



Precepting Medical Students in the Patient's Presence: An Educational Randomized Trial in Family Medicine Clinic

David V. Power, MB, MPH; Marcy E. Rosenbaum, PhD; Lindsey Hanson, MD, MPH;
Ian R. Reynolds, MD; Darin Brink, MD; Shailendra Prasad, MBBS, MPH; Clarence D. Kreiter, PhD

BACKGROUND AND OBJECTIVES: Many medical student-patient encounters occur in the outpatient setting. Conference room staffing (CRS) of student presentations has been the norm in the United States in recent decades. However, this method may not be suitable for outpatient precepting, being inefficient and reducing valuable direct face time between physician and patient. Precepting in the Presence of the Patient (PIPP) has previously been found to be an effective educational model in the outpatient setting but has never been studied in family medicine clinics, nor with non-English speaking patients, nor patients from lower socioeconomic backgrounds with low literacy.

METHODS: We used a randomized controlled trial of educational models comparing time spent using PIPP with CRS in two family medicine clinics. Patient, student, and physician satisfaction were also measured using a 5-point Likert scale; total encounter time and time spent precepting were also recorded.

RESULTS: PIPP is strongly preferred by attending physicians while patients and students were equally satisfied with either precepting method. PIPP provides an additional 3 minutes of physician-patient face time (17.39 versus 14.08 minutes) in an encounter that is overall shortened by 2 minutes (17.39 versus 19.71 minutes).

CONCLUSIONS: PIPP is an effective method for precepting medical students in family medicine clinics, even with non-English speaking patients and those with low literacy. Given the time constraints of family physicians, PIPP should be considered as a preferred, time-efficient method for training medical students that is well received by patients, students, and particularly by physicians.

(Fam Med 2017;49(2):97-105.)

Osler famously urged medical educators that there should be “no teaching without a patient for a text, and the best teaching is that taught by the patient himself.”¹ However, recently, the most common method of precepting

medical learners in the United States is to have the learner present the details of the history and physical exam they obtained from a patient in a location away from the patient—often known as conference room staffing (CRS).² An alternate

approach has been described of having the learner present these details to the preceptor in the patient's presence (variously known as Teaching in the Presence of the Patient, Patient Witnessed Precepting or, in the inpatient setting, Bedside Teaching or Patient and Family Centered Rounding).²⁻⁵ Here, we use the term Precepting in the Presence of the Patient (PIPP), which we think more accurately describes the nature of the encounter.

The purpose of this project is to investigate the feasibility of physicians using PIPP when working with medical students in family medicine clinics and compare it to conventional CRS. There have been a number of previously published studies comparing a version of PIPP to outpatient CRS,⁶⁻⁹ including three randomized controlled trials (RCTs).¹⁰⁻¹² In particular, the prior RCTs lay an

From the Department of Family Medicine and Community Health, University of Minnesota Medical School (Dr Power); Department of Family Medicine and Office of Consultation and Research in Medical Education, University of Iowa (Drs Rosenbaum and Kreiter); Sioux Falls Family Medicine Residency Program (Dr Hanson) (at the time of the study: Lindsey Johansen, Student, University of Minnesota Medical School); Department of Internal Medicine Residency Program, University of Colorado at Denver (Dr Reynolds) (at the time of the study: Student, University of Minnesota Medical School); Department of Family Medicine and Community Health, University of Minnesota (Drs Brink and Prasad).

important foundation for the current project. The oldest RCT, conducted by Anderson and colleagues, compared the use of PIPP versus CRS by faculty working with residents seeing patients in a general medicine outpatient clinic.¹⁰ Findings in this study served to address commonly cited concerns that PIPP may decrease patient, faculty, and/or learner satisfaction. While there were no significant differences in overall patient satisfaction, patients reported that listening to their case being discussed during PIPP made them feel more comfortable, and they indicated a significant preference for use of PIPP in future visits. Residents perceived no differences in attending physicians' teaching points, diagnosis, and therapy recommendations between the two conditions. While all attending physicians were comfortable using PIPP, 10% of residents in this study expressed discomfort at discussing the patient in the examination room.

The RCT conducted by Petersen and colleagues extended previous work by including a wider range of learners (residents, fellows, and students) in more varied settings (outpatient general medicine, rheumatology, and pulmonology) and more in-depth assessment of participant perceptions as well as measuring the time used in each condition.¹¹ Results demonstrated that while use of PIPP resulted in increased actual time attending physicians spent with the patient, there was no significant difference in mean total staffing time between either condition. Patient perception findings in this study were similar to the previous RCT indicating overall patient comfort with PIPP, no significant difference in satisfaction between PIPP and CRS, and a preference for visits using PIPP in the future. Learner perceptions were also overall positive with learner comfort and preference for PIPP increasing with more exposure to PIPP. There were no significant differences in learner perceptions of autonomy, supervision, ability to ask questions, adequate

time for teaching, patient discomfort, or fear of performing poorly between the two conditions. While not compared to learner perceptions as in the previous study, Peterson et al did find that faculty preferred using PIPP on all counts as better for teaching, learning, patient care and time efficiency, regardless of learner level or type of visit. A concern previously expressed about PIPP is whether this method is appropriate to use with all patients and with all complaints.^{5,7,10} For example, should PIPP be used when discussing sensitive issues such as those related to mental health?^{4,11} To examine the feasibility of using PIPP with patients with mental health concerns, Madson et al conducted an RCT in an outpatient psychiatry clinic with resident learners using similar measures to Petersen.¹² Mirroring previous findings, patients being seen in this clinic were comfortable with PIPP, reported high satisfaction with both PIPP and CRS but a higher satisfaction with PIPP particularly amount of time they perceived was being spent with them and a preference for visits using PIPP in the future. More specific to the concern whether PIPP can be used with this patient population, patients indicated not feeling confused or embarrassed in having their condition discussed in front of them and felt that they were contributing to learner education in both conditions. Though faculty did not express a significant preference for PIPP, faculty were comfortable using this model and perceived that patients benefited from and were comfortable with PIPP. Similarly, residents were overall satisfied and comfortable with the use of PIPP and there were no significant differences in learner ratings between conditions except learners perceiving the need to choose their words more carefully in PIPP. The current RCT compares PIPP and CRS with medical students as learners in family medicine clinics caring for significant numbers of patients with lower socioeconomic and literacy levels as well as non-English

speaking patients who require an interpreter. Thus, the current study investigates the applicability of PIPP to a clinical setting, learners, and patients who have not been included in any significant numbers in previous studies.

Methods

We adapted methodology used in two previous RCTs conducted by one of the authors (MR).^{11,12} We randomized participating patients to PIPP or CRS, and patient, student, and faculty response questionnaires were filled out at the completion of each visit. Once the student had completed their history and physical examination, we recorded time measurements until the end of each encounter. At the end of the 4-week study, we conducted individual interviews and focus groups with participating students, interpreters, and faculty to provide additional feedback.

Settings and Participants

The study proposal was considered exempt by the Institutional Review Board of the University of Minnesota. The study was conducted at two University of Minnesota Family Medicine residency clinics concurrently: Bethesda Clinic, St Paul and Broadway Family Medicine Clinic, Minneapolis. Data collection occurred during a 4-week period in February 2013. We chose these sites because they had a patient population of predominantly low socioeconomic status and about 25% of clinic visits requiring interpreters. All 20 family medicine faculty physicians at both sites see patients in clinic and typically on any given half-day, two or three per site have medical students assigned to work with them. Prior to study implementation, we invited faculty members to attend a voluntary 1-hour presentation about the study at each site. Overall, 16 (80%) of physician faculty attended; we apprised the remaining faculty individually of the study purpose and logistics, and all faculty consented to participate.

We invited all the third- or fourth-year medical students who were placed at both clinics during the study period to participate. This included seven University of Minnesota students, and all agreed to participate. A total of four were completing their required 4-week Family Medicine Clerkship; two were participating in a 9-month longitudinal integrated clerkship at one site, and one was in a 12-week clerkship at the other site. We deliberately started and ended the study midway through the 4-week clerkship to be able to include the two students finishing their last 2 weeks at both sites and the two students who started the next clerkship period.

Patient candidates were all patients assigned to a faculty-learner pairing during a given clinic half-day. There were no exclusions, and interpreted visits were welcomed. Patients seen more than once within the study period were allowed to participate on each separate occasion. We excluded encounters where medical students worked with residents from the study because of the complexity resulting from also precepting these visits with faculty. We also excluded faculty-learner pairings that included a first- or second-year medical student given that these students typically would not perform a full interview or exam with patients. Faculty and learners were allowed to break randomization at any time if they felt this was clinically warranted.

Randomization and Interventions

Once the patient was roomed by a medical assistant, a research assistant (RA) entered the room, briefly explained the study, and asked if the patient was willing to (1) be seen by a medical student and (2) participate in the study. If consent was obtained, the patient received further verbal and written information regarding the study, including that they could opt out at any time. The medical student then entered the room and performed an initial history and physical examination,

as per clerkship expectations. Upon leaving the room, each patient encounter was then randomized to either have the learner make the case presentation to their preceptor in the patient's presence in the exam room (PIPP) or in an outside conference area (CRS). Randomization occurred via a random number generator.

Outcome Data

If randomization was to CRS, we measured time from the moment the learner began presenting to the faculty member and continued to record time when faculty and learner re-entered the room up until the end of the encounter when faculty left the room. If randomization was to PIPP, we timed the encounter from the moment the faculty-learner pair entered the patient room together until the end of the encounter. The actual proportion of time spent in PIPP inside the exam room was not directly measured because we considered that having an RA in the exam room would be intrusive and could distract from patient care.

Following each individual clinic visit, we asked the patient, student, and faculty to complete a brief survey. The patient survey obtained patient demographics, self-perceived quality of health, why they had come to clinic, an estimate of the amount of time they had spent with their physician, their overall satisfaction with the visit using a 5-point Likert scale, and preferences for future visits in regards to medical student involvement. Visits that required an interpreter had a similar survey, which the interpreter helped the patient complete. Patients could elect to have the RA read the survey to them if they preferred.

Learner surveys used a Likert scale, assessing their comfort level during the visit, perceived quality of teaching, and their preferences for future visits. Faculty surveys inquired whether this had been a new or established patient, whether the visit addressed acute or chronic issues or both, to rate the overall complexity of visit as low, intermediate

or high and how much time was spent with the patient. Faculty also rated their impression of the efficiency of the visit, whether the location affected their ability to teach, and their preferred precepting location for future visits. Following the study's conclusion, faculty, learner, and interpreters were surveyed to assess the overall effectiveness of PIPP versus CRS via a Likert scale and to provide additional comments.

We entered the above data into REDCap, an online database that linked the patient, learner, and faculty surveys to the patient's randomly assigned number, along with the precepting and total encounter times.

Analysis of Interview Data

At study completion, we conducted anonymous, individual short interviews with a convenience sample of faculty (n=5), learners (n=6), and interpreters (n=2). We additionally conducted two faculty focus groups at each location. Each of the interviews was transcribed by an outside source not affiliated with the study. We coded and organized the qualitative data using NVivo 9 software (QSR International Pty Ltd. Version 9, 2010) into main themes and sub-themes.

Statistical Analysis

We analyzed the data using SAS v9.3 statistical software. We used a simple *t* test to compare the amount of time spent in the two conditions. We calculated parametric and nonparametric descriptive statistics presented in tabular and graphic formats. We used nonparametric equivalents (eg, Wilcoxon rank sum) to the parametric *t* test to confirm each significant *t* test finding for all Likert questions showing a difference in the two conditions. We evaluated each statistically significant finding ($\alpha < .05$) with a two-way analysis of variance (ANOVA) to examine several potential interactions that might impact the differences between the two groups.

Results

A total of 209 patient encounters were included in the study. One patient subsequently declined to participate, four left the clinic before completing a survey, and three surveys were not analyzed because of missing data. Thus, there were complete data on 201 patient encounters, randomized to the exam room (n=102) or conference room (n=99). Once assigned, randomization was not broken by a provider in any encounter.

Baseline Characteristics and Study Groups

Table 1 summarizes the baseline characteristics of patient participants by randomization group. Of note, one in five of the clinic encounters required an interpreter, over one third had not finished high school, only one quarter were employed, about one third had Medicare, and over one third were Medicaid insured, and over 35% considered their health poor or fair. Randomization for the study was effective related to demographic variables assessed, and each patient group had a similar distribution range of descriptive characteristics.

Patient Responses

Patient survey responses are displayed in Table 2. Overall, patients in both groups were highly satisfied with their encounters with no statistically significant differences between groups. Patients in both groups felt that they had spent adequate time with their physician and that they were able to meaningfully participate in the education of the learner. Patients randomized to PIPP did not feel embarrassed by having the faculty-learner pairing discuss their health concerns in their presence. Because PIPP involves medical discussions in front of patients, not surprisingly, patients randomized to PIPP did feel more confused by medical terminology used in their presence at a statistically significant level ($P=.04$). No clear preference

Table 1: Baseline Patient Demographic Data and Clinical Characteristics for Each Group

Variable	Exam Room (n=102)	Conference Room (n=99)
Patient age, years (SD)	45.7 (21.9%)	44.7 (21.1%)
Sex, female	63 (64.2%)	58 (59.8%)
Use of interpreter	19 (18.5%)	19 (19.2%)
Self-assigned ethnicity		
White	33 (33.3%)	34 (35.1%)
African American	34 (34.3%)	31 (32.0%)
Burmese/Karen	10 (10.1%)	11 (11.3%)
Hmong	14 (14.1%)	13 (13.4%)
Hispanic	3	4
Native American	2	0
Asian American	2	2
Other	1	2
Education		
Did not finish high school	31 (34.4%)	29 (33.0%)
High school	43 (47.8%)	42 (47.7%)
College	12 (13.3%)	10 (11.4%)
Postgraduate	4 (4.4%)	7 (8.0%)
Employment		
Student	7 (7.6%)	19 (20.7%)
Unemployed	18 (19.6%)	18 (19.6%)
Employed	25 (27.2%)	26 (28.3%)
Retired	18 (19.6%)	13 (14.1%)
Disabled	24 (26.1%)	16 (17.4%)
Insurance		
Private/HMO	21 (26.3%)	23 (28.1%)
Medicare	25 (31.3%)	27 (33.0%)
Medicaid	34 (42.5%)	31 (38.8%)
Self-pay	0	1
Perceived overall health		
Poor	8 (8.3%)	5 (5.2%)
Fair	27 (27.8%)	32 (33.0%)
Good	36 (37.1%)	34 (35.1%)
Very Good	18 (18.6%)	18 (18.6%)
Excellent	8 (8.3%)	8 (8.3%)
Reason for visit		
Acute condition(s)	34 (33.7%)	36 (38.7%)
Chronic condition(s)	46 (45.5%)	42 (45.2%)
Other	21 (28.8%)	15 (16.1%)

Table 2: Responses to Surveys Administered Immediately After Encounter

A. Patient	Location of Learner Presentation			P Value
	Patient's Presence M (SD)*	Conference Room M (SD)		
"Overall I was satisfied with today's visit."	4.47 (1.04)**	4.56 (0.77)**		.50
"I spent adequate time with my doctor."	4.33 (1.05)	4.39 (0.82)		.64
"I felt involved in the student's medical education."	4.20 (1.08)	4.19 (1.03)		.91
"I was uncomfortable with the student and doctor discussing my health problems in my presence."	2.07 (1.44)	1.89 (1.37)		.38
"There was too much 'down time' during the visit."	2.27 (1.46)	2.29 (1.28)		.91
"I was confused by medical terms used during visit."	2.07 (1.55)	1.67 (1.14)		.04***
Preference for location of learner presentation during future visits	3.61 (1.26)	3.48 (1.19)		.47
B. Faculty	Location of Learner Presentation			Effect Size
	Patient's Presence M (SD)*	Conference Room M (SD)	P Value	
Learner's understanding of patient's condition was enhanced by location.	4.29 (0.76)**	3.44 (1.00)	<.0001***	0.97
Location of staffing allowed me to teach what I wanted to teach.	4.43 (0.79)	3.98 (1.00)	<.0005***	0.5
Location of staffing assisted in the conduct of the visit.	4.53 (0.68)	3.23 (1.12)	<.0001***	1.44
If staffing occurred in patient's presence:				
I was comfortable staffing with the student in this location	4.93 (0.26)			
I was not embarrassed by lack of knowledge in patients' presence	4.98 (0.14)			
C. Learner	Location of Learner Presentation			P Value
	Patient's Presence M (SD)*	Conference Room M (SD)		
I had adequate autonomy regarding care of the patient during this visit.	4.56 (0.59)**	4.54 (0.61)		.83
I had adequate supervision by my attending physician.	4.49 (0.62)	4.46 (0.64)		.82
There was adequate time for teaching and instruction for my learning benefit.	4.41 (0.72)	4.50 (0.68)		.38
I was able to ask questions or clarify any uncertainties with my attending.	4.34 (0.80)	4.65 (0.58)		.002***
I was afraid of performing poorly or showing lack of knowledge in patient's presence.	1.60 (0.73)	1.34 (0.48)		.003***
I had to edit or choose my words carefully.	1.76 (0.98)	1.30 (0.56)		<.0001***
If staffing occurred in patient's presence:				
I found it uncomfortable staffing in patient's presence due to diagnosis	1.59 (1.02)			
I would have preferred to staff in conference room	1.86 (1.14)			

* Mean (standard deviation), ** Likert scale where 1=Strongly Disagree and 5=Strongly Agree, *** Statistically significant at $P < .05$

was found in either group for participating in PIPP versus CRS at a future visit.

Faculty Responses

While 15 faculty members participated in the study, not all responded to each question. All were family physicians. Six reported less than 5 years and seven greater than 15 years teaching experience. One had never used PIPP previously, eight reported using it less than 25% of the time, three had used it 26%–50% while two had previously used PIPP almost all of the time. Faculty responses to post-encounter survey items are listed in Table 2. There were several statistically significant differences favoring PIPP over CRS, all of which had strong effect sizes. Faculty felt that the learners' understanding of the patient's condition and its management were greatly enhanced by PIPP ($P=.0001$, effect size=0.97) and that PIPP significantly enabled them to teach what they wanted during a particular encounter. The greatest difference, however, was that faculty reported that PIPP assisted in the conduct and efficiency of the clinic visit compared to CRS.

Almost all agreed that they felt comfortable staffing with PIPP and had not been embarrassed during the student presentation.

Learner Responses

In addition to learner surveys collected immediately following patient encounters, all learners completed global surveys at the end of the study period. Six of the learners were third year and one was a fourth-year medical student; four were male and three were female. In general, students had little prior experience with PIPP: two had never used it, four estimated prior experience less than 10% of the time, while one estimated approximately 10%–25% prior experience. Learner responses to post-encounter survey items are listed in Table 2. Overall, learners in both groups strongly agreed that they had adequate autonomy in providing patient care during the visit and that supervision by the faculty member was adequate. Learners also strongly agreed that there was sufficient time for teaching and instruction for their benefit in both settings.

The majority of learners did not feel uncomfortable with PIPP due to the patient's diagnosis nor would they have preferred to staff the patient with CRS. While overall learners liked both methods, there was a statistically significant difference on three measures: learners randomized to PIPP felt less able to ask questions and clarify uncertainties, were afraid of performing poorly or showing lack of knowledge in front of the patient, and were more likely to edit or choose words carefully compared to CRS.

Time

Time data were gathered from five sources and are presented in Table 3. The total time was shorter by over 2 minutes per visit when staffed using PIPP (17.39 versus 19.71 minutes) which approaches statistical significance at $P=.09$. The average time spent precepting using CRS was 5.63 minutes. On average, there was over 3 minutes more direct contact time between physician and patient (and student) when using PIPP ($P=.01$). Faculty estimated the average time spent precepting to be roughly equivalent between groups.

Table 3: Actual and Estimated Time Spent in PIPP Versus CRS

	Location of Learner Presentation		P Value
	Patient's Presence M (SD)*	Conference Room M (SD)	
Total time from start of staffing until end of encounter (minutes)	17.39 (9.94)	19.71 (9.48)	.09
Actual time spent with learner, preceptor, and patient in exam room (minutes)	17.39 (9.94)	14.08 (8.14)	.01
Actual time spent precepting (minutes)	Not Measured	5.63 (3.11)	N/A
Patient perception of time spent with their doctor(s) (minutes)	37.55** (35.50)	31.50 (21.47)	.21
Faculty estimation of time spent with learner staffing patient (minutes)	1.96*** (0.84)	1.84 (0.89)	.31

* Mean (standard deviation)

** Perceived time spent with doctor expressed in minutes

*** Using a Likert scale where 1=<5 minutes, 2=5–10 minutes, 3=11–15 minutes, 4=16–20 minutes, 5=21–30 minutes, 6=31–45 minutes, 7=46–60 minutes and 8=>60 minutes

Patients randomized to PIPP were more likely to overestimate the time spent with their physician compared to CRS, although this difference was not statistically significant ($P=.21$).

Variable Analysis

We analyzed a number of variables between the two conditions including patient age, visit type, employment status, insurance coverage, ethnicity, use of an interpreter, overall patient self-health estimation, visit complexity, chief complaint, or whether the patient was seeing their regular physician. In no case did we detect outcome trends that were significantly different in any of the above groupings.

Interview Data

Analysis of interview responses provided additional insight into learner and faculty survey responses. Sample comments, which address study participants' perspectives on the areas of significant difference between PIPP and CRS, are presented in Table 4.

Discussion

This study explored how PIPP compares with CRS in two busy primary care clinics with medical student learners. As in previous RCTs,¹⁰⁻¹² patients and learners were equally satisfied with PIPP and CRS. However, attendings in this study expressed a very strong preference for PIPP, reporting that it greatly improved the conduct of the visit and was a far better location for precepting the student. In fact, attendings perceived no negatives with PIPP. This is a much more positive faculty perception of PIPP than previously reported,¹⁰⁻¹² suggesting that PIPP may be particularly suited to use by primary care physicians who work with medical students.

This is the third educational RCT to document the time benefits of PIPP.^{10,11} There was an additional 3 minutes of direct contact time between physician and patient using PIPP. Moreover, patients perceived spending on average 6 more minutes

with their physician using this method despite PIPP encounters being shorter by over 2 minutes compared to CRS encounters. This means that a precepting physician who sees at least 20 patients per day who uses PIPP instead of CRS will spend an additional 60 minutes in direct contact with patients and save at least 40 minutes per day. Given that it is reported that precepting a medical student adds on average 1.23 hours to the workday for a physician, PIPP can significantly reduce the added time burden.¹³

The fact that PIPP performed well with a population where one fifth of patients used interpreters, and one third were of low socioeconomic status and low literacy further dispels concerns about the applicability of PIPP.^{5,7,10} Our study confirms that PIPP can be used in a variety of settings with a broad range of patients and that true contraindications to PIPP are rare.

This study is the first RCT to examine PIPP exclusively with medical students as learners in family medicine clinic, and findings are generally similar to those of prior RCTs where residents in internal medicine clinics are comfortable using PIPP. The observation by students that "I had to edit or choose my words carefully" when using PIPP at first blush appears to be a limitation of the method. However, on further consideration, this may indeed prove to be another benefit of the method in that it encourages the student to be more deliberate about using appropriate, respectful, and health literate language with each patient: something that family medicine, in particular, values. In this era of increased attention to the health literacy of graduating physicians, this is particularly important.

That both teachers and learners considered that PIPP limited the opportunities for learner questions and explanation of "clinical reasoning and discussion of complex medical issues" is a significant limitation of PIPP that must be addressed in other ways. Reasons for this included

not wanting to confuse or distress the patient nor to embarrass the learner—and these are legitimate reasons to avoid such conversations when using PIPP. It is therefore imperative that preceptors who use PIPP with their learners must take time to address learner questions and provide supplemental student education, including discussion of more complex patient care issues, outside of the exam room, such as at the end of a clinic session. Indeed, preceptor and student briefly reviewing each of the patients seen using PIPP also allows the opportunity for the student to add any observations or concerns that they had had but that were not appropriate to share in front of the patient. This will also allow the preceptor to include important observations in the documentation of the visit. We acknowledge that such "outside clinic room" conversations were not measured in this study and will diminish the time savings of PIPP. Because patient, physician, and learner have opportunities to verify the accuracy of the history obtained by the student, a possible emerging benefit of PIPP is that it is more in compliance with national medical student documentation guidelines than CRS. This potential needs further exploration.

There are several limitations to our study. Our sample of students was relatively small. However, the large number of encounters helps to balance this limitation. We lack data on the total number of patients who declined to participate (although anecdotal reports from the research assistants was that this number was very low). We allowed patients to participate more than once if they had repeat visits during the study period but did not document how often that occurred. It would have been preferable to measure the actual time in minutes spent precepting in the exam room rather than select a range of time. Additional research on precepting in the exam room is needed to more fully understand the impact this method can

Table 4: Sample Comments From Interview Data

Sample Faculty Responses	
Enabling them to teach and enhance learner understanding	<ul style="list-style-type: none"> • For the learner it was probably better teaching in the room. I think with the patient there, it was a little bit more comprehensive, little more in depth,... I may take a little more time to explain it to a patient. • The patient is more involved in decision making and the thought process [with PIPP], which is good for patients and certainly good for students because that's a big part of family medicine. [With PIPP], I was less aggressive about questioning the student than I would be outside of the room because I was fearful I would make the student look bad by not knowing something.
Efficiency	<ul style="list-style-type: none"> • I think it's a very efficient method for maintaining the focus on the patient throughout. Time wise, there's less "down" time, they're kind of constantly being attended to and get out of the clinic in a better length of time... • With the precepting in the room I actually felt that the communication was more efficient because when I [use CRS] I always feel some obligation to reiterate the history [when I re-enter the room] so it is clear to the patient that I was [given] the appropriate information [by the student].
Comfort with/preference for PIPP	<ul style="list-style-type: none"> • Before now, I never precepted in the room. Now I prefer it, I think it's more efficient. • I've grown to like precepting in the room more. I think there's an opportunity to work not only on the content of a visit itself, but communication skills can be evaluated and modeled differently and you can have better assessment of students' interaction with a patient with the in-room precepting. I think it provides equal if not better care, more broad teaching and I think both students and patients and faculty too find it well received. So I'm switching.
Sample Learner Responses	
Teaching using PIPP	<ul style="list-style-type: none"> • Typically when I was precepting out of the room I would be telling the same length of story and then I would watch as the preceptor went back into the room and ask them either the same questions or verify the same story I told them. Whereas when I precept inside of the room, it's just a matter of, "Does that sound right?" and the patient nodding. So you're not rehashing the same story or the same questions over and over again. • I think the teaching is a lot better in the room because when you're trying to explain something to the patient or talking about things in front of the patient, questions come up from the patients themselves. • [With PIPP], most of the preceptors got around to asking me what I thought the diagnosis was or what I wanted to do for a plan but that was it...Whereas teaching outside of the room, they would typically—I don't want to say "pimp"—but ask me questions about certain diagnoses or how I would differentiate these or just other teaching points that really were never asked inside in front of the patients. • I felt like sometimes patients had to repeat the same things that I had presented just because now the doctor was in the room and so the patient wanted to repeat everything . . . for the doctor to hear.
Patient engagement	<ul style="list-style-type: none"> • I liked that it [increased] the transparency of the whole thing, and really showed the patient exactly what the process was, and that we had actually listened to all of their complaints and considered all their concerns and really thought through everything and gave them a chance to change things or correct things or add things that they hadn't thought of earlier. It really makes them a player and gives them a role in the process. I think they liked that and I appreciated it too.
Concern about performing poorly	<ul style="list-style-type: none"> • I think in front of the patient, staff didn't want to put me in a position where I didn't know what I was saying or doing and so I think they were less inclined to challenge me, whereas outside the room they kind of probed more and kind of got me to think about the entire differential given the patient's past medical history. Overall I think teaching was good regardless of whether it was in the room or outside the room. If they weren't able to do it in the room, they would take the time afterwards to do it.

(continued on next page)

Table 4: Continued

Choosing words carefully	<ul style="list-style-type: none"> • I really enjoyed the fact that I was able to clearly communicate what I was saying without the language barrier, without the jargon that doctors use. It allowed me to have a conversation both with the patient and the attending at the same time, which I enjoyed. • I definitely learned how to involve the patient more when I'm talking. Sometimes you have the urge to use big words. There have been attendings that have told me not to do that. Dr **** said you can use big words so long as you explain to the patient what that means, so I had to pay attention to what I was saying. And at the end of the day, we're going to have to deal with patients so it was good experience in that regard. • Teaching in front of the patient you have to keep in mind that they're listening and that they may not understand things in the same way so you might have to explain things slightly differently sometimes. You have to be a little more thoughtful, which can be good, because you're choosing your words because when you say things medically, they have connotations that the patient doesn't quite understand. Like, when you say mass, we may be talking about a sebaceous cyst but they think cancer. So we have to be careful with our words and very thoughtful about it.
Sample Interpreter Response	
Interpreter preferred PIPP	<ul style="list-style-type: none"> • I think [PIPP] made my job easier—when they come together at the same time, I can interpret patient to doctor, or doctor to patient, right away. At the same time, it would save time. I find it makes them more active and that they benefit more.

have on reducing the time and cost of precepting.

While previous outpatient RCTs¹⁰⁻¹² have found PIPP to be effective with medical residents, this study has demonstrated for the first time that PIPP can be used effectively by primary care physicians who precept medical students. It is particularly time efficient, much preferred by family physician faculty and can be used both with non-English speaking patients and patients with low literacy and socio-economic status.

ACKNOWLEDGMENTS: The authors acknowledge the assistance of Scott Bischoff, Department of Family Medicine, University of Minnesota, in preparing the manuscript.

Support: The authors wish to acknowledge the financial support provided by a Herz Faculty Development Award from the University Medical Foundation.

Presentations: This work has been presented as original research in progress at the Society of Teachers of Family Medicine (STFM) 2013 Conference on Medical Student Education and as completed research at the 2014 STFM Annual Spring Conference.

CORRESPONDING AUTHOR: Address correspondence to Dr Power, University of Minnesota Medical School, Department of Family Medicine and Community Health, Mayo Mail Code 381, 420 Delaware Street SE, Minneapolis, MN 55455. 612 624 2138. Fax: 612-625-0916. power007@umn.edu.

References

1. Osler W. On the need of a radical reform in our methods of teaching senior students. *The Medical News* 1903;82:49-53.
2. Heidenreich C, Lye P, Simpson D, Lourich M. The search for effective and efficient ambulatory teaching methods through the literature. *Pediatrics* 2000;105:231-7.
3. Bromberg MB, Singleton JR, Forshe DA. The use of "clinic room" presentation as an educational tool in the ambulatory care setting. *Neurology* 1999;52:317-20.
4. Gonzalo JD, Heist BS, Duffy BL, et al. The art of bedside rounds: a multi-center qualitative study of strategies used by experienced bedside teachers. *J Gen Intern Med* 2012 Nov 6;28(3):412-20.
5. Heaton CJ. Patient witnessed precepting: faster precepting that is effective and fun. *Fam Med* 2009;41(10):696.
6. Dunham D, Butter J, Liss D, Wayne D, Green M, Baker D. Patient and physician perceptions of examination room versus traditional presentations in a resident medicine clinic. *J Life Sci* 2009;1(1):1-7.
7. Baker RC, Klein M, Samaan Z, Brinkman W. Exam room presentations and teaching in outpatient pediatrics: effects on visit duration and parent, attending physician, and resident perceptions. *Ambul Pediatr* 2007 Sep-Oct; 7(5):354-9.
8. Smith AG, Bromberg MB, Singleton JR, Forshe DA. The use of "clinic room" presentation as an educational tool in the ambulatory care setting. *Neurology* 1999;52:317-20.
9. Rogers HD, Carline JD, Paaaw DS. Examination room presentations in general internal medicine clinic: patients' and students' perceptions. *Acad Med* 2003;78:945-9.
10. Petersen K, Rosenbaum ME, Kreiter CD, Thomas A, Vogelgesang SA, Lawry GV. A randomized controlled study comparing educational outcomes of examination room versus conference room staffing. *Teach Learn Med* 2008 Jul-Sep;20(3):218-24.
11. Madson L, Rosenbaum M, Kreiter C, Lynch A, Witt A. A randomized controlled trial assessing the feasibility of examination room versus conference room teaching in a psychiatric setting. *Teach Learn Med* 2014;26(1):40-8.
12. Ricer RE, Van Horne A, Filak AT. Costs of preceptors' time spent teaching during a third-year family medicine outpatient rotation. *Acad Med* 1997 Jun;72(6):547-51.