 [3, 4]	<b>0.03</b>	2.9 [2.5,3.3]	3.7 [3.1,4.2]	<b>&lt; 0.01</b>
	Use reflective listening to demonstrate attention and concern	3 [2.3–3.8]	3.5 [3, 4]	0.07	3.4 [2.9,3.9]	4 [3.5,4.5]	<b>0.01</b>
	Navigate a conversation with P/F who may be eliciting bias	2 [2, 3]	3 [3, 4]	<b>0.02</b>	2.6 [2,3.2]	3.3 [2.7,4]	<b>&lt; 0.01</b>
	Use open-ended questions to explore patient fears and concerns	3 [2.3–3]	3 [3, 4]	0.12	2.8 [2.4,3.3]	3.8 [3.1,4.4]	<b>&lt; 0.01</b>
Error	Module 4 ( <i>N</i> =12)		Module 4 ( <i>N</i> =16)				
	Directly disclose and apologize for a mistake to patients/families	2 [2, 3]	4 [3, 4]	<b>0.01</b>	2.7 [2.2,3.2]	3.8 [3.4,4.2]	<b>&lt; 0.01</b>
	Name the emotion and offer empathic acknowledgment	3 [2, 3]	4 [3, 4]	<b>0.01</b>	3.4 [2.9,4]	4.1 [3.8,4.5]	<b>&lt; 0.01</b>
	For P/F expressing anger, allow them to feel heard	3 [2.75–3]	4 [3.75–4]	<b>0.01</b>	3.2 [2.7,3.7]	4.1 [3.8,4.5]	<b>&lt; 0.01</b>
	For P/F expressing anger, facilitate a shift in perspective	2.5 [2, 3]	3 [2.5–4]	<b>0.04</b>	2.5 [2, 3]	3.75 [3.3,4.2]	<b>&lt; 0.01</b>
Uncertainty	Module 5 ( <i>N</i> =6)		Module 1 ( <i>N</i> =13)				
	Assess the P/F understanding before sharing new information	3 [3–3]	4 [4–4]	0.09	3.3 [2.7,3.9]	3.5 [3,3.9]	0.34
	Directly communicate uncertainty to a patient or family	2 [2–2.75]	4 [3.25–4]	<b>0.05</b>	3 [2.4,3.6]	3.2 [2.7,3.8]	0.27
	Name the P/F emotion and offer empathic acknowledgment	3 [2.25–3]	4 [3.25–4]	0.09	3.4 [2.9,3.9]	3.5 [3.1,3.9]	0.79
	Help P/F to develop realistic expectations	2 [2 - 2]	3 [3–3.75]	<b>0.05</b>	2.9 [2.4,3.3]	2.9 [2.5,3.4]	0.67
	Explore the P/F story when they are upset or distressed	3 [2.25–3]	3.5 [3, 4]	<b>0.04</b>	2.5 [2.1,3]	3.5 [3,3.9]	<b>&lt; 0.01</b>

P/F patient/family, *P* values calculated from Wilcoxon signed-rank test, *P* values in bold have reached statistical significance

**Table 3** Mean “Percent Excellent” Communication Assessment Tool (CAT) Scores, all students combined

All scores: “% excellent” rating received on CAT	Empathy, Ask–Tell–Ask		Discussing bad news		Error disclosure		Uncertainty		All classes [range]
	2020	2021	2020	2021	2020	2021	2020	2021	
Showed care and concern	24	38	42	41	39	26	73	19	37.8 [19–73]
Paid attention to me (looked, listened carefully)	26	28	39	36	43	42	54	19	35.9 [19–54]
Let me talk without interruptions	24	28	35	36	36	37	53	23	34.0 [23–53]
Treated me with respect	33	19	32	27	32	39	19	60	32.6 [19–60]
Talked in terms I could understand	12	25	23	27	29	37	47	24	28.0 [12–47]
Showed interest in my ideas about my health	30	14	14	31	27	26	19	53	26.8 [14–53]
Understood my main health concerns	10	28	23	14	22	26	53	19	24.4 [10–53]
Checked to be sure I understood everything	5	18	23	14	27	11	40	23	20.1 [5–40]
Encouraged me to ask questions	5	23	27	18	27	16	27	14	19.6 [5–27]
Mean score, all items	18.8	24.6	28.7	27.1	31.3	28.9	42.8	28.2	28.8 [19–43]

**Table 4** Illustrative Comments, Year 1

## Suggestions\*

I feel that a little more extra time for practicing would have been helpful

It might have been helpful to see a role play of a scenario prior to our practice session

I wish more resources were sent out prior to class to prepare further and know what to expect

More examples of being assertive as a provider would be helpful

The active portion of the session felt a little hectic and rushed. Not sure that the distribution of time was appropriate

## Challenges

This (“bias class”) was a very hard session, and I really appreciated the feedback and support we all have each other

I do not know if I felt fully prepared to navigate that scenario, but am also unsure of what may have helped me feel more prepared!

## Appreciations

I appreciated the presenter’s insights into their personal experiences with bias in medicine

In general, the conversations we had after the scenarios were helpful to reflect and consider others’ experiences

This (uncertainty) session was great. One of my mentors at school always encourages us to not be afraid to show our cards. It is important for us to be open and honest with our patients and their families and reassure them that we are doing everything we can

I really liked the example scenarios prior to the breakout sessions! [implemented in response to early suggestions]

\*Multiples of each comment received following Class 1 and 2

using former patients and patient experience staff as volunteer SPs facilitates low-cost simulation practice and may be reproducible in other institutions. Partnering with a national organization such as EAST increases student access to training when using a virtual platform. Furthermore, our method resulted in high faculty enthusiasm and support, and active learner engagement. We believe continued focus on patient and family-focused communication

skills will enhance patient care at institutions providing such education, as well as those institutions where medical students are integrated into practice.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s44186-022-00054-9>.

**Data availability** The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.



## Declarations


**Conflict of interest** On behalf of all authors, the corresponding author states that there is no conflict of interest.

## References

- Institute of Medicine (US) Committee on quality of health care in america. crossing the quality chasm: a new health system for the 21st century. Washington (DC): National Academies Press (US); 2001. PMID: 25057539
- Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. *Med Teach*. 2013;35(5):395–403.
- Adams RJ, Smith BJ, Ruffin RE. Impact of the physician's participatory style in asthma outcomes and patient satisfaction. *Ann Allergy Asthma Immunol*. 2001;86(3):263–71.
- Kaplan SH, Greenfield S, Ware JE Jr. Assessing the effects of physician-patient interactions on the outcomes of chronic disease. *Med Care*. 1989;27(3 Suppl):S110-127.
- Stewart MA, McWhinney IR, Buck CW. The doctor/patient relationship and its effect upon outcome. *J R Coll Gen Pract*. 1979;29(199):77–81.
- Rosenbaum ME. Dis-integration of communication in healthcare education: Workplace learning challenges and opportunities. *Patient Educ Couns*. 2017;100(11):2054–61.
- Nicksa GA, Anderson C, Fidler R, Stewart L. Innovative approach using interprofessional simulation to educate surgical residents in technical and nontechnical skills in high-risk clinical scenarios. *JAMA Surg*. 2015;150(3):201–7.
- Markin A, Cabrera-Fernandez DF, Bajoka RM, et al. Impact of a simulation-based communication workshop on resident preparedness for end-of-life communication in the intensive care unit. *Crit Care Res Pract*. 2015;2015: 534879.
- Porcerelli JH, Brennan S, Carty J, Ziadni M, Markova T. Resident ratings of communication skills using the kalamazoo adapted checklist. *J Grad Med Educ*. 2015;7(3):458–61.
- Sukalich S, Elliott JO, Ruffner G. Teaching medical error disclosure to residents using patient-centered simulation training. *Acad Med*. 2014;89(1):136–43.
- Stausmire JM, Cashen CP, Myerholtz L, Buderer N. Measuring general surgery residents' communication skills from the patient's perspective using the communication assessment tool (CAT). *J Surg Educ*. 2015;72(1):108–16.
- Baile WF, Buckman R, Lenzi R, Glober G, Beale EA, Kudelka AP. SPIKES-A six-step protocol for delivering bad news: application to the patient with cancer. *Oncologist*. 2000;5(4):302–11.
- Liasion Committee on Medical Education. Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to the MD Degree; 2019
- Batalden P, Leach D, Swing S, Dreyfus H, Dreyfus S. General competencies and accreditation in graduate medical education. *Health Aff*. 2002;21(5):103–11.
- Holmboe ES, Edgar L, Stan Hamstra C. *The Milestones Guidebook*. 2020 Accreditation Council for Graduate Medical Education
- Wehbe-Janek H, Song J, Shabahang M. An evaluation of the usefulness of the standardized patient methodology in the assessment of surgery residents' communication skills. *J Surg Educ*. 2011;68(3):172–7.
- Hochberg MS, Kalet A, Zabar S, Kachur E, Gillespie C, Berman RS. Can professionalism be taught? Encouraging evidence. *Am J Surg*. 2010;199(1):86–93.
- Larkin AC, Cahan MA, Whalen G, et al. Human emotion and response in surgery (HEARS): a simulation-based curriculum for communication skills, systems-based practice, and professionalism in surgical residency training. *J Am Coll Surg*. 2010;211(2):285–92.
- Yedidia MJ, Gillespie CC, Kachur E, et al. Effect of communications training on medical student performance. *JAMA*. 2003;290(9):1157–65.
- Newcomb AB, Trickey AW, Porrey M, et al. Talk the talk: implementing a communication curriculum for surgical residents. *J Surg Educ*. 2017;74(2):319–28.
- Newcomb AB, Rothberg S, Zewdie M, Duval M, Liu C, Mohess D, Kapadia MR, Kou M, Switzer BE, Port CM, Dort J. Managing patient bias: teaching residents to navigate racism and bias in the workplace. *J Surg Educ*. 2021;78(6):1791–5. <https://doi.org/10.1016/j.jsurg.2021.06.007> (Epub 2021 Jul 18. PMID: 34284944.22).
- Bączek M, Zagańczyk-Bączek M, Szpringer M, Jaroszyński A, Woźakowska-Kapłon B. Students' perception of online learning during the COVID-19 pandemic. *Medicine*. 2021;100(7):e24821.
- Dyrbye L, Cumyn A, Day H, et al. A qualitative study of physicians' experiences with online learning in a master's degree program: benefits, challenges, and proposed solutions. *Med Teach*. 2009;31:40–6.
- Kyaw BM, Posadzki P, Paddock S, et al. Effectiveness of digital education on communication skills among medical students: systematic review and meta-analysis by the digital health education collaboration. *J Med Internet Res*. 2019;21(8): e12967. <https://www.traumasurvivorsnetwork.org/pages/home> Accessed 17 May 2022
- The Sensitive General Surgery Resident: Three "Difficult Conversation" Objective Structured Clinical Examinations. 2013. <https://www.mededportal.org/publication/9490>
- Makoul G, Krupat E, Chang CH. Measuring patient views of physician communication skills: development and testing of the communication assessment tool. *Patient Educ Couns*. 2007;67(3):333–42.
- Petrides KV. Psychometric properties of the trait emotional intelligence questionnaire. In: Stough C, Saklofske DH, Parker JD, editors. *Advances in the assessment of emotional intelligence*. New York: Springer; 2009.
- Back AL, Arnold RM, Baile WF, Tulskey JA, Fryer-Edwards K. Approaching difficult communication tasks in oncology. *Cancer J Clin*. 2005;55:164–77.
- Duval M, Zewdie M, Kapadia MR et al. How to say "I don't know": development and evaluation of workshops for medical students and surgical residents on communicating uncertainty using the ADAPT framework. Under review by *Glob Surg Ed*. 2022
- Wheeler DJ, Zapata J, Davis D, Chou C. Twelve tips for responding to microaggressions and overt discrimination: when the patient offends the learner. *Med Teach*. 2019;41(10):1112–7. <https://doi.org/10.1080/0142159X.2018.1506097>.
- Knowles MS. *The modern practice of adult education*. New York: New York Association Press; 1970. <https://www.aamc.org/what-we-do/mission-areas/medical-education/cbme/core-epas> Accessed 24 Nov 2020
- Swing SR, Clyman SG, Holmboe ES, Williams RG. Advancing resident assessment in graduate medical education. *J Grad Med Educ*. 2009;1(2):278–86.
- Trickey AW, Newcomb AB, Bayless J, Porrey M, Wright J, Piscitani F, Graling P, Dort J. Assessment of surgery residents' interpersonal communication skills: validation evidence for the communication assessment tool in a simulation environment. *J Surgical Ed*. 2016;73(6):e19–27.

35. R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.24
36. Boysen G. Student evaluations of teaching during the COVID-19 pandemic. *Scholarsh Teach Learn Psychol.* 2020. <https://doi.org/10.1037/stl0000222>.
- Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.

## Authors and Affiliations

**Anna B. Newcomb<sup>1,9</sup>**  · **Rachel D. Appelbaum<sup>2</sup>** · **Muneera Kapadia<sup>3</sup>** · **Ryan Dumas<sup>4</sup>** · **Jonathan Dort<sup>5</sup>** · **Eleanor Carey<sup>6</sup>** · **Mannet Dhaliwal<sup>7</sup>** · **Shira Rothberg<sup>5,10</sup>** · **Chang Liu<sup>5</sup>** · **Denise Mohess<sup>8</sup>**

Rachel D. Appelbaum  
rachel.appelbaum@vumc.org

Muneera Kapadia  
Muneera\_Kapadia@med.unc.edu

Ryan Dumas  
Ryan.Dumas@UTSouthwestern.edu

Jonathan Dort  
jonathan.dort@inova.org

Eleanor Carey  
eleanor.carey1@gmail.com

Mannet Dhaliwal  
mkd7jtz@virginia.edu

Shira Rothberg  
shira.rothberg@fairfaxcounty.gov

Chang Liu  
liuchang.stat@gmail.com

Denise Mohess  
Denise.mohess@ynhh.org

<sup>2</sup> Division of Acute Care Surgery, Vanderbilt University Medical Center, Nashville, TN, USA

<sup>3</sup> Division of Gastrointestinal Surgery, UNC School of Medicine, Chapel Hill, NC, USA

<sup>4</sup> Division of General and Acute Care Surgery, UT Southwestern Medical Center, Dallas, TX, USA

<sup>5</sup> Department of Surgery, Inova Fairfax Medical Campus, Falls Church, VA, USA

<sup>6</sup> Department of Global, Community Health at George Mason University, Fairfax, VA, USA

<sup>7</sup> University of Virginia School of Medicine, Charlottesville, VA, USA

<sup>8</sup> Co-Chief Geriatrics Bridgeport Hospital/Milford Campus, Yale New Haven Health System, Milford, CT, USA

<sup>9</sup> Trauma and Acute Care Surgery, Inova Fairfax Medical Campus, Falls Church, VA, USA

<sup>10</sup> Fairfax County Fire and Rescue Department, Fairfax, VA, USA

<sup>1</sup> Division of Trauma and Acute Care Surgery, Inova Fairfax Medical Campus, 3300 Gallows Rd, Falls Church, VA 22042, USA