

**Teaching and Assessing Doctor-Patient Communication using Remote Standardized Patients
and SKYPE: Feedback from Medical Residents.**

Dot Horber, PhD

Director for Continuous Professional Development and Innovations, National Board of Osteopathic Medical Examiners

Erik E. Langenau, DO

Director for Learning Technologies, Philadelphia College of Osteopathic Medicine

Elizabeth Kachur, PhD

Director, Medical Education Development, National and International Consulting

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Authors:

Dot Horber, PhD, Director for Continuous Professional Development and Innovations, National Board of Osteopathic Medical Examiners, 101 W. Elm St., Suite 100, Conshohocken, PA 19428

Erik Langenau, DO, Director for Learning Technologies, Philadelphia College of Osteopathic Medicine, 4170 City Ave, Roland Hall, Suite 216, Philadelphia, PA 19131

Elizabeth Kachur, PhD, Director, Medical Education Development, National & International Consulting, 201 East 21st Street, Suite 2E, New York, 10010

Abstract

Teaching and assessing doctor-patient communication has become a priority in medical education. This pilot study evaluated resident physicians' perceptions of teaching and assessing doctor-patient communication skills related to pain management using a web-based format. Fifty-nine resident physicians completed four doctor-patient clinical encounters conducted with standardized patients (SPs) connected remotely via SKYPE. Quantitative and qualitative program evaluation data included residents' responses to Post-Exercise Surveys and their comments during focus group sessions. The investigation provided valuable information, especially regarding SP feedback received, the technology used and possible uses of this type of assessment in medical education. Future studies will focus on refinements in technology and alternative topics for use in remote clinical encounters.

Introduction

Historically, medical licensure and specialty board certifications have focused primarily on teaching and assessing medical knowledge, with lesser emphasis on other critical elements, such as doctor-patient communication and professionalism. Since 1999, more comprehensive medical competency frameworks have been integrated into the continuum of medical education by the ACGME and the AOA (Accreditation Council on Graduate Medical Education, 2007; American Osteopathic Association, 2004). For the 58,239 osteopathic physicians with active licenses in the United States (Young, Chaudhry, Rhyne and Dugan, 2011), such competencies include osteopathic principles and practice, patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice. These competencies have been defined and formalized, emphasizing

that the competent physician should be educated and well-versed in a variety of domains, not just medical knowledge. The National Board of Osteopathic Medical Examiners (NBOME) has defined these competencies in their Fundamental Osteopathic Medical Competency Domains (FOMCD) document, delineating the specific elements for physician competence (National Board of Osteopathic Medical Examiners, 2011).

This shift in focus also provides an opportunity to explore new teaching methods and assessment strategies. Numerous studies have cited the importance of teaching and assessing doctor-patient communication skills (Teutsch, 2003; Duffy, Gordon, Whelan, Cole-Kelly, & Frankel, 2004). Traditionally, training programs have relied on face-to-face interaction through the use of live patients, standardized patients (SPs) and Objective Structured Clinical Examinations (OSCEs) (Boulet, Smee, Dillon, & Gimpel, 2009). Currently, only 12.3% of residency training programs utilize standardized patient (SP) examinations, and only a small percentage utilize OSCEs (Holt, Miller & Nasca, 2010). These performance-based assessments provide opportunities to evaluate doctor-patient communication skills, but they are expensive and typically require learners to travel to the face-to-face encounters.

To overcome these challenges some educators have explored web-based OSCEs or “Tele-OSCEs” as an adjunct for teaching doctor-patient communication. (Daetwyer, Cohen, Gracely, & Novak, 2010; Novack, Cohen, Peitzman, Beadenkopf, Gracely, & Morris, 2002). Such novel web-based training and assessments proved to provide meaningful communication skills instructions and assessments with greater flexibility for learners.

Building on some of these findings, we decided to conduct a pilot study and built a similar program for residents to investigate the feasibility and user acceptance of this modality-formative encounters with remote standardized patients (RSPs) – using Skype as a cost effective video conferencing system. We chose pain management as the topic in focus because it is an issue of concern to all specialties and there are evidence-based strategies that combine communication skills and medical knowledge for addressing clinical problems. Furthermore, there is also an opportunity to address Osteopathic Manipulative Therapy-related issues. This article will summarize quantitative and qualitative feedback from the project participants, their views of the benefits and challenges of this educational method.

Method

For our pilot, we recruited osteopathic medical residents, a total of 59, randomly sampled, from a pool of 416 who responded to the Invitation to Participate letter that was emailed to all successful completers of COMLEX-USA Levels 2 CE and PE during the 2008 through 2011 testing cycles (N= 18,520). Residents who completed the study were offered and received a \$100 gift check and were entered into a raffle to win another \$100 check.

Nine RSPs were recruited, five from the East Coast and four from the West Coast. These RSPs were selected based on demographics, experience with OSCEs, comfort with technology, and

willingness to work from home. All received training in case portrayal, feedback delivery as well as the technologies to be used, from an experienced medical educator.

Online sessions. Each resident participated in four 30-minute online sessions related to the assessment and counseling of pain. Each session consisted of the following components:

- A 15-minute clinical encounter during which the resident physician's tasks were to obtain a patient history, address the patient's concerns regarding the reported pain and discuss treatment options;
- A 5-minute "time-out" during which the resident completed a self-assessment survey while the RSP rated the resident's communication skills and recorded the content areas that were addressed;
- A 10-minute immediate debriefing and feedback session guided by the RSP.

The four clinical encounters included the following cases that were ambulatory in nature: chest pain (non-cardiac), headache following an automobile accident (referred pain), long-standing intermittent low back pain (opioid use/abuse) and rotator cuff shoulder pain (overuse injury). In advance of the remote encounter, the resident was provided with a Case Introduction that included the patient's chief complaint and the resident physician's task. The Case Introduction for the "chest pain" case is included in Appendix 1.

Assessments. For each encounter, the following written assessments were completed right after each encounter:

- Doctor-patient Communication Case-Specific Checklist consisting of 10 to 15 items, relating to the resident's medical history-taking during the encounter. It was completed by the RSP. A sample of the "chest pain" Case Checklist is included in Appendix 2.
- Doctor-patient Global Communication Assessment, an NBOME-created Global Communication Assessment, reviewed and endorsed by NBOME's Clinical Skills Testing Advisory Committee. It is based on validated assessments such as Kalamazoo Essential Elements Communication Checklist (Adapted) (Joyce, Steenbergh, & Scher, 2010). It was completed by the RSP. The Global Communication Assessment is included in Appendix 3.
- Doctor-Patient Communication Self-Assessment, using the same scale, rubric and instructions from the Global Communication Assessment described above. It was completed by the resident physician during the 5 minute "time-out" and is included in Appendix 4. Technology Report, a summary of the experiences with Skype and other technologies used during each doctor-patient encounter. This report, completed by the RSP, is included in Appendix 5.

The completed assessments were emailed to the resident together with case-specific Teaching Points, within two days after the encounter to further enhance the learning experience.

Following completion of all four encounters, participating residents were invited by email to complete an online Post-Exercise Survey designed to obtain opinions on training format, the

technologies used, the feedback provided and their overall experiences. The Survey consisted of 52 Likert-type items with four response options (Strongly Disagree, Disagree, Agree, Strongly Agree) arranged in 10 sections with open-ended comments permitted for each section, as well as an adjective checklist to capture global impressions.

In addition, each participant was invited to join a one-hour focus group session that was conducted via conference call and was facilitated by an experienced medical educator.

In summary, a variety of quantitative and qualitative measures were administered during the study. The Case Specific Checklist, the Global Communication Assessment and the Self-Assessment provided ratings of the residents' performance during the encounter, while the Post Exercise Survey and focus group responses provided information related to the residents' experience and acceptance of this formative assessment. As the stated purpose of this paper deals with medical residents' feedback on this web-based formative assessment, the results will concentrate on the analyses of the Post-Exercise Surveys and the focus groups.

Results

Sample. The participating sample consisted of 26 men and 33 women who represented 23 different states, and who reported to have graduated from 22 different colleges of osteopathic medicine. They represented various medical specialties and training levels as shown in Table 1.

Table 1. Demographics of Participating Sample of 59 Residents

Gender	56% female
	44% male
Specialty	27% Family Medicine
	20% Internal Medicine
	10% OB/GYN
	8% Emergency Medicine
	8% Pediatrics
	27% Other
Training Level	27% (1st year)
	41% (2nd year)
	24% (3rd year)
	8% (Other)

Based on the AACOM Matriculate Report, the gender ratio as well as the race and ethnicity of the participant sample is fairly representative of the total 2009 – 2011 classes entering colleges of osteopathic medicine, with a slightly greater percentage of women participants.

(<http://www.aacom.org/data/applicantsmatriculants/Documents/2011Matriculantssummary.pdf>).

Post-Exercise Survey. All 59 participating residents completed the Post-Exercise Survey. The residents' responses to the individual items, together with comments to each section are included in Appendix 6. A sample of the responses to the Survey's General Questions is included below in Table 2.

Table 2. Selected Responses to General Questions from the Post-Exercise Survey from Participating Residents (n=59)

General	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
The web-based format was convenient for me.	1 (.017)	1 (.017)	29 (.491)	28 (.475)	0
This was a practical learning experience.	1 (.017)	1 (.017)	29 (.491)	28 (.475)	0
The web-based format was effective in teaching me communication skills.	0	6 (.102)	30 (.508)	23 (.390)	0
Sample General Comments					
I find web based is much more difficult than in person.					
I had to learn to translate my skills into a manner that would accomplish the same thing over Skype.					
Talking to someone over Skype is nowhere near the same as in person. There are expressions and movements that are not conveyed over Skype. Also eliminating the physical exam prevents the doctor from asking questions during the exam. Every time there was a glitch with the audio it threw off my thought process.					
This was definitely more convenient than attending a scheduled lecture, however slightly less convenient than completing an online module.					
When the technology is not working perfectly, it also serves as a disruption and a distraction.					

As can be seen from Table 2, the overall response to the pilot study was very positive, with 97% considering it to be a practical learning exercise. Ninety percent felt that the web-based format was effective in teaching communication skills.

Feedback provided to the residents by the RSP was an important component of the study. Based on the survey, virtually all participants (58 of 59) agreed or strongly agreed that the overall format for receiving verbal feedback from the RSP was valuable. One resident expressed the value of immediate feedback by stating "Immediate feedback was very effective. That's something that OSCEs at medical school did not offer."

Many residents reported on having gained an improved ability to manage pain. Eighty-five percent of the participants agreed or strongly agreed that the encounters increased their ability not only to elicit a pain history from patients but also their comfort in doing so. Similarly, 86% felt that the exercises increased their ability to counsel patients about pain-related issues and treatment, while 90% reported an increased comfort in providing counseling. In addition, as osteopathic physicians, 73% agreed or strongly agreed that they felt confident in their ability to

describe Osteopathic Manipulative Treatment as a management option for reducing pain. Despite residents' support for the effectiveness of the exercises, quite a few of the comments expressed ambivalence toward the web format, stating that "it was difficult to be empathetic through a video conference" and "I felt like there was a disconnection."

Table 3 illustrates a sample of residents' responses to the overall experience of the study.

Table 3. Selected Responses to Overall Experience questions from the Post-Exercise Survey from Participating Residents (n=59)

Overall Experience	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
I prefer this web-based format to traditional face-to-face clinical exercises.	19 (.322)	28 (.475)	9 (.153)	3 (.051)	0
The amount of work required for this exercise was appropriate.	0	1 (.017)	46 (.780)	12 (.203)	0
As a result of this exercise, I feel more confident in my ability to communicate with my patients with regard to pain.	3 (.051)	7 (.119)	37 (.627)	10 (.169)	2 (.034)
I would recommend this communication exercise to my colleagues.	2 (.034)	7 (.119)	34 (.577)	14 (.237)	2 (.034)
I would register for another web-based exercise like this in the future.	2 (.034)	3 (.051)	33 (.559)	19 (.322)	2 (.034)
I was satisfied with the overall experience (web-based exercise).	1 (.017)	2 (.034)	33 (.559)	22 (.373)	1 (.017)

While the large majority of participating residents, 80%, did not prefer this web-based format to traditional face-to-face clinical exercises, the same number reported that they felt more confident in their ability to communicate with patients regarding pain, providing support for the effectiveness of these exercises. Comments supported the preference for face-to-face encounters, stating "Regarding communication, the web based exercise was effective. In a true clinical scenario, it is still inferior to a face-to-face." In support for the web-based format, 88% stated that they would register for another web-based exercise like this in the future and the vast majority, 93%, stated that they were satisfied with the overall experience of this web-based exercise.

Focus Group Discussions. Fifty-two of the residents participated in the 11 focus group sessions that were conducted within a 7 week time span. As indicated, the focus group sessions were facilitated by an experienced medical educator and followed a predefined framework of questions. Participants were informed that the discussion would be recorded for the purpose of transcription and further analysis. In conducting the analysis, each session transcript was analyzed regarding topics addressed and consistent themes were identified across the sessions.

Across the 11 focus group discussions, several major themes emerged. The most common theme centered on the importance and value of the immediate verbal feedback offered by the RSPs which permitted interaction that written feedback does not allow. As stated by one

resident, "...once you get into residency, I don't know if we necessarily get feedback on our communication skills. It's much more about clinical decision making. So it was cool to get to remind yourself of how the patient is hearing you with your thought process and how you can improve." Many residents stated that communicating with a patient via Skype was more difficult initially, but as the encounters progressed, they became more comfortable and felt more effective as they were better able to use the feedback they had been given in previous encounters. One resident stated, "Probably the best thing I took away from this experience, the verbal feedback from the patients about my interviewing style."

A second important theme related to the residents' emphasis of the importance of hands-on physical exams for history taking and diagnosis, particularly for osteopathic physicians. As one resident stated, "...as an osteopath, one of our principles is to put your hand on the patient." As stated by another, "If we ever practice medicine like this, really it would be sad. There are so many things you pick up on during physical exams from patients.....I just think this would be a bad way to practice medicine but as far as training people on how to take histories, it's a good way on how to be more compassionate."

Another theme voiced by participants was interest in telemedicine and wanting to learn more about its use in medicine's future. One resident stated that these encounters "...got me a little more interested in telemedicine and realizing that it's not just a phone call....on the other side, there's a patient and they're having problems and it's not just like a computer you're talking to." Residents proposed other topics that would be appropriate to a web-based format including breaking bad news to a patient, counseling topics such as smoking cessation and psychiatric topics such as depression.

For most residents, it was a valuable experience: "I really didn't think I was going to gain as much as I've gained. I thought it was just a matter of participating in a research program. I've learned so much, I've learned what my deficiencies are; it contributed a lot to my education."

To summarize, the results of the Post-Encounter Survey and the focus group discussions are very supportive of each other. Both emphasized the value and appreciation of immediate verbal feedback, the value of this online format as a learning experience but not as a replacement for an in-person clinical exam.

Discussion

As a pilot, this study presented valuable information regarding the possible use of such web-based learning in medical education. This study was innovative in many ways. It investigated the novel use of technology, Skype, in a web-based educational module that taught doctor-patient communication skills using formative assessments. It developed the concept and role of the RSP and included the presentation of not just written feedback, but immediate verbal feedback as well, something that is often neglected in the medical education process.

However, the study was conducted primarily as a pilot, with a novel approach and an eye toward next steps. While there were many aspects of this study that worked very well, the success of some elements could be improved.

In addition, while the results of the Post-Exercise Survey suggested that most RSPs and residents considered Skype easy to use, there were nevertheless technology challenges that occurred for various reasons. Some of the most common problems included dropped calls, poor video quality due to high Skype volume and poor audio quality resulting in an annoying "echo," which was distracting. Some residents reported difficulties with visualizing subtle expressions. Future studies may consider alternatives to Skype. Since participation in the study was voluntary there is a possible selection bias toward residents more open to novel technologies. Furthermore, the sample size was small and limited to osteopathic residents; a larger and more diverse sample could provide more generalizability.

Nevertheless, despite the challenges and limitations, this pilot provided support for continuing research in the use of web-based OSCEs as a formative assessment for doctor-patient communication, offering an educational format that is practice relevant. Future research will focus on considering other topics, particularly counseling-related, for the teaching and formative assessment of doctor-patient communication skills. A more in-depth analysis of the content of the focus group discussion is planned, together with the inclusion of additional raters to confirm inter-rater consistency. Additional exploratory studies are planned with practicing physicians to address continuous medical certification requirements.

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Appendix 1 Case Introduction for the Chest Pain Case

CASE 101P: Case Introduction

Patient Name	Linda Smith
Age	48 yo
Setting of Visit	Primary Care Office
Background	This is this first time you are seeing the patient. She has no insurance and is “self-pay.” Given the patient is new to your practice, past medical history is unknown to you.
Chief Complaint	“I have a pain in my chest and I’ve got 2 kids to take care of.”
Vital Signs	
Resp Rate	18
Heart Rate	104
Blood Press	136/82

Physician Task

- 1. Obtain a pain history**
- 2. Address the patient’s concerns and pain’s impact on daily living**
- 3. Discuss further evaluation and/or treatment options**

*Note: You are not to conduct a physical exam. Therefore, please refrain from asking the patient to disrobe, perform range of motion testing, or conduct other physical examination maneuvers.

Appendix 2 Chest Pain Checklist

Case 101P Chest Pain

Physician: _____

RSP: _____

Date: _____

Time: _____

	No	Yes	Comments
Checklist Items			
1. Location (e.g. "Where is the pain located?")			
2. Palliation (e.g. "What do you do to make the pain better?")			
3. Provocation (e.g. "What makes the pain worse?")			
4. Quality (e.g. "What is the pain like?" "Is it dull or sharp?")			
5. Radiation (e.g. "Does the pain radiate anywhere?")			
6. Severity (e.g. "On a scale of 1-10, how would you rate the pain?")			
7. Associated Symptoms (e.g. "Any other symptoms with the pain?" "Any dizziness, nausea?")			
8. Timing (e.g. "How long has the pain been present?" "Is it constant?")			
9. PMH (e.g. "Do you have any medical problems?")			
10. Impact on daily living (e.g. "What are you worried about?")			
11. Diagnosis/prognosis (e.g. "The pain is most likely musculoskeletal, not heart related")			
12. Alternative treatments (e.g. "Treatments may include OMT, physical therapy, rest")			

Appendix 3 Doctor-patient Global Communication Assessment



Global Communication Assessment (Continuous Professional Development)*

PHYSICIAN'S NAME: _____ RATER'S NAME: _____ CASE NUMBER: _____

1. BUILDS THE RELATIONSHIP	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> Doesn't express care or concern (verbally &/or non-verbally) Does not adjust tone or pace to patient's needs Interrupts or redirects frequently Shows no interest in psychosocial issues, only focuses on biomedical issues Fails to share talk time; verbally dominates 		<ul style="list-style-type: none"> Uses words and non-verbal cues that demonstrate care & concern Adjusts tone and pace to patient's needs Listens, encourages patient's participation, and redirects appropriately Shows interest in psychosocial and biomedical issues Shares talk time; no verbal dominance 	
2. OPENS THE DISCUSSION (BEGINNING OF INTERVIEW)	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> Interrupts patient's opening statements Does not elicit full set of concerns Does not summarize goals for the visit 		<ul style="list-style-type: none"> Allows patient to complete opening statement without interruption Asks "anything else?" to elicit full set of concerns Summarizes goals for visit 	
3. GATHERS INFORMATION	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> Does not balance open-ended and close-ended questions Ignores patient's expression or clues about concerns Prematurely narrows the focus of the interview Flow is illogical and disorganized Doesn't indicate transitions Doesn't summarize 		<ul style="list-style-type: none"> Balances open-ended and close-ended questions Responds to verbal & nonverbal clues Refocuses the interview as important biomedical or psychosocial information arise Flow is logical and organized Indicates transitions Summarizes and gives patient opportunity to correct or add information 	
4. UNDERSTAND THE PATIENT'S PERSPECTIVE	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> Doesn't elicit patient's beliefs, concerns & expectations about illness & treatment Doesn't acknowledge and validate patient's perspective Doesn't ask about patient's understanding of illness or situation 		<ul style="list-style-type: none"> Elicits patient's beliefs, concerns & expectations about illness & treatment Acknowledges and validates patient's perspective Asks about patient's understanding of illness or situation 	
5. SHARES INFORMATION	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> Uses medical jargon & gives overly technical information Doesn't explain symptoms, diagnostic tests, diagnosis and/or treatment options Doesn't verify patient's understanding of information 		<ul style="list-style-type: none"> Explains using words patient can understand Gives clear explanation of symptoms, diagnostic tests, diagnosis and/or treatment options Verifies patient's understanding of the information standing of illness or situation 	

6. REACHES AGREEMENT	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY	
	<ul style="list-style-type: none"> • Makes decisions for patient without discussion of patient's role • Does not discuss pros/cons of options & uncertainties • Does not verify patient's understanding of options • Does not explore patient's preferences • Does not propose mutually agreeable decision 		<ul style="list-style-type: none"> • Discusses patient's role in decision making • Discusses pros/cons of options & uncertainties associated with decision • Verifies patient's understanding of options • Explores patient's preferences • Proposes mutually agreeable decision 		
7. PROVIDES CLOSURE	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY	
	<p>Doesn't ask about remaining questions</p> <p>Doesn't summarize next steps or follow-up</p>		<ul style="list-style-type: none"> • Asks if patient has any remaining questions • Summarizes next steps and follow-up 		
8. OVERALL PATIENT SATISFACTION	<input type="checkbox"/> 1 NOT SATISFIED (would not return to this physician or recommend him/her to family/friends)		<input type="checkbox"/> 2 SOMEWHAT SATISFIED (would prefer not to return to this physician or recommend him/her to family/friends)	<input type="checkbox"/> 3 MOSTLY SATISFIED (would be willing to return to this physician and may recommend him/her to family/friends)	<input type="checkbox"/> 4 VERY SATISFIED (would definitely return to this physician and strongly recommend him/her to family/friends)
IRREGULARITIES AND RATING DIFFICULTIES					
GENERAL COMMENTS AND REFLECTIONS					

*Informed by Essential Communication Elements, Kalamazoo Consensus Statement. Duffy FD, Gordon GH, Whelan G, Cole-Kelly K, Frankel R. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. Academic Medicine. 2004;79(6):495-507.

Appendix 4 -Doctor-Patient Communication Self-Assessment



Physician Self-Assessment: Global Communication Assessment (Continuous Professional Development)*

YOUR NAME: _____ CASE NUMBER: _____

DATE: _____

1. BUILDS THE RELATIONSHIP	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Doesn't express care or concern (verbally &/or non-verbally) • Does not adjust tone or pace to patient's needs • Interrupts or redirects frequently • Shows no interest in psychosocial issues, only focuses on biomedical issues • Fails to share talk time; verbally dominates 		<ul style="list-style-type: none"> • Uses words and non-verbal cues that demonstrate care & concern • Adjusts tone and pace to patient's needs • Listens, encourages patient's participation, and redirects appropriately • Shows interest in psychosocial and biomedical issues • Shares talk time; no verbal dominance 	
2. OPENS THE DISCUSSION (BEGINNING OF INTERVIEW)	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Interrupts patient's opening statements • Does not elicit full set of concerns • Does not summarize goals for the visit 		<ul style="list-style-type: none"> • Allows patient to complete opening statement without interruption • Asks "anything else?" to elicit full set of concerns • Summarizes goals for visit 	
3. GATHERS INFORMATION	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Does not balance open-ended and close-ended questions • Ignores patient's expression or clues about concerns • Prematurely narrows the focus of the interview • Flow is illogical and disorganized • Doesn't indicate transitions • Doesn't summarize 		<ul style="list-style-type: none"> • Balances open-ended and close-ended questions • Responds to verbal & nonverbal clues • Refocuses the interview as important biomedical or psychosocial information arise • Flow is logical and organized • Indicates transitions • Summarizes and gives patient opportunity to correct or add information 	
4. UNDERSTAND THE PATIENT'S PERSPECTIVE	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Doesn't elicit patient's beliefs, concerns & expectations about illness & treatment • Doesn't acknowledge and validate patient's perspective • Doesn't ask about patient's understanding of illness or situation 		<ul style="list-style-type: none"> • Elicits patient's beliefs, concerns & expectations about illness & treatment • Acknowledges and validates patient's perspective • Asks about patient's understanding of illness or situation 	

5. SHARES INFORMATION	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Uses medical jargon & gives overly technical information • Doesn't explain symptoms, diagnostic tests, diagnosis and/or treatment options • Doesn't verify patient's understanding of information 		<ul style="list-style-type: none"> • Explains using words patient can understand • Gives clear explanation of symptoms, diagnostic tests, diagnosis and/or treatment options • Verifies patient's understanding of the information 	

6. REACHES AGREEMENT	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Makes decisions for patient without discussion of patient's role • Does not discuss pros/cons of options & uncertainties • Does not verify patient's understanding of options • Does not explore patient's preferences • Does not propose mutually agreeable decision 		<ul style="list-style-type: none"> • Discusses patient's role in decision making • Discusses pros/cons of options & uncertainties associated with decision • Verifies patient's understanding of options • Explores patient's preferences • Proposes mutually agreeable decision 	

7. PROVIDES CLOSURE	<input type="checkbox"/> 1 NEEDS MUCH IMPROVEMENT	<input type="checkbox"/> 2 NEEDS SOME IMPROVEMENT	<input type="checkbox"/> 3 DONE ADEQUATELY	<input type="checkbox"/> 4 DONE EXCELLENTLY
	<ul style="list-style-type: none"> • Doesn't ask about remaining questions • Doesn't summarize next steps or follow-up 		<ul style="list-style-type: none"> • Asks if patient has any remaining questions • Summarizes next steps and follow-up 	

8. OVERALL PATIENT SATISFACTION	<input type="checkbox"/> 1 NOT SATISFIED (The patient would not return to me or recommend me to family/friends)	<input type="checkbox"/> 2 SOMEWHAT SATISFIED (The patient would most likely not return to me or recommend me to family/friends)	<input type="checkbox"/> 3 MOSTLY SATISFIED (The patient would be willing to return to me and may recommend me to family/friends)	<input type="checkbox"/> 4 VERY SATISFIED (The patient would definitely return to me and strongly recommend me to family/friends)

GENERAL COMMENTS	
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REFLECTIONS	
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*Informed from Essential Communication Elements, Kalamazoo Consensus Statement. Duffy FD, Gordon GH, Whelan G, Cole-Kelly K, Frankel R. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. Academic Medicine. 2004;79(6):495-507.

Appendix 5 Technology Report

Encounter Technology Report

The information below is requested as a record of any technology difficulties or other irregularities you encountered during your session.

RSP Name: _____

Case #: _____

Resident Name: _____

Date/Time: _____

Did record the encounter? yes no

Did record the feedback session? yes no

Did you upload the recordings? yes no

Did the encounter any technical difficulties during the encounter? yes

no

Comments / Irregularities:

Did you have any difficulty completing the Checklist and Global Assessment forms?

yes no

Comments/ Irregularities:

Did you encounter any difficulties with the feedback session? yes no

Comments / Irregularities:

Thank you again for participating in this innovative research project! If you have questions or need further support, please let us know.

Appendix 6 Responses to physician post-exercise survey (n=59)

General	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
The web-based format was convenient for me.	1	1	29	28	0
This was a practical learning experience.	1	1	29	28	0
The web-based format was effective in teaching me communication skills.	0	6	30	23	0
Technology	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
I am familiar with Skype (e.g., I have used Skype before this exercise).	5	8	22	24	0
I am familiar with other video conferencing programs (similar to Skype).	6	19	18	14	2
I found Skype easy to use.	0	1	25	33	0
I found the Technology Instructions For Physicians document useful for completing the exercise.	0	1	28	23	7
I found the “Technology Check” (call in hours) with the NBOME helpful.	0	1	10	12	36
I found the NBOME staff helpful when addressing technology-related issues	0	2	9	11	37
I did not experience any technical difficulties during the encounters.	11	23	15	8	2
Scheduling	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
Scheduling encounters was easy.	0	2	25	32	0
Email was an effective communication tool for scheduling the encounter.	0	1	20	38	0
Staff members responsible for scheduling were professional.	0	0	12	47	0
Remote Standardized Patient Experience	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
I was able to communicate easily with the Remote Standardized Patients (RSPs).	0	4	39	16	0
I was able to get the information I needed from the Remote Standardized Patients (RSPs).	0	4	35	20	0
Exercises increased my awareness of addressing patients’ concerns related to pain.	1	10	29	19	0
Exercises increased my ability to elicit a comprehensive pain history.	1	8	35	15	0
Exercises increased my comfort in eliciting a comprehensive pain history from patients.	1	7	36	14	1
Exercises increased my ability to counsel patients about pain-related issues and treatment.	1	6	40	11	1
Exercises increased my comfort in counseling patients about pain-related issues and treatment.	1	5	42	11	0

I felt confident in my ability to describe Osteopathic Manipulative Treatment (OMT) as a management option for reducing pain.	0	12	28	15	4
Remote Standardized Patients (RSPs) were professional.	0	0	22	37	0
Believability of Cases	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
The portrayal of the Chest Pain Case was believable.	0	1	34	24	0
The portrayal of the Headache Case was believable.	0	1	32	26	0
The portrayal of the Low Back Pain Case was believable.	0	0	29	30	0
The portrayal of the Shoulder Pain Case was believable.	1	5	31	22	0
Verbal Feedback	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
The overall format for receiving verbal feedback (from the Remote Standardized Patient) was valuable.	0	1	32	26	0
The verbal feedback I received from the Chest Pain Case was valuable.	1	1	30	27	0
The verbal feedback I received from the Headache Case was valuable.	0	4	33	22	0
The verbal feedback I received from the Low Back Pain Case was valuable.	0	2	31	26	0
The verbal feedback I received from the Shoulder Pain Case was valuable.	1	6	28	24	0
Written Assessment (Global Assessment)	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
The process of completing the self-assessment forms was valuable.	1	11	39	8	0
Information provided in the global communication assessment (completed by the RSP) was valuable.	0	1	37	21	0
Information provided in the global communication assessment (completed by the RSP) was an accurate assessment of my performance during the exercise.	0	3	42	14	0
Written Assessment (Checklist)	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
Information provided in the Chest Pain Checklist was valuable.	0	3	40	16	0
Information provided in the Chest Pain Checklist was an accurate assessment of my performance during the encounter.	0	3	41	15	0
Information provided in the Headache Checklist was valuable.	0	3	42	14	0
Information provided in the Headache Checklist was an accurate assessment of my performance during the encounter.	0	5	42	12	0
Information provided in the Low Back Pain Checklist was valuable.	0	2	42	15	0

Information provided in the Low Back Pain Checklist was an accurate assessment of my performance during the encounter.	0	4	41	14	0
Information provided in the Shoulder Pain Checklist was valuable.	0	2	41	16	0
Information provided in the Shoulder Pain Checklist was an accurate assessment of my performance during the encounter.	1	3	42	13	0
Teaching Points	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
The Chest Pain Teaching Points were valuable.	0	5	35	19	0
The Headache Teaching Points were valuable.	0	4	36	19	0
The Low Back Pain Teaching Points were valuable.	0	5	35	19	0
The Shoulder Pain Teaching Points were valuable.	0	7	33	19	0
Overall Experience	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
I prefer this web-based format to traditional face-to-face clinical exercises.	19	28	9	3	0
The amount of work required for this exercise was appropriate.	0	1	46	12	0
As a result of this exercise, I feel more confident in my ability to communicate with my patients with regard to pain.	3	7	37	10	2
I would recommend this communication exercise to my colleagues.	2	7	34	14	2
I would register for another web-based exercise like this in the future.	2	3	33	19	2
I was satisfied with the overall experience (web-based exercise).	1	2	33	22	1