

# Teaching Points Identified by Preceptors Observing One-Minute Preceptor and Traditional Preceptor Encounters

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## ABSTRACT

**Purpose.** This study examined the teaching points made by preceptors in response to two videotaped teaching encounters to determine if (1) different preceptors use similar teaching points in response to the same case, (2) preceptors' teaching points vary by case, and (3) preceptors' teaching points vary by teaching model (One-Minute Preceptor and traditional preceptor models).

**Method.** Preceptors ( $n = 116$ ) at seven universities participated in a within-groups experimental design study in 2000. The preceptors viewed videotaped encounters depicting two cases and two precepting models. They were asked to list two teaching points after viewing the initial case presentations and after the teaching encounters were completed. Frequency of teaching points listed by preceptors was examined for each case and teaching model. Teaching points were coded using qualitative methods and then analyzed using repeated-measures analysis of variance.

**Results.** Of the 843 total teaching points identified by preceptors, 63 were discrete teaching points that were aggregated into 15 categories. Most preceptors (82%) listed three to five separate teaching points, which varied significantly by case and model. Those observing the traditional precepting model were more likely to teach generic skills such as history-taking skills, presentation skills, and risk factors, and those observing the One-Minute Preceptor were more likely to teach about the illness focusing on a broader differential diagnosis, further diagnostic tests, and the natural presentation of disease.

**Conclusions.** Preceptors use three to five common teaching points that vary by case and teaching model. The One-Minute Preceptor model shifted teaching points away from generic clinical skills toward disease-specific teaching.

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In the fast-paced ambulatory clinic, speed and accuracy are essential skills for patient care and clinical teaching. Time-efficient preceptors teach quickly

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*For a report on a related topic, see pp. 42–49.*

and precisely because they have a large repertoire of teaching scripts memorized. Preceptors develop these teaching scripts over time as they explain concepts and skills repetitively. The key components of clinical preceptor's teaching scripts are three to five teaching points with supporting material and an understanding of common errors made by learners in mastering this material.<sup>1,2</sup> These scripts, like scripts of a play, guide the teaching interaction around case presentations and discussions, enabling teachers to focus on the learner and the patient without overloading their working memory. Scripts

are organized to support specific tasks, stored in memory for instant accessing, and used for clinical reasoning in medicine (illness scripts),<sup>3,4</sup> nursing (nursing scripts),<sup>5,6</sup> physical therapy (movement scripts),<sup>7</sup> and teaching (curriculum scripts and teaching scripts).<sup>8–10</sup>

The literature about the nature of teaching scripts used by clinical preceptors conflicts. Research with expert internal medicine (IM) preceptors found only moderate commonality among the teaching points stimulated in response to a diabetic ketoacidosis case.<sup>1</sup> In a study of pediatrics clerkship directors, a strong uniformity among teaching

**Table 1**

Order of Case and Precepting Models on Two Sets of Videotaped Precepting Scenarios*		
Videotape	Order (Case – Precepting Model)	
One	Case 1–Traditional	Case 2–One-Minute Preceptor
Two	Case 2–One-Minute Preceptor	Case 1–Traditional
Three	Case 2–Traditional	Case 1–One-Minute Preceptor
Four	Case 1–One-Minute Preceptor	Case 2–Traditional

\*Case 1 was pneumothorax, Case 2 was hiatal hernia and gastroesophageal reflux.

points was found for several common clinical scenarios.<sup>11</sup> Do preceptors teach similar points in response to common primary care cases? Do preceptors tend to teach generic skills (such as taking a history, performing a physical examination, or presenting the case) or do they teach about the illness itself (such as expanding the differential diagnosis, identifying risk factors, or exploring further tests to verify the illness)? Do the teaching points vary by case and by teaching model used by the preceptor?

One general teaching script frequently advocated in the literature is the One-Minute Preceptor (OMP).<sup>12</sup> The OMP offers a prototypical set of teacher's actions that can be adapted to almost any case presentation. Its purpose is to aid the teacher in diagnosing both the learner and the patient. The OMP teaching script consists of five steps: (1) get a commitment (ask the learner what he or she thinks is going on with the patient), (2) probe for underlying reasoning (ask what led to that conclusion), (3) teach a general rule, (4) provide positive feedback, and (5) correct mistakes. Teaching points occur at Step 3 in this model and are guided by the results of diagnostic Steps 1 and 2. The OMP is asserted to be a time-efficient and effective teaching strategy for clinical settings of medicine.<sup>12–17</sup>

The more typical or "traditional" precepting model (TP) or script focuses primarily on diagnosing the patient. In the TP, the preceptor asks questions

about the patient to diagnose the patient's problem.<sup>18</sup> However, this rarely reveals the learner's thinking process and often leads to a mismatch between what the preceptor decides to teach and what the learner needs to know or results in no teaching at all.

This report examines the teaching points of primary care preceptors who participated in a study of the effects of the OMP on the ability of the preceptor to correctly diagnose the patient and the learner. Results of that study are reported elsewhere in this issue.<sup>19</sup> In relation to the teaching script portion of the study, we asked the following questions: Do different preceptors who observe the same case list similar teaching points? Do these preceptors' teaching points vary by case? Do these preceptors' teaching points vary by teaching model (OMP versus TP)?

## METHOD

### Design

To compare the effectiveness of OMP with TP in ambulatory teaching, a within-groups experimental design was conducted in 2000. Two third-year medical students performed a focused history and physical examination on two standardized patients: one with pneumothorax and the other with a hiatal hernia and gastroesophageal reflux. They presented the case to the physician-investigator (EA) trained in both TP and

OMP, who precepted the students twice—once using each model.

The presentations were videotaped, and the videotapes were then used to create four entirely scripted encounters. The final four videotapes each contained the two cases demonstrating the two models in four different orders (see Table 1). This design allowed us to control case and teaching model order as possible confounders. The use of acting scripts provided complete standardization of the students' presentations so that the only variation in the videotapes was that of the teaching model. Patient information, teaching points, and length of the encounter were the same.

### Sample

A convenience sample of participants in faculty-development fellowship programs was obtained by contacting nationally recognized leaders in faculty development. Seven of these leaders from different universities agreed to implement the research protocol in the context of their programs.

The 116 participants were family medicine, IM, and pediatrics faculty, and a few fellows and chief residents who serve as preceptors for medical students in the outpatient setting from the following universities: University of California, San Francisco, School of Medicine ( $n = 22$ , 19%); Harvard Medical School (HMS) ( $n = 10$ , 9%); University of North Carolina at Chapel Hill School of Medicine ( $n = 28$ , 24%); Keck School of Medicine of the University of Southern California ( $n = 10$ , 9%); University of Texas Medical School at San Antonio ( $n = 17$ , 15%); University of Washington School of Medicine ( $n = 11$ , 9%); and the University of Wisconsin Medical School ( $n = 18$ , 15%). Many of these preceptors were enrolled in faculty-development programs.

The preceptors were from departments of IM (55%), family medicine (28%), pediatrics (4%), psychiatry (3%), and other (9%). Nine percent were professors, and the remaining ranks were 13% associate professors, 34% assistant professors, 16% instructors, 10% fellows, 15% residents, and 3% other. The average number of years of precepting in ambulatory settings was 5.4 with a range of zero to 25 years. Thirty-seven percent were women and 63% were men. Approximately 35% of the preceptors had been previously exposed to OMP and 16% had used the model in their teaching. Despite being exposed to it, only 7% were able to correctly identify three or more of the OMP features, and none correctly identified all five features.

## Procedure

The study was explained to the preceptors, and they completed an informed consent form at the beginning of the videotape in accordance with the approved Human Subjects Review protocol. The videotape was stopped four times, twice per case, so that preceptors could complete each section of the questionnaire as the case was successively disclosed. Stop 1 for each case was at the end of the initial case presentation by the student. The case presentations were identical up to Stop 1 regardless of the precepting model being demonstrated. Stop 2 for each case occurred after the preceptor asked her questions and completed the discussion. Preceptors were asked after each stop to state in writing what two teaching points the student would most benefit from receiving. After completing the study, preceptors frequently discussed the models observed as part of a faculty-development workshop; however, no discussion of the videotape or models was allowed until after the questionnaire was completed.

## Data Analysis

The teaching points were coded by the physician-investigator (EA) to ensure consistency. Another author (DI) verified selected segments of the coding. After all discrete teaching points were identified ( $n = 63$ ), associated teaching points were clustered under 15 common headings such as history-taking skills, physical examination skills, or differential diagnosis.

To assess the differences in frequencies of teaching points between the pneumothorax and the hiatal hernia and gastroesophageal reflux cases and between the OMP and TP, a repeated-measures analysis of variance was used. To control for any potential differences in the case order or model order observed, videotape was used as a covariate. A repeated-measures design was selected because the same preceptors were exposed to different types of treatment

and served as their own controls.<sup>20</sup> The  $p = .05$  level of significance was selected given the preliminary nature of the study.

## RESULTS

### Commonality of Teaching Points among Preceptors

The total number of teaching points identified by participants in the study was 843. These were coded into 63 discrete teaching points and aggregated into 15 categories. There was a great deal of diversity among teaching points across stops and cases that ranged from one teaching point being mentioned once (doctor-patient relationship) to another identified 233 times (teaching history-taking skills). Most teaching points ( $n = 766$ , 91%) were associated with the top seven aggregated categories; therefore, all analyses were based on the top seven categories (see Table 2).

Table 2

Number of Teaching Points by Category Made by 116 Primary Care Preceptors in Response to Viewing Two Videotaped Case Presentations*			
Teaching Point Category	Case		Total
	Pneumothorax	Hiatal Hernia and Gastroesophageal Reflux	
History-taking skills	133	100	233
Consider a broader differential diagnosis	108	72	180
Presentation skills	45	67	112
Physical exam skills	62	46	108
Risk factors	19	41	60
Diagnostic tests/evaluation	10	36	46
Presentation of disease	6	21	27
Give feedback	11	12	23
Formulate an assessment and plan	10	13	23
Therapy	2	9	11
Physical findings	4	3	7
Psychiatric illness	—	5	5
Concept of referred pain	4	1	5
Encourage reading	2	—	2
Physician—patient relationship	1	—	1
Total	417	426	843

\*Number equals combined teaching points listed by preceptors at two stops during each videotape.

Table 3

Category of Teaching Points	Stop 1		Stop 2		Combined	
	Pneumothorax	Hiatal Hernia and Gastroesophageal	Pneumothorax	Hiatal Hernia and Gastroesophageal	Pneumothorax	Hiatal Hernia and Gastroesophageal
		Reflux		Reflux		Reflux
History-taking skills	82†	60	51	40	133†	100
Differential diagnosis	36	36	72†	36	108†	72
Presentation skills	29	36	16	31†	45	67
Physical exam skills	38	36	24†	10	62	46
Risk factors	3	20	16	21	19	41†
Diagnostic tests/evaluations	2	2	8	34†	10	36†
Presentation of disease	2	6	4	15†	6	21†

\*Teaching points were recorded when videotapes were stopped twice per case: after the initial case presentation (Stop 1) and after inquiry and discussion (Stop 2). Repeated-measures ANOVA was computed for the first seven items only. Comparisons were made between cases within each stop. Videotape was a covariate to control for combinations of cases and models.

† $p < .05$ .

Out of eight possible teaching points for both cases combined, the majority of preceptors (82%) listed three to five separate teaching points: two points ( $n = 8$ , 7%), three points ( $n = 20$ , 18%), four points ( $n = 48$ , 43%), five points ( $n = 23$ , 21%), six points ( $n = 10$ , 9%) or seven points ( $n = 2$ , 2%).

#### Variability of Teaching Points between Cases

We compared the frequency of teaching points made in the pneumothorax case with those made in the hiatal hernia and gastroesophageal reflux case at each stop and overall (see Table 3). When Stops 1 and 2 were combined, significant differences between cases were observed for five out of seven teaching points. In the pneumothorax case, the frequencies were significantly higher for history taking and considering broader differential diagnoses. In the hiatal hernia and gastroesophageal reflux case, the frequencies were significantly higher for risk factors, considering diagnostic tests, and presentation of disease.

#### Variability of Teaching Points between Precepting Models

Frequency of teaching points for both OMP and TP at both stops is listed in Table 4. At Stop 1, we found no significant differences in the frequencies of teaching points mentioned between the OMP and TP except that those viewing the TP presentation more frequently identified history-taking skills. Because both groups viewed the identical presentation, there is no logical explanation for this spurious finding. At Stop 2, significantly higher frequencies of history-taking skills, presentation skills, and risk factors were found for TP. Alternatively, the frequencies of considering an appropriate or broader differential diagnosis, diagnostic tests and evaluations, and presentation of disease were significantly higher for OMP.

#### DISCUSSION

One of the important roles of teaching scripts is to reduce cognitive load in the moment and allow professionals to perform without conscious thought. We

found that the most frequently identified teaching points—history-taking skills, presentation skills, physical examination skills, and considering a broader differential diagnosis—were generic and easily adapted to any case. Perhaps this is why they are used so frequently. They are also not case specific, although they can be customized to be so.

According to Shulman,<sup>10</sup> the unique form of teacher knowledge, pedagogical-content knowledge, is knowing how to transform subject matter content into understandable and accessible knowledge at the appropriate level for the learner. The teaching scripts identified in this study were written as general teaching points. However, our observations of clinical preceptors in action indicate that these general teaching points, such as teach presentation skills, are customized to the learner and the case at hand (e.g., “When presenting a case with a chief complaint of chest pain and shortness of breath, you need to include general appearance, respiratory rate, heart rate, blood pressure, and oxygen saturation”). Thus, what appears to be a general teaching point becomes

Table 4

Teaching Points	Comparison of Seven Categories of Teaching Points by Model of Precepting (One-Minute Preceptor and Traditional Models) Made by 116 Primary Care Preceptors after Viewing Two Videotaped Case Presentations, Using Repeated-Measures Analysis of Variance*			
	Stop 1		Stop 2	
	OMP	Traditional	OMP	Traditional
History-taking skills	59	83†	27	64†
Differential diagnosis	31	41	65†	43
Presentation skills	36	29	13	34†
Physical exam skills	43	31	18	16
Risk factors	14	9	4	33†
Diagnostic tests/evaluations	3	1	37†	5
Presentation of disease	6	2	16†	3

\*Teaching points were recorded when videotapes were stopped twice per case: after the initial case presentation (Stop 1) and after inquiry and discussion (Stop 2). Repeated-measures ANOVA was computed for the first seven items only. Comparisons were made between One-Minute Preceptor and traditional preceptor models within each stop. Videotape was a covariate to control for combinations of cases and models.

† $p < .05$ .

customized and specific when used with a particular learner and specific illness.

In this study, each case triggered four or five teaching points. The top seven teaching points accounted for 91% of all teaching points and the majority of preceptors identified several of the top teaching points. This is consistent with Irby's original work on teaching scripts of internists<sup>1,2</sup> and Marcante and Simpson's study of pediatrics clerkship directors.<sup>11</sup> Both studies reported three to five commonly identified teaching points per case with the majority of their respondents' identifying at least one of three or four common teaching points in the two cases. However, in our study this surface commonality is based on 63 different points clustered under 15 main headings. Because this study and that of Marcante and Simpson restricted the number of possible teaching points listed, the four or five teaching point average may be artificially constrained.

One of the important findings of this study is that after observing the OMP, preceptors changed the kind of teaching points that they would normally make.

Under normal circumstances, preceptors tend to teach general process skills as evidenced at Stop 1 for both models and at Stop 2 for the traditional model. However, after observing the OMP, preceptors shifted toward teaching about the disease and disease processes. The model changed what preceptors would teach by focusing on higher-order thinking rather than general processes. One interpretation of this finding would be that the OMP reveals more of the thinking of the learner and, therefore, shifts the teaching points used. If the purpose of the case presentation and discussion is to provide instruction targeted at the learner's point of need, then the OMP might be better able to do so.

Case specificity has been a consistent finding in studies of physicians' clinical reasoning.<sup>4</sup> In our study, we found significant differences between cases in two out of seven teaching points at Stop 1 and five out of seven teaching points at Stop 2. Of these differences, the pneumothorax case had significantly more teaching points for history-taking skills, physical examination skills, and considering a broader differential diag-

nosis, whereas the hiatal hernia and gastroesophageal reflux case had more teaching points associated with diagnostic testing, presentation skills, and presentation of disease. This is partially explained by the difficulty of making a diagnosis of pneumothorax, the need for a careful history and physical examination, and the need to consider a broader differential diagnosis. Alternatively, hiatal hernia and gastroesophageal reflux is more common and has a straightforward historical and clinical presentation. Thus, the focus of teaching can be shifted toward presentation of disease and treatment. Therefore, the nature of the illness appears to influence both the number and type of teaching points selected.

Our study has a number of limitations. Although we randomly stratified case order and model order, we were not able to use a true randomized controlled trial for selecting participants. We attempted to limit this bias with a rigorous experimental study design and attention to controlling for known and likely confounders during data analysis. Many of the preceptors in our study were participants in faculty-development programs. As such, they may have been more likely to be exposed to and recognize the OMP than would other preceptors, although none of the study participants were able to recall all five steps in the model. Because preceptors were asked to write only two teaching points at each stop in the videotape, this restricted the number of teaching points they could list. Thus, four or five teaching points might be artificially low. The physician-investigator coded all of the teaching points and may have coded incorrectly. However, this did provide consistency in coding and another author verified samples of the data. The teaching points portrayed on the videotapes may have cued preceptors' responses, although the most frequently listed teaching point was not demonstrated in either case and less than 50% of the preceptors' responses were the same as those presented in the videotapes. Finally, the



preceptors in the study were observers and not actually precepting. On the other hand, the case presentations they observed were based upon a real clinical interaction and faithfully simulated typical precepting encounters.

This study also has several important strengths. The relatively large sample size and the use of preceptors from multiple specialties and institutions enhance the quality and generalizability of this study.

### CONCLUSIONS

Preceptors who observed videotapes of two different clinical case presentations and two different precepting models identified a common set of three to five teaching points. These common teaching points varied by case and by teaching model. The One-Minute Preceptor model modified the teaching points selected to promote disease-specific thinking rather than acquisition of generic clinical skills.

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### REFERENCES

1. Irby DM. How attending physicians make instructional decisions when conducting teaching rounds. *Acad Med.* 1992;67:630–8.
2. Irby DM. What clinical teachers in medicine need to know. *Acad Med.* 1994;69:333–342.
3. Charlin B, Tardif J, Boshuizen H. Scripts and medical diagnostic knowledge: theory and applications for clinical reasoning instruction and research. *Acad Med.* 2000;75:182–90.
4. Schmidt H, Norman G, Boshuizen H. A cognitive perspective on medical expertise: theory and implications. *Acad Med.* 1990;65:611–21.
5. Greenwood J. Critical thinking and nursing scripts: the case for the development of both. *J Adv Nurs.* 2000;31:428–36.
6. Greenwood J, Sullivan J, Spence K, McDonald M. Nursing scripts and the organizational influences on critical thinking: report of a study of neonatal nurses' clinical reasoning. *J Adv Nurs.* 2000;31:1106–14.
7. Embrey DG, Guthrie MR, White O, Dietz J. Clinical decision making by experienced and inexperienced pediatric physical therapists for children with diplegic cerebral palsy. *Phys Ther.* 1996;76:20–33.
8. Putnam R. Structuring and adjusting content for students: a study of live and simulated tutoring of addition. *Am Educ Res J.* 1987;24:13–48.
9. Grossman P. *The Making of A Teacher: Teacher Knowledge and Teacher Education.* New York: Teachers College Press, 1990.
10. Shulman L. Knowledge and teaching: foundations of a new reform. *Harvard Educ Rev.* 1987;57:1–22.
11. Marcdante K, Simpson D. How pediatric educators know what to teach: the use of teaching scripts. *Pediatrics.* 1999;104:148–50.
12. Neher JO, Gordon KC, Meyer B, Stevens N. A five-step "microskills" model of clinical teaching. *J Am Board Fam Pract.* 1992;5:419–24.
13. Usatine RP, Nguyen K, Randall J, Irby DM. Four exemplary preceptors' strategies for efficient teaching in managed care settings. *Acad Med.* 1997;72:766–9.
14. Paccione GA, Cohen E, Schwartz CE. From forms to focus: a new teaching model in ambulatory medicine. *Arch Intern Med.* 1989;149:2407–11.
15. Hewson MG. Clinical teaching in the ambulatory setting. *J Gen Intern Med.* 1992;7:76–82.
16. Ferenchick G, Simpson D, Blackman J, DaRosa D, Dunnington G. Strategies for efficient and effective teaching in the ambulatory setting. *Acad Med.* 1997;72:277–80.
17. Lesky LG, Hershman WY. Practical approaches to a major educational challenge: Training students in the ambulatory setting. *Arch Intern Med.* 1995;155:897–904.
18. Knudson MP, Lawler FH, Squeig SC, Moreno CA, Hosokawa MC, Black RL. Analysis of resident and attending physician interactions in family medicine. *J Fam Pract.* 1989;28:705–9.
19. Aagaard E, Teherani A, Irby D. The effectiveness of the one-minute preceptor model for diagnosing the patient and the learner. 2004;79:42–49.
20. Munro B. *Statistical Methods for Health Care Research.* Philadelphia, PA: Lippincott Williams & Wilkins, 2001.