Use of an innovative video feedback technique to enhance communication skills training

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CONTEXT Despite growing interest in medical communication by certification bodies, significant methodological and logistic challenges are evident in experiential methods of instruction.

OBJECTIVE There were three study objectives: 1) to explore the acceptability of an innovative video feedback programme to residents and faculty; 2) to evaluate a brief teaching intervention comprising the video feedback innovation when linked to a one-hour didactic and role-play teaching session on paediatric residents' communication with a simulated patient; and 3) to explore the impact of resident gender on communication change.

DESIGN Pre/post comparison of residents' performance in videotaped interviews with simulated patients before and after the teaching intervention. Individually tailored feedback on targeted communication skills was facilitated by embedding the Roter Interaction Analysis System (RIAS) within a software platform that presents a fully coded interview with instant search and review features.

SETTING/PARTICIPANTS 28 first year residents in a large, urban, paediatric residency programme.

RESULTS Communication changes following the teaching intervention were demonstrated through significant improvements in residents' performance with simulated patients pre and post teaching and feedback. Using paired *t*-tests, differences include: reduced verbal dominance; increased use of open-ended questions; increased use of empathy; and increased partnership building and problem solving for therapeutic regimen adherence. Female residents demonstrated greater communication change than males.

CONCLUSIONS The RIAS embedded CD-ROM provides a flexible structure for individually tailoring feedback of targeted communication skills that is effective in facilitating communication change as part of a very brief teaching intervention.

KEYWORDS communication; education, medical, undergraduate, *method, ethnology; feedback; physician patient relation; videotape recording, methods

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INTRODUCTION

A growing literature has linked patient–physician communication to a host of valued patient outcomes, including improvements in markers of disease control such as haemoglobin A1C and blood pressure, reports of enhanced physical and emotional health status, and better performance in activities of daily living.[1] As a result, physicians' communication skills have attracted increasing attention as a source of variation in the quality of care.[2] The linking of communication skill and quality of care has not gone unnoticed by medical educators, credential bodies, and managed care organizations. The past decade has seen two international consensus statements by expert groups of medical educators recommending the development and implementation of communication skills

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Key learning points

While video feedback approaches to the teaching of communication skills have proven superior to more traditionally didactic methods, significant methodological and logistic challenges hamper widespread use.

Linking an interaction analysis system to video review through an interactive CD-ROM platform facilitates the feedback process.

A short teaching intervention that included the feedback innovation and a one-hour didactic and role-playing session produced changes in residents' communication behaviours, including a reduction in verbal dominance, increased use of open-ended questions, increased use of empathy, and increased partnership building and problem solving for therapeutic regimen adherence.

Female residents demonstrated greater changes in communication as a result of the teaching intervention than male residents.

teaching and assessment programmes in medical schools.[3,4]

There is substantial evidence that communication skills can be taught and that physicians' interviewing performance can be improved.[3–6] Furthermore, as reviewed by Aspegren, there is compelling evidence that experiential methods of communication skill instruction are superior to more traditionally didactic approaches.[6] In particular, studies of video review and feedback of student performance in interviews have consistently produced positive gains in communication skills. Despite the evidence of success as an effective educational strategy, only a minority of communication training programmes provide systematic feedback to trainees on videotaped performance with patients or patient surrogates such as simulated patients.[5,6]

This is not surprising; significant methodological and logistic challenges have plagued video feedback efforts.[7–10] These challenges are generally related to the time and cost associated with faculty training and preparation for feedback sessions. Especially troublesome is the common practice of starting a video review at the visit's opening and continuing in a 'discovery' mode until the time allocated for the feedback session runs out. As a result, a disproportionate allocation of time may be given to exchanges that appear early in the visit while later exchanges may receive little, if any, attention.[8] Even when critical incidents are identified prior to the review, technical difficulties and time needed to locate the incidents are often noted as a common frustration.[7–9] Finally, while there are a number of communication assessment tools available, few studies have directly linked skill assessment to video feedback.

A software programme linking interaction analysis to video review through an interactive CD-ROM platform was developed to address some of these challenges. The current study was designed to explore the acceptability of the feedback programme to residents and faculty and to evaluate the impact of the feedback approach when linked to a one-hour didactic and role-play teaching session on paediatric residents' communication with a simulated patient. As a recent meta-analysis has demonstrated substantial gender-linked differences in the communication style of male and female physicians[11] and the training literature notes that female students have scored better than males in several communication skills courses,[6] the study further explored the impact of physician gender on our results.

METHODS

The study design is a pre/post evaluation of a communication skills teaching intervention. Participants were 28 paediatric residents in their first year of postgraduate medical training in a large urban medical centre. The average age of study participants was 27 and the majority ($n = 19$; 68%) were female.

Communication teaching intervention

The combined teaching and feedback intervention took a total of four hours spread over approximately 4 weeks; two hours of this time was devoted to direct instruction and feedback and two hours were devoted to the conduct of simulated patient interviews. First year paediatric residents were assigned at random to one of three standardized scenarios, discussing discharge planning and follow-up care with the parent/guardian of a child who had been hospitalized after a crisis with asthma, diabetes or sickle cell disease. Depending on which scenario was

assigned first, one of the two alternative scenarios was chosen for the post-training, evaluative interview conducted one month later. Six different simulated patients representing the three different study cases were used across the pre and post condition sessions. The simulated patients were blind to whether their interviews (or the case that they presented) constituted a pre or post condition and were also blind to the coding categories making up the video analysis.

The resident was directed to take 15 min for the simulated interview that was videotaped. After the interview, the resident completed a communication self-assessment checklist. This checklist was not reviewed with the resident.

The first simulated interview served two purposes: it constituted the baseline observation of the resident's use of communication skills and it supplied material for the individualized, structured feedback using the interactive CD-ROM, as described below.

In week two, residents (in groups of two) participated in a one-hour didactic and role-playing practice session, based generally on the Three Function Model of Medical Interviewing.[12] Special focus was given to four core skill areas:

1 listening more/talking less;

2 data gathering techniques using open-ended questions to probe patient's knowledge, perceptions of care, treatment preferences, and lifestyle and psychosocial issues;

3 responding to the parent/guardian's emotions;

4 building an active partnership for problem solving related to the therapeutic regimen.

During the third week of the module, the resident and faculty preceptor spent one hour reviewing the coded videotape within an interactive CD-ROM platform focusing on areas of communication related to the prior week's didactic and role-playing session.

A second simulated interview was conducted in the fourth week for evaluation purposes and was similarly RIAS-coded as the first. This interview constituted the comparative measure for assessment of changes in communication skills. Faculty did not provide feedback to residents on their performance in this interview.

RIAS coding of videotapes

Videotapes of the residents' simulated patient interviews were up-loaded to a PC and converted to digitized files in an AVI file format. These files were saved to a writable CD-ROM. The digital file was then coded with newly adapted RIAS software. The interviews were coded without transcription, as in earlier RIAS software applications; however, the new software takes advantage of the digitized format by attaching a location stamp to each RIAS code. This coding produces a completely indexed videotape record with a menu that allows search and retrieve features.

The RIAS assigns a code to each complete thought, usually expressed as a simple sentence, clause or single word during the visit, by either patient or physician, into one of 38 mutually exclusive and exhaustive categories. The communication categories relate broadly to the socioemotional and task-focused functions of the visit. Socioemotional communication includes categories related to the expression, and response to emotions, positive, negative, and social exchange, and active partnership-building. Task focused communication includes categories of data gathering and patient education and counselling about the medical condition and symptoms, treatment regimens, and lifestyle and psychosocial issues.

Separate from the RIAS categories of interaction, three adherence related problem-solving skills were coded:

1 the use of problem-solving probes (e.g. Can you think of some ways to work around the problem?)

2 problem-solving assistance (e.g. would a prescription for a 2 months' supply help?);

3 partnership and support (e.g. be sure to call if you think of anything else you want to ask).

Since the current study reports the first use of the digital software platform for RIAS coding of videotape, all 56 interviews were checked to assure consistency in the application of the system and to fully explore any unanticipated areas of coding difficulty introduced by the new software. The first coding of each interview was done by one of two experienced RIAS coders. Each coder was assigned only one interview per resident and coders were blind to the pre or post feedback status of the interview. A coding check of every interview was done by an expert in the

RIAS system with 25 years' experience training coders and a contributor to the development of the new software (author S.L.). No significant problems were found in the coding.

A second video-based study using the digital software platform was completed shortly after the current study and reliability was assessed on a 10% random sample of double-coded interviews. The levels of intercoder reliability for this study averaged 0.90 for physician categories and 0.89 for patient categories (unpublished data). These levels are slightly higher than those reported in earlier RIAS studies, in which reliability has ranged across categories from roughly 0.70 to 0.90.[13,14]

Table 1 provides examples of RIAS coded categories and specific skills.

Video feedback CD-ROM

Uses of the feedback software were demonstrated to the faculty by its developers (D.R. and S.L.) followed by a discussion of the software's many features and ways in which it may be used in providing a structured, yet flexible and individually tailored feedback session to residents. Four faculty members shared responsibility for conduct of the feedback sessions; assignment of residents to a faculty preceptor was based on scheduling convenience. Trial sessions using the software were observed by S.L. and a consensus was reached among the faculty for the review procedure.

Guided by the interactive screen (displayed in Fig. 1), the four areas of skill addressed in the didactic/role-playing session (listening more/talking less, use of open-ended questions and probes, responding to patient emotions, and building an active partnership for problem solving) were reviewed. The emphasis and sequence of feedback was individually tailored to those areas of need identified by the resident. The feedback sessions lasted approximately one hour and included the following:

Listening more/talking less Feedback often began with discussion of the percentage of total dialogue contributed by each speaker. (For example, in Fig. 1, the proportions are 53% of talk contributed by the physician and 47% by the patient, displayed on the far right of the screen.) Inspection of the dialogue hatching across the top width of the screen is useful in that it provides a compelling graphic representation of the interactive qualities of the dialogue. The hatch marks represent the timing and sequence of statements made by both physician (top) and patient (bottom). Relative spacing along the horizontal bar reflects the rapidity with which consecutive statements are made by a single speaker. Dense clusters along the physician axis are often markers for 'monologue bursts' – uninterrupted speech streams during which the physician is usually instructing or counselling the patient – with little patient response. Of course, not all segments that appear physician dominated reflect poor counselling skills and patient disengagement; nevertheless, these segments are generally productive points of discussion. Recognition of potentially problematic monologues and how they might be broken down (for instance by asking for patient understanding, opinion, or agreement) often followed inspection of the hatch bar. In contrast, segments of talk characterized by frequent turn taking mark dialogue in which both speakers are fully engaged. Gaps in the hatch markings indicated silence or pauses, which were also discussed.

Data gathering techniques using open-ended questions For feedback in this area, the menu on the left hand side of the screen was used to identify and review instances of open question use across each of the content areas (i.e. medical history, therapeutic regimen, lifestyle and psychosocial issues, anticipatory guidance). Review of patient responses prompted discussion and illustration of how and when open questions, particularly in the realm of therapeutic regimen and psychosocial issues, were productive in eliciting meaningful patient disclosure. For those residents who had asked few open questions, a review of close-ended questions spurred a discussion of missed opportunities for an open probe or practice in recasting a question in a more open manner.

Responding to the parent's emotions The feedback screen was used to retrieve instances of responsiveness to the parent's expression of emotion, with special emphasis on use of empathy and legitimation. If empathy or legitimation statements did not occur, a review of the statements of concern allowed the opportunity to consider the variety of ways in which the resident may have, or could have, responded to these disclosures. A review of the resident's statements of concern or reassurance often prompted reflection on possible limitations in his or her repertoire of responses to expressions of emotion.

Building an active partnership for problem solving Building an active partnership for problem solving related

Table 1 Categories of Roter Interaction Analysis System

Functional grouping	Communication behavior	Example
Data gathering	Open-ended questions: medical (medical condition, therapeutic regimen) Open-ended questions: psychosocial (lifestyle, social, and psychological)	What can you tell me about the pain? How are the meds working? What are you doing to keep yourself healthy? What's happening with your father?
	Closed-ended questions: medical (medical condition, therapeutic regimen) Closed-ended questions: psychosocial (lifestyle, social, and psychological)	Does it hurt now? Are you taking your meds? Are you still smoking? Is your wife back?
Patient education and counselling	Biomedical information-giving (medical condition; therapeutic regimen)	The medication may make you drowsy. You need it for 10 days.
	Psychosocial and lifestyle information (feelings and emotions, lifestyle and self-care information)	The community centre is good for company and you can get meals there.
	Biomedical counselling (persuasive statements regarding medical management and therapeutic regimen)	It's important to take those pills everyday, I don't want you to miss any. Watch that foot for infection, Be sure to keep it clean and you won't have a problem.
	Psychosocial counseling (persuasive statements regarding lifestyle, social, and psychological issues)	Getting exercise is a good idea, especially now. The most important thing you can do is just quit-just do it! It's important to get out and do something with someone every day.
Responding to emotions	Social talk (nonmedical chit-chat) Positive talk (agreements, jokes, approval, laughter) Negative talk (disagreements, criticisms)	How about them O's last night? You look fantastic, you are doing great. I think you are wrong, you weren't being careful. No, I do want that.
	Emotional talk (concerns, reassurance, legitimation, empathy)	I'm worried about that. I'm sure it will get better. We'll get through this.
Activation and partnership building	Participatory facilitators (asking for patient opinion, asking for understanding, restatement of patient disclosures, back-channels)	What do you think it is? Do you follow me? I heard you say you didn't like that. Let me make sure I've got it right...Uh-huh, right, go on, hmm.
	Procedural talk (orientation; transitions)	I'll first look at your rash and then take your blood pressure. I'll be back in a minute. Well, ok. Now...

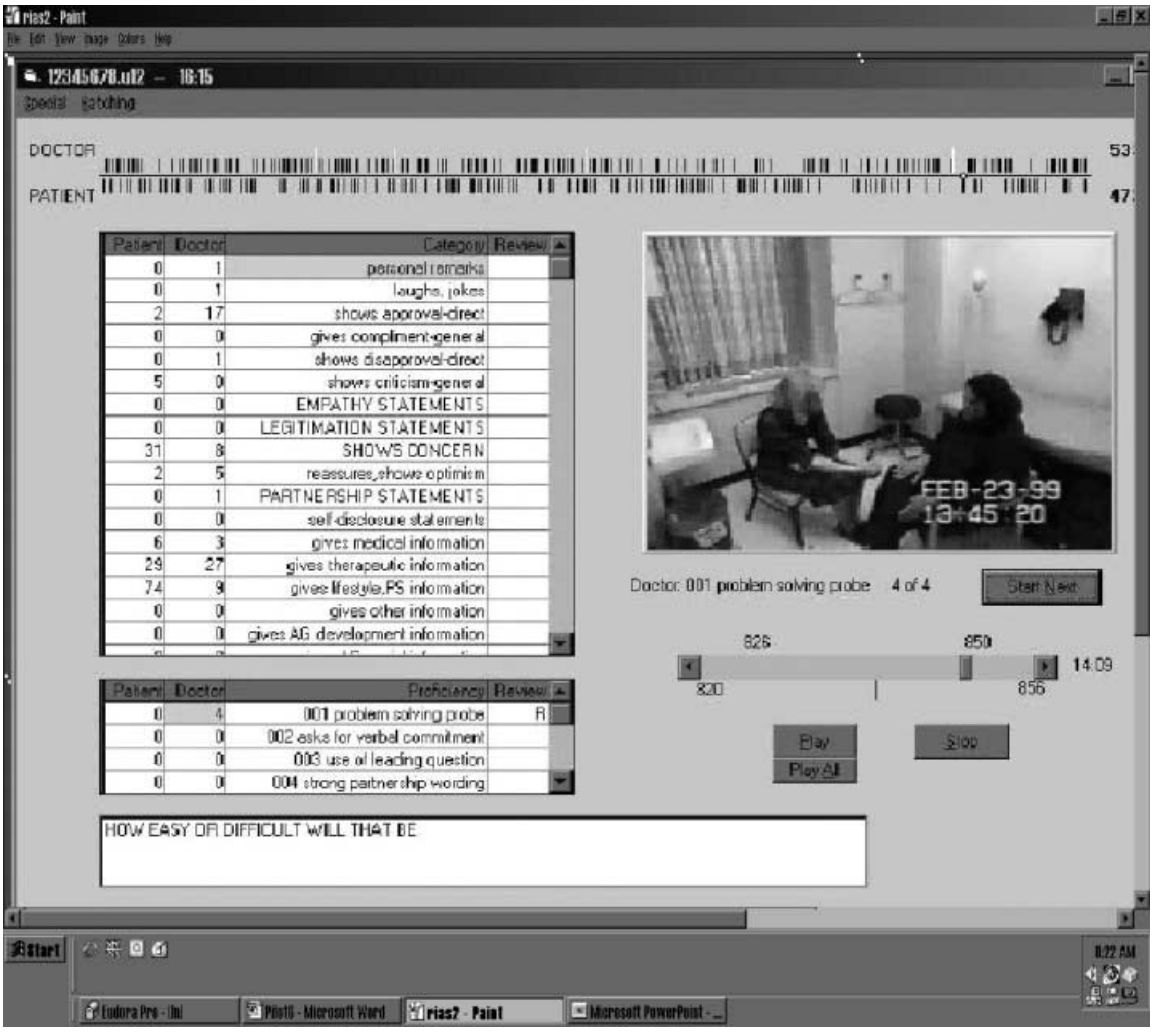

Figure 1 Feedback on the use of specific RIAS categories is structured through the menu on the left hand side of the screen. The summaries for 'Doctor' and 'Patient' represent the total number of utterances coded, by speaker, for each RIAS category for that interview. To review examples of specific RIAS categories of talk, the tally box for either the Doctor or Patient next to the category (e.g. the '5' under the Reassures/Shows Optimism) is selected. When selected, the category appears under the video box. If 'Start First' is clicked, the first example will be retrieved. If 'Start Next' is clicked, the second coded reassurance statement is retrieved, and so on. With retrieval of an RIAS category, the target statements are highlighted as hatch marks in the area across the top of the screen to provide a context for the exchange relative to its position in the visit. In addition, the first statement in a category is transcribed to assist the learner in identifying the target statement. This verbatim text appears at the bottom of the screen. Each retrieved statement is presented within its verbal context by automatic playback of several statements prior to and after the targetted statement. This context window can be adjusted based on time (usually all talk +/− 5 seconds) or by number of statements (usually +/−3 statements). When the video is activated, a tracking ball follows along with the sequential record of coded statements. A time stamp indicates elapsed time into the interview at which the statement occurs.

to the therapeutic regimen was reviewed in the feedback session in two ways. The first was through a review of RIAS codes related to patient activation and partnership (e.g. asking for patient opinion, asking for patient understanding, restatement of patient disclosures) were reviewed. Second, three adherence related problem-solving and negotiating strategies were reviewed and discussed (problem-solving probes, problem-solving assistance, and statements of partnership and support).

Analytic strategy

Acceptability of the feedback innovation was reported by resident questionnaire following completion of the training. Faculty report was anecdotal throughout the process. The combined impact of the teaching and feedback session was assessed by comparing resident performance in the simulated interviews pre and post feedback. Key communication categories were identified as reflecting each of the four skill areas covered during the teaching session and reinforced during feedback, as described earlier. The analytic strategy uses paired *t*-tests on key communication categories (based on scores for each resident derived from the first and second simulated encounter) and Wilcoxon signed ranks test to further explore the direction of change for the communication variables by each of the study participants. The impact of physician gender on study results was explored by stratifying the residents by gender (males = 9; females = 19) and replicating the Wilcoxon signed ranks test.

RESULTS

Acceptability of the feedback innovation

Residents found the feedback session to be helpful; 86% of the residents reported that the feedback session was productive in improving their clinical skills. The faculty using the CD-ROM to guide their feedback to residents preferred it to more traditional approaches of using feedback as a teaching vehicle.

Assessment of the four key skill areas

Listening more/talking less The length of time taken for the simulated encounter increased by 2 minutes – from 13.4 to 15.8 min – in post-training sessions. This increase was present in the visits of 24 of the 28 residents. As shown in Table 2, the increase in time observed in the post-training simulation is accounted for almost entirely by an increase in patient talk (averaging 30%), rather than an increase in physician talk (averaging 4%). Reflecting this change, the ratio of the medical dialogue that was contributed by the physician relative to the patient decreased for 22 of the residents and fell from 2.1 : 1 pretraining to 1.7 : 1 following feedback. Table 2a presents a stratified analysis of this result by resident gender. It is evident from the Table that both male and female residents increased the length of their consultations but diminished the extent to which they verbally dominated the visit by facilitating greater patient input to the visit's dialogue.

Expressed in regression terms, the bulk of the variance in pretraining simulation length is accounted for by physician talk, with a small additional change in explained variance contributed by patient talk (Adjusted R square = 0.74; change in R square = 0.04; standardized beta coefficient = 0.65, $P < 0.000$ for physicians and 0.29, $P < 0.05$ for patients). The regression model for the post-training simulation length was associated only with the contribution of patient talk (Adjusted R square = 0.28; standardized beta coefficient = 0.53, $P < 0.005$ for patients and 0.015, $P < 0.95$ for physicians).

Data gathering As displayed in Table 3, the number of open-ended questions increased significantly from

Table 2 Communication characteristics pre and post educational programme

	Pre-training Mean (SD)	Post-training Mean (SD)	Paired *t*-statistic	Negative change	Positive change	No change	Wilcoxon Z
Length of simulation	13.4 (3.2)	15.8 (2.1)	3.5**	4	24	0	3.1**
Physician talk	220.5 (65.3)	228.0 (50.1)	0.6	14	14	0	0.6
Patient talk	105.3 (46.7)	136.3 (36.0)	2.6*	6	22	0	3.0**
Ratio of talk, physician : patient	2.2 (.5)	1.7 (.4)	3.7**	6	22	0	3.3**

*$P < 0.05$; **$P < 0.001$.

Table 2a Gender effects associated with communication changes pre and post educational programme

	Male residents ($n = 9$)				Female residents ($n = 19$)			
	Negative change	Positive change	No change	Wilcoxon Z	Negative change	Positive change	No change	Wilcoxon Z
Length of simulation	2	7	0	1.6 +	2	17	0	2.8**
Physician talk	5	4	0	0.8	9	10	0	0.1
Patient talk	1	8	0	1.8 +	5	14	0	2.4*
Ratio of talk, physician : patient	6	3	0	1.7 +	16	3	0	2.8**

+$P < 0.1$; *$P < 0.05$; **$P < 0.001$.

Table 3 Frequency of targetted communication categories pre and post educational programme

	Pre-training Mean (SD)	Post-training Mean (SD)	Paired *t*-statistic	Negative change	Positive change	No change	Wilcoxon Z
Data gathering							
Open-ended questions (all)	6.6 (4.5)	10.6 (4.2)	3.9**	4	19	5	3.2**
Lifestyle/psychosocial	3.0 (2.6)	5.0 (2.7)	3.2**	8	18	2	2.8**
Therapeutic regimen	2.3 (2.4)	4.0 (2.4)	2.7*	6	21	1	2.6**
Medical symptoms/history	1.2 (1.1)	1.6 (1.5)	0.9	9	12	7	0.8
Closed-ended questions (all)	16.5 (7.8)	21.6 (9.1)	2.4*	9	17	2	2.2*
Lifestyle/psychosocial	6.5 (5.9)	9.4 (5.4)	1.9 +	10	16	2	1.7 +
Therapeutic regimen	6.4 (3.7)	8.6 (5.1)	1.9 +	7	17	4	1.9 +
Medical symptoms/history	3.6 (2.7)	3.6 (2.9)	0.0	12	13	3	0.1
Building a relationship							
Reassurance	18.7 (13.8)	12.2 (7.9)	2.1*	18	10	0	1.7 +
Concern	13.5 (9.8)	13.1 (5.3)	0.2	13	15	0	0.4
Empathy	1.9 (1.8)	2.8 (1.9)	2.3*	6	16	6	2.1*
Legitimation	0.7 (1.1)	1.5 (1.5)	0.6	7	8	13	0.5
Activating and partnering							
Re-statement	8.7 (6.0)	10.1 (5.9)	1.2	9	19	0	1.5
Asks patient opinion	4.1 (3.1)	7.3 (3.9)	3.4**	6	21	1	2.8**
Asks understanding	10.8 (8.3)	7.6 (6.3)	2.4*	18	9	1	2.4*
Back channels	4.1 (4.8)	6.6 (6.2)	2.1*	6	16	6	2.7**
Problem-solving and negotiation skills							
Problem-solving probes	0.6 (0.7)	2.0 (1.7)	3.9*	2	17	9	3.5**
Problem-solving assistance	0.4 (0.8)	1.2 (1.4)	2.6*	4	12	12	2.3*
Partnership and support	0.4 (0.8)	1.2 (1.4)	2.6*	4	12	12	2.2*

+$P < 0.1$; *$P < 0.05$; ** $P < 0.001$.

pre to post-training in two areas – lifestyle and psychosocial issues and therapeutic regimen. When stratified by gender, an increase in open-ended questions is evident for both male and female residents; however, the pattern is more pronounced among females, including a trend toward increased open-questions in the area of medical history and symptoms (see Table 3a).

Table 3a Frequency of targetted communication categories pre and post educational programme

	Male residents ($n = 9$)				Female residents ($n = 19$)			
	Negative change	Positive change	No change	Wilcoxon Z	Negative change	Positive change	No change	Wilcoxon Z
Data gathering								
Open-ended questions (all)	2	5	2	1.4	2	14	3	2.8**
Lifestyle/psychosocial	2	6	1	1.8 +	6	12	1	2.1*
Therapeutic regimen	2	6	1	1.5	4	15	0	2.2*
Medical symptoms/history	4	2	3	1.0	5	10	4	1.8 +
Closed-ended questions (all)	2	7	0	2.2*	7	10	2	1.2
Lifestyle/psychosocial	3	4	2	0.8	7	12	0	1.4
Therapeutic regimen	1	7	1	2.1*	6	10	3	0.9
Medical symptoms/history	5	4	0	0.9	7	9	3	0.9
Building a relationship								
Reassurance	5	4	0	0.5	13	6	0	1.8 +
Concern	3	6	0	1.0	10	9	0	0.1
Empathy	2	6	1	1.1	4	10	5	1.9 +
Legitimation	3	3	3	0.1	4	5	10	0.66
Activating and partnering								
Re-statement	2	7	0	2.0*	7	12	0	0.7
Asks patient opinion	3	6	0	1.4	3	15	1	2.5**
Asks understanding	4	4	1	0.4	14	5	0	2.4*
Back channels	3	3	3	0.3	3	13	3	2.5**
Problem-solving skills								
Problem-solving probes	1	5	3	1.8 +	1	12	6	3.0**
Problem-solving assistance	0	4	5	1.8 +	4	8	7	1.5
Partnership and support	3	4	2	1.4	1	8	10	2.0*

+$P < 0.1$; *$P < 0.05$; ** $P < 0.001$.

Residents also increased the number of closed-ended questions they asked overall; however, changes in specific categories are not as strong as those for open-ended questions and only tend toward statistical significance for lifestyle and psychosocial issues and therapeutic regimen. The stratified analysis shows a statistically significant shift in the use of closed-ended therapeutic regimen questions only for male residents (Table 3a).

Responding to the patient's emotions Table 3 shows a significant increase in the expression of empathy in post-training simulations. Legitimation statements were also reviewed in training but use of this category of communication did not change in any consistent way. Use of reassurance and concern statements was not stressed in the training, but they were reviewed during the feedback session to facilitate resident reflection on the range of their emotional repertoire, particularly in response to expressed patient concerns (which were also reviewed). Reassurance statements showed a significant shift downward as a result of training, as 18 residents reduced their number of reassurance statements (10 residents increased performance in this area). Overall, the average number of reassurance statements dropped substantially, from 19 to 12 per interview. Concern statements appeared unchanged.

The stratified analysis (Table 3a) suggests more change in these areas of communication for female rather than male residents. There is a trend toward greater use of empathy statements (the male residents also show a less pronounced directional shift) as well as a trend indicating diminished use of reassurance statements by female residents. There were no gender effects evident for concern or legitimation statements.

Active partnership building Activating exchanges were evaluated by the use of four different categories: asking for patient opinion, asking for patient under-

standing, using back channels, and re-stating patient disclosures through interpretation or paraphrase. Table 3 shows statistically significant changes in three of these areas – increases were evident for the categories of asking for patient opinion and the use of back channels, whereas a decrease was evident in asking if the patient understood the physician's communication. Re-statements of patient disclosures were unchanged. The stratified gender analysis in Table 3a shows that the upward shift in asking for opinion and back channels and the downward shift in asking for understanding, were reflected in significant changes in the communication of female residents. A significant increase in re-statements of patient disclosures was evident only in male residents' communication.

Table 3 also shows significant increases in all three of the problem-solving skills emphasized in the training – problem-solving probes, problem-solving assistance, and partnership and support statements. Of the 28 residents in the programme, 24 showed a positive shift in their use of at least one of these skills.

The stratified analysis (Table 3a) indicates positive shifts for both male and female residents in problem-solving probes; however, only males appeared to increase problem-solving assistance, while females articulated partnership and support for patients.

A positive shift in the use of at least one of these skills was evident for eight of the nine male residents and 16 of the 19 female residents.

DISCUSSION

Our findings add to a growing consensus among medical educators regarding the power of experiential methods of communication skill instruction to effectively contribute to the teaching and learning of communication skills.[6] Our training intervention was effective in producing significant changes in residents' communication skills in each of four targeted areas: listening more/talking less, more open-ended data gathering techniques, more sensitive response to patients' emotions, and building an active patient partnership related to problem solving. We have also contributed to the small body of work examining the effects of physician gender on medical communication and the learning of communication skills.[6,10] In this regard we confirm earlier findings that female learners score better than their male counterparts after a communication course.

Both male and female residents showed gains in the use of open psychosocial questions and problem-solving skills. The changes especially evident for female physicians were in areas of communication that are known to be gender-linked; significant or near significant changes were evident in psychosocial questions, emotionally focused talk, and active partnership behaviours.[11] Most notable changes for male residents were in increased close-ended questions about the therapeutic regimen and increases in re-statement of patient disclosures. These strategies may also be seen as consistent with a more directive and male-linked conversational style.[14]

Female residents did not increase communication across the board; the two communication categories that showed a downward shift in use, reassurance and asking for patient understanding, were evident only for the female residents. As noted earlier, a review of the resident's statements of concern or reassurance often prompted reflection on limitations in his or her repertoire of responses to patient emotion. We have not conducted a content analysis to investigate any changes in the way reassurance may have been expressed; but based on our experience in providing resident feedback on these statements we speculate that it may have been an 'overused' category. Others have also found that premature or inauthentic reassurance may be unproductive.[11,15] In this light, the reduction in use of reassurance may signal heightened sensitivity or a broadening of the resident's emotional repertoire to include other emotionally explicit responses. The gender analysis would seem to support this hypothesis, as female physicians tended both to reduce reassurances and to increase empathy statements.

Perhaps in a somewhat similar vein, the decrease in the number of statements asking if patients understood what was said may also mark a more successful dialogue in which lowered verbal dominance, more open question asking, and partnership and problem solving helped establish an effective working partnership that diminished the need to ask explicitly for patient understanding. Again, the gender analysis found that it was female residents who shifted downward in this category of communication.

Aspegren has noted in his review of communication skills training that males are slower learners than women, citing four studies in which females scored better than males after a training course.[6] Our study adds to this small body of literature by adjusting for gender differences at baseline. We similarly conclude that female residents show more change in

communication as a result of training than their male counterparts, even when accounting for higher baseline levels of skill.

Questionnaire results and the anecdotal reports of the residents and preceptors suggest that interviews coded with the RIAS and presented within the interactive CD-ROM platform are an acceptable and efficient vehicle for video-based feedback. Use of the system is easily mastered and does not necessitate extensive training. Furthermore, the system provides faculty with a workable structure that allows for both tailoring and individualization of feedback while providing a standard template for analysis of targeted skills. The search and review features allow for easy navigation of the entire interview and provide both a 'forest and trees' view of the visit's interaction from beginning to end.

While providing benefits, RIAS coding does require resources. Our time estimate for the coding of a videotaped interview and production of the CD-ROM is approximately three times the length of the encounter – about 30 minutes of coding for a 10-minute interview. Coders used in our projects are college graduates with a background in the social sciences, education or the humanities. Basic training of coders is usually accomplished over three days with an additional 80 h of practice time necessary for coding fluency, speed and adequate reliability. More detailed description of the RIAS system including the coding manual and an annotated bibliography of RIAS studies is provided at the website 'http://www.RIAS.org'.

There are several notable limitations of the study. While we believe use of the interactive CD-ROM is an effective vehicle for video feedback and communication skills training, this study was not designed to test the effect of feedback independently of the other educational components of the programme. We are doing that in current studies.

In addition to the one-hour role play and didactic session described earlier, there were two activities carried out within the context of the simulated patient interview that may have contributed in some unmeasured way to changes in resident performance. Residents were asked to complete a communication self-assessment checklist immediately following their interview with the simulated patient. While this self-assessment was not discussed with the resident, it may have served to increase the salience of some communication behaviours that were covered during the didactic and role play session or it may have increased the resident's receptivity to the RIAS feedback. Secondly, after the resident left the room following the interview, the simulated patients spoke to the camera for several minutes giving their impression of the interview. These comments were not used as part of the training curriculum and were not discussed with the residents or included in the RIAS feedback session. We do not know if any of the residents viewed these segments, but if they did, it is possible that the comments could have affected performance in some way.

Furthermore, the study is not a randomized trial and in that regard there are methodological weaknesses.[6] The design attempted to minimize these, however. All first year residents participated in the study as it was part of the standard curriculum and therefore selection bias was lessened. The short time between baseline and the evaluative interview (three to four weeks) makes maturation a less likely confounder than is usually the case in quasi-experimental designs. Furthermore, as only very short-term effects were measured, we do not know how enduring the communication changes may be.

Finally, the statistical power for the stratified gender analysis is weak, with a substantially smaller sample of male than female residents. As a result, conclusions regarding group differences can only be made with caution and the likelihood of failing to identify areas of subtle communication change for the male sample is high because of limited power. Nevertheless, the results showing statistical significance or supporting a statistical trend are generally in line with what would be expected on the basis of the broader literature describing gender-linked communication differences.

We believe that the embedding of a code system into interactive software for feedback and review is an exciting innovation. Based on our analysis and discussion with both faculty and residents, we have continued to develop the coding platform and to experiment with additional feedback options, including the following:

- We are in the process of developing an interactive training module to facilitate use of the feedback programme to assist learners in the process of self-reflection and self- assessment. In addition to a tutorial in navigating the software, the training module will provide the didactic background of an instructional session with a variety of on-line, just in time help menus. These will provide, among other resources, a video glossary with

examples of targetted skills drawn from simulated (or actual) patient interviews, and an extensive annotated bibliography outlining the evidence base for communication skills.

- As part of the module, learners will complete a self-assessment, goal-setting process that will be linked to future performance. We would like to see the development of a communications skills portfolio to be used by learners to demonstrate mastery of skills of increasing complexity and sophistication over the years of a residency programme. The current study addressed basic skills for first year students. We would anticipate that higher order skills for advanced students might include the delivery of bad news, facilitation of family conferences, or participatory decision making in regard to such sensitive issues as enrolment in clinical trials, advance directives, and hospice care.

- We have developed a mechanism to incorporate the patient's experience during the visit into the coded record. Based on earlier work by Beckman & Frankel in which patients were asked to review and discuss seminal moments in a videotape of their visit with their resident,[9] we have explored the utility of having the simulated patient narrate a 'running subtext' when reviewing their videotape. Inasmuch as patient reactions are often limited to an internal dialogue, asking for an explicit articulation of these thoughts can provide a unique window into the patients' experiential world. To this end, simulated patients in another study were asked to review their videotapes and consider their reactions at seminal moments throughout the visit; these thoughts were added as direct notations to the coding record. These comments may be retrieved in the same manner as other coded exchanges.

We have considered having the physician add his/her own narrative review, independent of that of the simulated patient, to explore the conditions under which these 'dual monologues' of subtext continue as soliloquy or cross to contribute to a conversation. The utility of an articulated narrative was evident in a recent session during which a simulated patient was counselled for a suspected thyroid condition. The physician stated 'the good news is that your problem can be easily managed with the use of radioactive iodine' (and later reported that he felt successful in reassuring his patient). The patient nodded and said nothing in response. The physician continued with reassurances and the visit ended. The simulated patient subtext indicated a good deal of distress and read 'Radioactive?! Is my thyroid cancerous?' When this note was reviewed by the physician, he reported that it was a transforming insight providing a new perspective on patient reaction.

CONCLUSION

The process of video review is a powerful and effective teaching tool providing guidance for experiential learning and reflective self-assessment. As traditionally implemented, however, there are significant logistical and methodological issues limiting the use and effectiveness of video feedback, some of which are addressed in the described feedback approach.

An additional advantage derived from structuring feedback through a quantitative coding system is that the criteria for performance evaluation becomes transparent. Students can see exactly what elements of communication are being assessed and how these relate to their performance. This transparency can provide communication skills assessment with an important element of credibility and be used to chart achievement of educational objectives, monitoring of the progress of participants (individually or as a group), and a normative basis of comparison by which individual performance can be compared to that of the larger group. Practising physicians appear to appreciate such feedback. In a large community-based study, the promise of individualized feedback on communication performance relative to a normative peer group was cited as the primary incentive for participation in an observational study of routine medical practice.[16]

Considering that most communication skills training programmes are substantially longer than the very modest time commitment of the current study – two instructional hours and two additional hours devoted to videotaping with simulated patients – the behaviour change findings are especially noteworthy and should be encouraging to programme directors struggling to accommodate communication skills training into a busy student schedule.

CONTRIBUTORS

Study concept and design: Roter, Shinitzky, Chernoff and Larson. Acquisition of data: Shinitzky, Chernoff, Serwint and Adamo. Analysis and interpretation of data: Roter, Larson and Wissow. Drafting of the manuscript: Roter. Critical revision of the

manuscript: Roter, Larson, Shinitzky, Chernoff, Serwint, Adamo and Wissow. Statistical expertise: Roter and Wissow. Obtained funding: Shinitzky. Administrative, technical or material support: Larson, Shinitzky, Chernoff, Serwint and Adamo. Study supervision: Larson and Shinitzky.

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