

Teaching Electronic Health Record Communication Skills

Mary Val Palumbo, DNP, APRN, GNP-BC, Marie Sandoval, MD, Vicki Hart, PHD, Clarissa Drill, RN, BSN

This pilot study investigated nurse practitioner students' communication skills when utilizing the electronic health record during history taking. The nurse practitioner students ($n = 16$) were videotaped utilizing the electronic health record while taking health histories with standardized patients. The students were videotaped during two separate sessions during one semester. Two observers recorded the time spent (1) typing and talking, (2) typing only, and (3) looking at the computer without talking. Total history taking time, computer placement, and communication skills were also recorded. During the formative session, mean history taking time was 11.4 minutes, with 3.5 minutes engaged with the computer (30.6% of visit). During the evaluative session, mean history taking time was 12.4 minutes, with 2.95 minutes engaged with the computer (24% of visit). The percentage of time individuals spent changed over the two visits: typing and talking, -3.1% ($P = .3$); typing only, $+12.8\%$ ($P = .038$); and looking at the computer, -9.6% ($P = .039$). This study demonstrated that time spent engaged with the computer during a patient encounter does decrease with student practice and education. Therefore, students benefit from instruction on electronic health record-specific communication skills, and use of a simple mnemonic to reinforce this is suggested.

KEY WORDS: Communication skills, Electronic health record, Nursing education

The Health Information Technology for Economic and Clinical Health Act of 2009 provided incentives for the adoption of electronic health records (EHRs) in primary care practices. The consequent reduction in reimbursement for nonusers of the EHR was expected to produce widespread EHR usage by 2015.¹ This has presented vast implications for providers, healthcare organizations, and educators. This study investigated nurse practitioner students' (novice) communication skills during practice history taking with standardized patients when utilizing the EHR.

Author Affiliations: Department of Nursing, University of Vermont, Burlington (Dr Palumbo); Department of Medicine, University of Vermont, Burlington (Dr Sandoval); Adult Primary Care-South Burlington, Vermont (Dr Sandoval); Office of Health Promotion Research, University of Vermont, Burlington (Dr Hart); and University of Vermont Medical Center and University of Vermont College of Nursing, South Burlington (Ms Drill).

Funding was received from a Frymoyer Scholars Grant.

The authors have disclosed that they have no significant relationship with, or financial interest in, any commercial companies pertaining to this article.

Corresponding author: Mary Val Palumbo, DNP, APRN, GNP-BC, Department of Nursing, University of Vermont, 106 Carrigan Drive, Burlington, VT 05405-0068 (mpalumbo@uvm.edu).

Proponents of widespread implementation for EHR predicted enormous benefits to the care of patients, but the literature has demonstrated conflicting effects. Abelson² believed that the EHR is more legible, instantaneous, and complete, thereby allowing the provider more time to evaluate the patient. Provider-to-provider communication improvement is also cited as an important benefit of EHR use. Yet, Hanlon³ raised concerns about the EHR's effect on health record privacy, medical education, documentation, and the overall quality of outpatient office visits. A literature review by Lau et al⁴ found in 43 studies of EHR use that 51.2% showed positive impacts, 18.6% found negative impacts, while the remaining showed no effect on six areas: prescribing support, disease management, clinical documentation, work practice, preventive care, and patient-physician interaction. This led the authors to conclude that "Currently, there is limited positive EMR impact in the physician office."^(p1) More specifically, Linder et al⁵ reported the following barriers to using the EHR during patient visits: loss of eye contact with patients (62%), falling behind schedule (52%), computers being too slow (49%), inability to type quickly enough (32%), feeling that using the computer in front of the patient is rude (31%), and preferring to write long prose notes (28%).

ELECTRONIC HEALTH RECORD IMPACT ON COMMUNICATION WITH PATIENTS

It is widely acknowledged that communication is the most vital part of the provider-patient relationship. Shachak et al⁶ reported that EHR use had a negative influence on communication. Of their study participants, 92% felt that EMR use disturbed provider-patient communication but felt that this could be partially addressed by improving the spatial organization of physicians' offices and by enhancing physicians' computer and communication skills. Noordman et al⁷ compared videotapes of general practitioners (GPs) in the Netherlands who were using computers during office visits to themselves at two different time periods (2001 and 2008). This study found that the GPs used their computers less during the visits in 2008 compared to 2001. The proportion of time the GP looked at a patient and the amount of information given by GP to the patient in both years were negatively affected by the percentage of time the GP spent on the computer. There was also a negative link between the GP's computer use and his/her body posture toward the patient and the amount of information given by patients. Conversely, other researchers have found some positive effects of computer use on patient-provider

communication. For example, in a study of pediatric providers, the use of more open-ended questions was observed.⁸

Frankel et al⁹ found that effective use of computers in the outpatient exam room may depend on clinicians' baseline communication skills that are carried forward, and are amplified, positively or negatively, in their effects on clinician-patient communication. Using the EHR during an office visit certainly adds another variable to the provider-patient interaction. Unfortunately, in the experience of the authors, it seemed that the initial training prior to implementation of an EHR focused on the technical skills needed to use the EHR with the communication skills being an afterthought. Clearly, more research is needed on the impact of the EHR on patient-provider communication and strategies have been called for to overcome the perceived negative effects.^{2,10,11}

THE ELECTRONIC HEALTH RECORD AND EDUCATION OF HEALTHCARE PROVIDERS

The majority of the studies have looked at the effect of the EHR on medical student education, preceptor/clerkship impact, and educators' perceptions of change. In a literature review of 42 studies by Ellaway et al,¹² some examples of good practice and successful integration were found; however, the majority of articles reviewed raised issues and concerns with EHRs and medical education. These authors concluded that students need "deliberate instruction, guidance, and modeling from their preceptors in and around the use of electronic health record (EHRs)," and they believe that students will not develop skills through "ambient exposure or operator training alone."^(p282) They also recommended that preceptors find ways to systematically teach on and around EHRs using principles of patient-centered care. Moser et al¹³ concurred with this recommendation.

Morrow et al¹⁴ found no descriptions of EHR-specific communication skills curricula in US medical schools. The authors' randomized controlled trial, using 17 medical students, found that the students who received EHR communication skills training performed significantly better than controls in six of 10 EHR communication skills. They also demonstrated that EHR-specific communication skills were not inherent but instead needed to be taught.

With the attention of nurse practitioner and medical educators, all of these educational issues can be addressed; however, acknowledging providers' and educators' negative feelings about the EHR may be necessary. Spencer et al¹⁵ studied the effect on educators and found that nearly half of the faculty reported decreased enthusiasm for teaching following EHR implementation (48.2%). Furthermore, most (65.1%) reported that the EHR distracted from teaching, few saw its advantages, and most reported that EHR implementation led them to teach less (62.3%). Perhaps most troubling was the authors report that the most enthusiastic teachers were the ones most affected.

Clearly, new "best practices" must be developed and tested for effective and satisfying use of the EHR. At the time of this study, recommendations from Morrow et al,¹⁴ Pearce et al,¹⁶ Kaiser Permanente,¹⁷ and Frankel et al⁹ were used to instruct nurse practitioner students on the best way to integrate the EHR into the history-taking phase of the visit.

For this study, formative and evaluative sessions of nurse practitioner students interviewing standardized patients were conducted and audiotaped to provide descriptive information about the novice experience with EHR in the exam room.

Purpose

The purpose of this pilot study is to describe and quantify communication skills of nurse practitioner students during history taking with a standardized patient when a computer is used. By describing the novice experience and reviewing the literature for expert recommendations, EHR-specific communication skills can be identified.

Research Questions

1. How will nurse practitioner students perform in formative and evaluative sessions with standardized patients as measured by a 10-point EHR communication checklist adapted from Morrow et al¹⁴?
2. When an EHR is utilized in the exam room, what portion of a nurse practitioner students' history taking is spent typing and talking, typing only, and looking at the computer without talking?
3. Does this time spent change from the formative to the evaluation session in one semester?

METHODS

Approval was sought and obtained for this study from the University of Vermont Committee on Human Research. Nurse practitioner students (N = 20) in a second semester clinical course received instruction on EHR use and communication skills. Instruction was given prior to the formative practice session (February), and students were encouraged to review the instructions before the end of semester evaluation session (May). Both sessions were videotaped and utilized standardized patients with a common problem. A 10-point checklist of communication skills was completed by observers for both the formative and evaluative sessions for each student-standardized patient (SP) encounter. This checklist was adapted from a previously used checklist.¹⁴

In addition, the ODLog software (Macropod Pty Ltd, Victoria, Australia) was used by two observers to record student time spent: typing and talking, typing only, and looking at the computer without talking. ODLog is a software application for accurate timing and recording of observational data. Of the 20 students enrolled in the course, 15 student videos were recorded and available for analysis of the formative session and 16 for the evaluative session. The missing

Table 1. 10-Point Checklist for EHR Communication Skills

EHR Communication Skills	Done on Formative Session (February 2012)	Done on Evaluation Session (May 2012)
1. Introduce self/role to patient	100%	100%
2. Uses open-ended questions and gives adequate time for answers	92.5%	100%
3. Wash hand prior to SP contact	95%	85.7%
4. Attend to modesty and comfort	92.5%	100%
5. Educate patient about computer use	77.5%	95%
6. Positions computer so patient can see screen	62.5%	85.7%
7. Explains/summarizes long periods of typing	70%	95%
8. Maintains good eye contact	85%	100%
9. Establishes a supportive and concerned rapport	100%	95%
10. Closes/summarizes visit appropriately	85%	81%

tapes were due to computer connection problems experienced on the formative session. All students were paired with themselves for comparison, as well as whole-group comparisons. Comparisons between the formative and evaluative sessions were made using paired *t* tests after checking for normality assumptions. Total time of history taking and placement of the computer was recorded. Observers were trained for use of ODLog when viewing videotapes, and interrater reliability was .84.

FINDINGS

In the formative session, all of the students (100%) introduced themselves and established rapport; 95% washed their hands after computer use, 92.5% asked open-ended questions and attended to modesty and comfort, 85% kept good eye contact and closed the visit appropriately, 77.5% educated the patient about the EHR and computer use, 70% explained long periods of typing, and 62.5% positioned the computer so the patient could see it. Table 1 shows that there was a positive change in the EHR-specific communication skills from the formative to the evaluative session.

In the formative session, mean history taking time was 11.4 minutes. Of this time, a total of 3.5 minutes was spent typing and talking (45.9 seconds; 7%), typing only (125.1 seconds; 18%), and looking at the computer and not talking (37.3 seconds; 5%), for 30.6% of this session. In the evaluative session, mean history taking time was 12.4 minutes. Of this time, a total of 2.95 minutes was spent typing and talking (31.9 seconds; 4%), typing only (124.7 seconds; 17%), and looking at the computer not talking (20.9 seconds; 3%), for 24% of this session. A slight difference was noted between mean group times (52.5 seconds; $P = .3$; 95% confidence interval [CI], 52.0–156.9 seconds). The percentage of time spent by individual students changed over the two sessions: typing and talking, -3.1% ($P = .3$; 95% CI, -9.7% to 3.5%); typing only, $+12.8\%$ ($P = .038$; 95% CI, 0.8% – 24.6%); and looking at the computer and not talking, -9.6% ($P = .039$; 95% CI, -18% to

0.5%). Figure 1 provides a link to a video example of one student's formative and evaluative sessions.

DISCUSSION

Attention must be paid to EHR-specific communication skills in nurse practitioner education and medical school curricula as these skills are not inherent and require specific instruction and practice.¹⁴ In the second semester of their program, the nurse practitioner students performed well on their basic communication with patients, as evidenced by the observer ratings of these skills (Table 1). However, even after students were instructed to do this, the EHR-specific communication skills of educating the patient about the computer, explaining long periods of typing, and positioning the computer correctly were not intuitive for all students.

A change in individual student time spent engaged with the computer (increased time typing only and decreased time looking only) was seen on the evaluative session. When looking specifically at the time the novice spends engaged with the computer rather than directly with the patient, this study found it to be a considerable portion of the history taking (30% in the formative session and 24% in the evaluative session). In a study done by Margalit et al,¹⁸ physicians spent 24% to 42% of the total visit staring at the computer, and intense typing was evident in 24% of studied visits. This brings into question the idea that the experienced provider in primary care is the “expert” in EHR communication skills and further supports the idea that “Best Practices” must be developed and taught.



FIGURE 1. Scan here to view a video example of a student in the formative phase (February) and in the evaluative phase (May).

RESPECTS© Mnemonic

- **Review** the EHR before entering room – be as prepared as possible before entering the room as this reduces distraction.
- **Entrance** – make sure to introduce yourself and clarify that the patient is the priority of the visit before any EHR use in the room.
- **Say** what you are doing – Verbally describe all EHR actions, so the patient is aware of what is happening.
- **Position** of computer – Make sure that the patient can see the computer screen by creating a patient-provider-computer triad.
- **Engagement** position - Face the patient with your whole body, not just your head when communicating. The computer can be easily pushed aside if needed.
- **Computer** is a valuable tool – have confidence in the EHR and demonstrate this to your patient as it gives them confidence in you and the EHR.
- **Teach** – educate the patient with the EHR resources and patient's own data.
- **Summarize and Sign out** – review and provide a written summary for your patient. Sign out so no one else can log on under your name.

FIGURE 2. RESPECTS mnemonic. Reprinted with author permission.

The student must first learn to navigate the program in order to enter information in the appropriate place. A significant decrease in the time spent staring at the computer in the evaluation session confirmed that this is a skill that improves with practice. Being able to tell the patient what the provider is doing when typing (“I’m entering your description of the problem”) or just looking at the computer (“I’m looking for your lab results from 1 year ago”) is an important educational technique. The EHR has tremendous potential as a patient education tool, and nurse practitioner students need to be oriented on how to take advantage of this potential.

LIMITATIONS

The findings of this pilot study are limited by the small convenience sample; therefore, further research examining communication skills while using the EHR for both novice students and experienced providers is recommended. With a larger study, demographic information about the students might be useful to identify any age- or culture-related communication advantages or barriers when the EHR is brought into the exam room. Previous computer experience, keyboard proficiency, and perceptions of computer skill were not collected and might add to a broader understanding how to individualize teaching methods. Having controls for the variations in history taking time with different standardized patient problems might also be helpful. Another limitation of this pilot study was the lack of a comparison group of students who were not given instruction regarding communication during use of the EHR for history taking. Finally,

the researchers were not blinded to condition (formative, evaluative), so there is potential bias in measures.

RECOMMENDATIONS/CONCLUSIONS

On the basis of the findings of this study and of input from the literature review, nurse practitioners, and medical students and their preceptors, the authors developed the following RESPECTS mnemonic to introduce EHR-specific communication skills into curricula in an efficient, memorable fashion (Figure 2).^{19,20}

A teaching video was also created for nurse practitioners and medical students explaining the RESPECTS technique and is now available. By recognizing that the computer is now going to be another tool that providers can utilize in the exam room, educators will need to give their students adequate instruction for its use. Rich and Day²¹ speculated that the computer will be integrated into the exam room environment more creatively in years to come. But for now, students and faculty must focus on the EHR-specific communication skills that will enable establishing the important patient-provider relationship necessary for quality healthcare.²²

Acknowledgment

The authors thank the University of Vermont Graduate Nursing students.

References

1. Klein CA. Electronic health records 101. *Nurse Pract.* 2011;36(1): 15–18.
2. Abelson TI. The electronic medical record: learning to swim. *Cleve Clin J Med.* 2010;77(7): 415–419.
3. Hanlon JT. The electronic medical record: diving into a shallow pool? *Cleve Clin J Med.* 2010;77(7): 408–411.

4. Lau F, Price M, Boyd J, Partridge C, Bell H, Raworth R. Impact of electronic medical record on physician practice in office settings: a systematic review. *BMC Med Inform Decis Mak*. 2012;12: 10.
5. Linder JA, Schnipper JL, Tsurikova R, Melnikas AJ, Volk LA, Middleton B. Barriers to electronic health record use during patient visits. *AMIA Annu Symp Proc*. 2006: 499–503.
6. Shachak A, Hadas-Dayagi M, Ziv A, Reis S. Primary care physicians' use of an electronic medical record system: a cognitive task analysis. *J Gen Intern Med*. 2009;24(3): 341–348.
7. Noordman J, Verhaak P, van Beljouw I, van Dulmen S. Consulting room computers and their effect on general practitioner-patient communication. *Fam Pract*. 2010;27(6): 644–651.
8. Johnson KB, Serwint JR, Fagan LA, Thompson RE, Wilson ME, Roter D. Computer-based documentation: effects on parent-provider communication during pediatric health maintenance encounters. *Pediatrics*. 2008;122(3): 590–598.
9. Frankel R, Altschuler A, George S, et al. Effects of exam-room computing on clinician-patient communication: a longitudinal qualitative study. *J Gen Intern Med*. 2005;20(8): 677–682.
10. Hsu J. Reply to "Health information technology and physician-patient interactions: impact of computers on communication during outpatient primary care visits". *J Am Med Inform Assoc*. 2006;13(2): 237–237.
11. Lown BA, Rodríguez D. Commentary: lost in translation? How electronic health records structure communication, relationships, and meaning. *Acad Med*. 2012;87(4): 392–394.
12. Ellaway RH, Graves L, Greene PS. Medical education in an electronic health record-mediated world. *Med Teach*. 2013;35(4): 282–286.
13. Moser SE, Warren D, Kelleman R. Precepting medical students in the era of EHRs. *Fam Med*. 2010;42(2): 89–90.
14. Morrow JB, Dobbie AE, Jenkins C, Long R, Mihalic A, Wagner J. First-year medical students can demonstrate EHR-specific communication skills: a control-group study. *Fam Med*. 2009;41(1): 28–33.
15. Spencer DC, Choi D, English C, Girard D. The effects of electronic health record implementation on medical student educators. *Teach Learn Med*. 2012;24(2): 106–110.
16. Pearce C, Arnold M, Phillips C, Trumble S, Dwan K. The patient and the computer in the primary care consultation. *J Am Med Inform Assoc*. 2011;18(2): 138–142.
17. Kaiser Permanente. Physician exam room EHR etiquette. 2011. <https://www.youtube.com/watch?v=LZAqJtpzEY>. Accessed March 12, 2016
18. Margalit RS, Roter D, Dunevant MA, Larson S, Reis S. Electronic medical record use and physician-patient communication: an observational study of Israeli primary care encounters. *Patient Educ Couns*. 2006;61(1): 134–141.
19. Palumbo MV, Sandoval M. Novice to expert communication skills using the electronic health record during history taking. Paper presented at: 2013 International Conference on Communication in Healthcare; 2013; Montréal, Canada.
20. Sandoval M, Palumbo MV. What is the effect of the electronic health record on the outpatient office visit and student education? Paper presented at: 2014 Improving Primary Care Through Industrial and Systems Engineering (IPRACTISE) Invitational Conference; 2014; Madison, VT.
21. Rich CR, Day TD. Integrating electronic health records in the physical environment: a systems approach. *HERD*. 2008;2(1): 48–65.
22. Ventres WB, Frankel RM. Patient-centered care and electronic health records: it's still about the relationship. *Fam Med*. 2010;42(5): 364–366.

For more than 50 additional continuing education articles related to Nursing Informatics, go to NursingCenter.com/CE

Instructions for Taking the **CE Test Online** Teaching Electronic Health Record Communication Skills

- Read the article. The test for this CE activity can be taken online at www.nursingcenter.com/ce/CIN. Tests can no longer be mailed or faxed.
- You will need to create a free login to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Williams & Wilkins online CE activities for you.
- There is only one correct answer for each question. A passing score for this test is 13 correct answers. If you pass, you can print your certificate of earned contact hours and the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Williams & Wilkins: 1-800-787-8985.

Registration Deadline: June 30, 2018

Disclosure Statement:

The authors and planners have disclosed that they have no financial relationships related to this article.

Provider Accreditation:

Lippincott Williams & Wilkins, publisher of *CIN, Computers Informatics Nursing*, will award 2.0 contact hours for this continuing nursing education activity.

Lippincott Williams & Wilkins is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 2.0 contact hours. Lippincott Williams & Wilkins is also an approved provider of continuing nursing education by the District of Columbia and Florida CE Broker #50-1223. Your certificate is valid in all states.

Payment:

- The registration fee for this test is \$21.95.