

# Effective Clinical Education: Strategies for Teaching Medical Students and Residents in the Office

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## ABSTRACT

**Problem:** Educating medical students and residents in the office presents the challenges of providing quality medical care, maintaining efficiency, and incorporating meaningful education for learners. Numerous teaching strategies to address these challenges have been described in the medical educational literature, but only a few teaching strategies have been evaluated for their impact on education and office practice.

**Methods:** Literature on the impact of office-based teaching strategies on educational outcomes and on office efficiency was selected from a Pub Med search, from review of references in retrieved articles, and from the author's personal files.

**Results:** Two teaching strategies, "one-minute preceptor" (OMP) and "SNAPPS," have been shown to improve educational processes and outcomes. Two additional strategies, "Aunt Minnie" pattern recognition and "activated demonstration," show promise but have not been fully evaluated. None of these strategies has been shown to improve office efficiency.

**Conclusions:** OMP and SNAPPS are strategies that can be used in office precepting to improve educational processes and outcomes, while pattern recognition and activated demonstration show promise but need further assessment. Additional areas of research also are suggested.

## INTRODUCTION

Educating medical students and residents in the office setting presents the simultaneous challenges of providing quality medical care, maintaining efficiency, and incorporating meaningful education for learners. A recent literature review identified several common barriers that often impede effective clinical teaching, including time constraints, inadequate institutional financial support, lack of access to educational specialists, and lack of access to appropriate educational space and

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resources.<sup>1</sup> Furthermore, research has demonstrated that physicians who precept medical students typically spend a significant amount of extra time teaching, consequently seeing fewer patients and losing income.<sup>2</sup>

A study of clinical preceptors found that 3 factors commonly influence which patients are selected by preceptors for teaching encounters with medical students: the potential influence of teaching on the doctor-patient relationship, the educational value for the student, and considerations of time and efficiency.<sup>3</sup>

The impact of teaching on the doctor-patient relationship can be influenced by whether a patient is estab-

lished and returning for follow-up, and perhaps more likely to want only a known and trusted physician, or new and perhaps more likely to provide an opportunity for the learner to have a "fresh start" on a clinical problem. The educational potential in patient visits may be related to the opportunity for the learner to have a "fresh start" on a new clinical problem or diagnosis, or the opportunity for the learner to "shadow" in multiple visits to maximize exposure to patients and diagnoses. Time for and efficiency of teaching is influenced by patient volume for the clinical day and the balance between visits for follow-up of established problems vs visits for new or undiagnosed complaints.

Numerous models or strategies for clinical teaching have been described in the medical education literature. This article reviews 4 specific clinical teaching strategies and the evidence for their impact on educational outcomes or office efficiency. Literature for this review was selected based on the results of a Pub Med search on the terms "medical student" and "precepting," review of references in retrieved articles, and the author's personal files.

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## “One-Minute Precepting”—Education Using the 5 “Microskills”

The “one-minute preceptor” (OMP) strategy, first described in the early 1990s, recommends 5 key steps or “microskills” for an effective teaching encounter (Table 1).<sup>4</sup> First, “getting a commitment,” with questions such as “What do you want to do?” or “If I weren’t here, what would you do for the patient?” is designed to encourage the learner’s processing and synthesis of information obtained from the patient. Second, “probing for supporting evidence” with questions such as “What factors did you consider in making that decision?” or “Were there other options you considered and discarded?” is meant to help the preceptor understand the learner’s fund of knowledge, analytic processes, and areas for further learning. Third, “teaching general rules applicable to the case at hand,” with a “mini-lecture” or suggested reading, is recommended to help the learner understand application of general medical reasoning and principles to individual cases. The fourth and fifth steps, “reinforcing what was done right” and “correcting mistakes,” involve providing descriptive, case-specific and behavior-focused feedback to the learner.<sup>4</sup>

In a study comparing the OMP model with “traditional models of ambulatory teaching,” 116 preceptors (primarily representing internal or family medicine) in 7 different faculty development programs watched videotaped teaching encounters of both OMP and traditional precepting. Those preceptors watching the OMP encounters were equally or better able to diagnose the patient’s medical problem compared to preceptors who watched encounters using a traditional teaching model. Preceptors watching videotapes of the OMP model also rated students’ abilities higher on history taking and physical examination, presentations, clinical reasoning, and fund of knowledge. Preceptors watching tapes of OMP precepting also rated themselves as more confident in evaluating students’ abilities.<sup>5</sup> The same study also found that preceptors using the OMP model tended to provide more emphasis on disease-specific teaching and focused more on higher-order thinking rather than on general disease processes.<sup>6</sup> A second study by the same investigators, in which 164 third- and fourth-year medical students viewed traditional or OMP teaching encounters, found students rated OMP more effective than traditional teaching.<sup>7</sup>

In a study of residents with inpatient teaching responsibilities, 28 residents who received a 1-hour lunchtime training session on OMP were compared with 29 control residents. The residents trained in OMP were rated more highly afterward by their students on measures of “asking for a commitment,” “providing feedback,” and “motivating me to do outside reading.” However, there was no difference between the 2 groups in students’ ratings of their “overall teaching effectiveness.”<sup>8</sup> A separate investigation using quantitative analysis of audiotaped

**Table 1.** One-Minute Precepting (OMP)<sup>4</sup>

1. Get a commitment
2. Probe for supporting evidence
3. Teach general rules
4. Reinforce what was done right
5. Correct mistakes

**Table 2.** SNAPPS<sup>10</sup>

1. Summarize relevant history and physical findings
2. Narrow the differential: Likely? Relevant?
3. Analyze the differential
4. Probe the preceptor
5. Plan patient management
6. Select a case-related learning issue

teaching encounters found that after participation in a set of three 90-minute faculty development seminars on the OMP model, faculty preceptors improved in the specificity of their feedback to students.<sup>9</sup>

## SNAPPS—Learner-Led Education

The SNAPPS strategy was developed based on cognitive learning and reflective practice theory. This approach emphasizes active learning and casts the precepting encounter as a learner-led experience. The SNAPPS acronym derives from the 6 steps of the process (Table 2). First, the student is asked to Summarize, generally in 3 minutes or less, the relevant history and physical findings. Second, the student is asked to Narrow the differential diagnosis or possible interventions to the 2 or 3 most relevant and likely possibilities. Commitment to an initial decision on the part of the student, prior to preceptor input, is a key part of this teaching strategy. Third, the learner should Analyze the differential by comparing and contrasting the possible explanations. This allows the learner to verbalize thought processes. Fourth, the learner is asked to Probe the preceptor by asking about uncertainties, difficulties, or other approaches. This allows the preceptor insight into the learner’s thought process and knowledge base, and teaches the student to see the preceptor as a knowledge resource. Fifth, to Plan management of the patient, the learner initiates a discussion with the preceptor by attempting either a brief management plan or suggesting specific interventions and then further refining these with preceptor input. Lastly, the learner is asked to Select a case-related issue for self-directed learning and reading, with preceptor input as needed to help focus the question or select learning resources.<sup>10</sup>

The 1 evaluation of SNAPPS that has been published compared preceptors trained in SNAPPS to preceptors given no specific educational instructions or just general instruction on feedback. This study found that students working with SNAPPS-trained preceptors were more concise in their summa-

**Table 3.** “Aunt Minnie”<sup>12,13</sup>

1. Student presents the chief complaint and the presumptive diagnosis
2. Student begins a write-up and preceptor evaluates the patient
3. Preceptor discusses case with student
4. Preceptor reviews and signs medical record

**Table 4.** Activated Demonstration<sup>17</sup>

1. Assess student’s relevant knowledge
2. Determine what the student should learn from the skill demonstration
3. Guidance for student participation during skill demonstration
4. Demonstrate the clinical skill
5. Discuss learning points with the student
6. Set an agenda for future learning opportunities

ries, presented more than twice as many diagnostic possibilities, and justified their diagnostic possibilities more often. SNAPPS students also performed better at contrasting hypotheses, expressing uncertainties, initiating discussion of management, and identifying learning topics.<sup>11</sup>

### “Aunt Minnie”—The Value of Pattern Recognition

Most clinical teaching methods focus on a critical-thinking discussion between student and preceptor, and at least a brief exploration of diagnostic or management options. In contrast, the “Aunt Minnie” approach has been described as a way to educationally employ the value of pattern recognition in clinical practice. So named for the principle that “If the lady across the street walks like your Aunt Minnie and dresses like your Aunt Minnie, she probably is your Aunt Minnie,” this approach has been advocated as actually representing the typical approach applied by most clinicians for common ambulatory problems. One approach to teaching “Aunt Minnie” pattern recognition is: (1) the student evaluates the patient then presents to the preceptor the chief complaint and the presumptive diagnosis, (2) the student begins a write-up and the preceptor evaluates the patient, (3) the preceptor discusses the case with the student, (4) the preceptor reviews and signs the medical record (Table 3).<sup>12,13</sup>

While the use of pattern recognition has been studied most thoroughly in radiology education, there has been only limited investigation of pattern-recognition education in clinical medicine. One study found that pattern-recognition could be used reliably in developing an end-of-rotation test for surgical clerkship students.<sup>14</sup> Another study compared instruction in clinical reasoning to “leaving students to their own intuitions regarding how best to approach new cases.” The investigators found that instruction to students to use familiarity-driven pattern recognition combined with careful consideration of the presenting features led to improved diagnostic accuracy.<sup>15</sup> Finally, a study comparing medical students’ diagnostic pattern recognition

and clinical data interpretation found that pattern recognition improved more quickly than data interpretation across all 4 years of medical school.<sup>16</sup> While none of these studies specifically assessed the proposed “Aunt Minnie” model of precepting described above, they do suggest a role for pattern recognition in medical education, which may bear further investigation.

### Activated Demonstration—Teaching a Skill

While knowledge and analytic thinking processes can be taught either in the examination room or separately in a precepting encounter, hands-on skills involving physical examination or procedural interventions require the preceptors’ presence in the patient room, demonstration, supervision, and feedback. “Activated demonstration” has been described as one way for a preceptor to maximize the educational value of a demonstration and provide the learner with more than just a passive experience (Table 4). Activated demonstration begins with determination of the learner’s relevant knowledge and the learning objectives for the demonstration. The preceptor then provides clear guidance as to what the learner should do during the skill demonstration, including discussions with and examination of the patient. After the skill demonstration, the preceptor discusses learning points with the learner and sets an agenda for future learning opportunities. An evaluation of preceptor training in this approach, conducted with 128 preceptors over 8 different sessions, found that preceptors improved in their ability to select learner-focused teaching strategies.<sup>17</sup>

### CONCLUSION

All 4 teaching models have the potential to help improve the effectiveness of office-based teaching. OMP has been evaluated most extensively, and has been shown to improve preceptor diagnosis of patients’ medical problems as well as emphasis on disease-specific teaching. OMP also improves preceptors’ performance on the specific teaching skills of getting a diagnostic commitment from the learner, motivating the learner to independent learning, and providing feedback. Students working with preceptors using OMP show improved history-taking and physical-examination abilities, case presentations, clinical reasoning skills, and knowledge base. SNAPPS has been evaluated less extensively, but it also shows promise for improving student case presentations, clinical reasoning, and independent learning. Studies have demonstrated that pattern recognition can play a role in teaching and testing clinical reasoning by students, and the “Aunt Minnie” approach to precepting is an intriguing application of pattern recognition to clinical teaching, but so far no formal evaluation of this teaching model has been published. Activated demonstration shows promise for improving the ability of preceptors to select learner-focused teaching strategies and is another teaching model that would

benefit from further evaluation and characterization as to its optimal use and benefits.

While the impact of teaching on office efficiency and physician productivity has been documented as a concern for clinical teachers, thus far only OMP and SNAPPS have been assessed for their impact on office efficiency, and neither OMP or SNAPPS has been found to shorten teaching encounters.<sup>9,11</sup>

Both OMP and SNAPPS demonstrate promise for improving learner's clinical skills, clinical reasoning, and motivation for independent learning. OMP also has been shown to improve precepting skills and has been proposed as a model that can be learned by new clinical teachers 1 micro-skill at a time. SNAPPS has the theoretical advantage of placing more emphasis on self-directed learning, but no comparison between SNAPPS and OMP in terms of their impact on self-directed learning has been done to date. Future research on clinical teaching could add to the body of knowledge in this area by focusing on several questions: Does either OMP or SNAPPS do more to encourage learner self-direction? What strategies can help improve the efficiency of office-based teaching? How can pattern-recognition and activated demonstration be used most helpfully in clinical teaching?

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## Appendix. Additional Resources

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# Quiz: Effective Clinical Education: Strategies for Teaching Medical Students and Residents in the Office

## EDUCATIONAL OBJECTIVES

- To describe 4 strategies for clinical teaching of students and residents in the office setting.
- To describe the evidence for improvements in educational outcomes associated with each teaching strategy.
- To compare and contrast the roles of teacher and learner in the One-Minute Preceptor (OMP) and SNAPPS strategies.

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## QUESTIONS

- Strategies for teaching clinical medicine described in this article include:
  - “OMP” or “one-minute precepting”
  - “SNAPPS” or learner-led education
  - Clinical lectures
  - “Aunt Minnie” or pattern recognition
  - Small group discussions led by a preceptor
  - Activated demonstration or teaching a skill

*Answer:*

- A, B, C, and F
- A, C, D, and E
- A, B, D, and F
- B, C, D, and E
- A, C, D, and F

- Which teaching strategies have been shown in studies to improve educational processes and outcomes?
  - “OMP” or “one-minute precepting”
  - “SNAPPS” or learner-led education

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- Clinical lectures
- “Aunt Minnie” or pattern recognition
- Small group discussions led by a preceptor
- Activated demonstration or teaching a skill

*Answer:*

- A, B, C, and F
- A and B
- A, C, and E
- A, B, and C
- All of the above

- Some of the elements of “one-minute precepting” include getting a commitment from the student, which is designed to encourage the learner’s processing and synthesis of information obtained from the patient, and then to ask for supporting evidence to help the preceptor understand the learner’s fund of knowledge, analytic processes, and areas for further learning.
  - True
  - False
- The SNAPPS strategy relies more on a preceptor-directed learning process in which the student is asked probing questions after their initial summary of the pertinent history and physical. It is designed to direct the student’s analysis to the most important features of the case.
  - True
  - False
- The “Aunt Minnie” pattern-recognition approach has been advocated as representing the typical approach applied by most physicians for common ambulatory problems.
  - True
  - False

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