

# Teaching models for outpatient medicine

Karen M Chacko<sup>1</sup>, Eva Aagard<sup>1</sup> and David Irby<sup>2</sup>

<sup>1</sup>University of Colorado at Denver Health Sciences Center, Denver, CO, USA

<sup>2</sup>University of California San Francisco, Berkeley, CA, USA

## INTRODUCTION

A third-year student in your busy ambulatory care clinic presents a case of a 34-year-old woman with a 3-day history of acute cough and fever. On physical examination, she has notably a temperature of 100.4 C and crackles in the right lower lobe on lung examination. How do you decide what to teach this student?

Ambulatory care for outpatients in clinic settings poses unique challenges to preceptors (teachers) and learners as a result of the pace of patient care and the limited time available for teaching. In addition to providing high-quality patient care, preceptors must integrate learners

into patient care delivery, teach efficiently, provide feedback in real time and evaluate learners' performances.<sup>1</sup> At the same time, they must engage in clinical instructional reasoning: diagnosing patients' problems, assessing learners' needs and using teaching scripts to provide targeted instruction.<sup>1,2</sup> This reasoning process is enacted through a variety of teaching/pedagogic strategies. In this article, we describe three teaching models: the traditional, One Minute Preceptor (OMP)<sup>3</sup> and SNAPPS<sup>4</sup> models.

## TRADITIONAL MODEL

How do you decide what and how to teach the medical student described above? Most preceptors

use the traditional or patient-centred model, in which the case is presented by the learner in a standardised format. The preceptor then asks several directed questions to clarify the history and physical examination findings better, in order to establish a differential diagnosis and a treatment plan. This process may take place during or after the presentation and is sometimes followed by a brief mini-lecture, which rarely contains feedback.<sup>5</sup> An example of the traditional teaching interaction after the case presentation is shown in Box 1.

The purpose of the traditional model is to allow the preceptor efficiently to extract the information necessary to make

## Box 1. Traditional preceptor model following the case presentation

Preceptor: 'Is the patient hypoxic? Is she immunosuppressed?'

Student: 'I don't know her pulse oximetry, but I'll go get it. She doesn't have HIV and isn't on steroids.'

Preceptor: 'OK. Sounds like she has pneumonia. Nice presentation. Get the pulse ox and we will get a chest X-ray and start her on therapy for community-acquired pneumonia. In a patient this age with no significant co-morbid conditions and this presentation, I would strongly consider an atypical pneumonia such as *Mycoplasma* or *Chlamydia*, but pneumococci are also very possible. Current recommendations are to treat with a macrolide if she has no risk factors for resistant infections. Let's start her on azithromycin.'

clinical decisions, allowing him or her to act as an expert consultant to the learner. The traditional model is perceived as both efficient and appropriate in many instances because patient care is the top priority. As both learners and preceptors are familiar with the style, no special training is required. However, several limitations of the model become apparent when evaluating how effective it is as a teaching tool in

the light of current perspectives on effective clinical teaching.<sup>6</sup> Specifically, the knowledge and reasoning of the learner remain unclear and so cannot be used to guide the teaching process. Teaching points are often general, not geared to the level of the individual learner and not readily translatable to future cases.<sup>7</sup> Feedback to the learner, if there is any, must be inferred by the learner from the patient care

decisions being dictated by the preceptor.

## ONE-MINUTE PRECEPTOR

An alternative, learner-centred approach was described in the early 1990s by Neher and colleagues.<sup>3</sup> The One-Minute Preceptor (OMP) model was developed as a way to enhance the teaching encounter in the ambulatory setting by making use

## Box 2. The One-Minute Preceptor model following the case presentation

### Get a commitment

Preceptor: 'What do you think is going on?'

Student: 'It could be pneumonia.'

### Probe for supporting evidence

Preceptor: 'Is there anything else to consider?'

Student: 'I guess it could be bronchitis or heart failure.'

Preceptor: 'Why did you rule those things out?'

Student: 'The focal findings as well as the fever make those less likely to me, but we should probably do a chest X-ray to confirm the diagnosis.'

Preceptor: 'Sounds like a good idea. What do you want to treat her with?'

Student: 'I'm not sure. Maybe amoxicillin?'

### Teach a general principle

Preceptor: 'The most likely bacterial aetiologies of pneumonia in this age group, and with no real co-morbid conditions, are pneumococci and the atypicals such as *Mycoplasma* and *Chlamydia*. To determine the most appropriate treatment, we need to determine whether this patient is at risk for resistant infections. Things to consider are immunosuppression, alcohol or drug use, recent antibiotic treatment, and even children at home in daycare or with a known history of resistant infections. If none of those things is present, we can start her on a macrolide such as azithromycin. Otherwise, we'll need to choose something with lower resistance rates, such as a quinolone.'

### Reinforce what was done well

Preceptor: 'Your presentation was well organised and concise. Your lung exam was accurate as well.'

### Correct learner's errors and make recommendations for improvement

Preceptor: 'It is important to include an oxygen saturation with the vital signs when considering certain lung processes. That helps me understand how sick the patient is and how quickly we need to act. Let's go and see her.'

of a set of five microskills for every patient encounter. Its popularity is underscored by the adoption of this model by the Royal College of Physicians as an approach that is taught in their 'Physicians as Educators' programme.<sup>8</sup> The five steps, illustrated in Box 2, are as follows:

1. Get a commitment from the learner about what he or she thinks is going on with the case
2. Probe for underlying reasoning to explore the learner's understanding
3. Teach general rules pertaining to the case
4. Provide positive feedback about what the learner did correctly

#### 5. Correct learner's errors and make recommendations for improvement.

The OMP offers several advantages in that it assesses learner knowledge and targets instruction to the level of the learner. Preceptors feel better able to diagnose both the patient and the learner's abilities when using this model.<sup>7</sup> Feedback is specific to the encounter and is routinely incorporated into each interaction. Furthermore, teaching points have been demonstrated to be more disease specific and based on higher-order thinking than in the traditional teaching model.<sup>2</sup> However, teaching staff must be trained in and practise the OMP model because it requires

additional cognitive capacity on the part of the preceptor, who must both diagnose the patient and respond to the learner.

### SNAPPS

A third model continues the shift towards a learner-centred approach by structuring the interaction with the learner in the lead.<sup>4</sup> SNAPPS comprises six steps that the learner largely controls (Box 3):

- 1 Summarise briefly the history and findings
- 2 Narrow the differential to two or three relevant possibilities
- 3 Analyse the differential by comparing and contrasting the possibilities

### Box 3. The SNAPPS model following the case presentation

#### Summarise briefly the history and findings:

Student: 'Mrs A is a 34-year-old woman with no significant past medical history who presents with a chief complaint of cough and fever. She states that she has been ill for 3 days, with a maximum temperature at home of 101°F. She has no rhinorrhoea, sore throat or ear or sinus symptoms, and no urinary or gastrointestinal symptoms. She has physical examination findings notable for a temperature of 100.4°F and crackles in the right lower lobe on lung exam. Her HEENT, cardiac and abdominal exams are normal.'

#### Narrow the differential to two or three relevant possibilities:

Student: 'I think it could be pneumonia, but I would also consider bronchitis or heart failure.'

#### Analyse the differential by comparing and contrasting the possibilities:

Student: 'I think pneumonia fits best since the lung findings are focal and there is a fever. I think that with bronchitis I probably shouldn't hear crackles, and with heart failure I would expect bilateral findings and other things on exam such as peripheral oedema or jugular venous distension. Plus, she has no risk factors for congestive heart failure and has an acute fever, both of which make heart failure less likely.'

#### Probe the preceptor by asking questions about uncertainties, difficulties or alternative approaches:

Student: 'I guess I'm not sure if I have to get a chest X-ray or if I can just treat her presumptively. I am also unsure what antibiotics would be best for her.'

#### Plan management for the patient's medical issues:

Student: 'I think I can just treat her presumptively without an X-ray and I guess I can use a macrolide.'

Preceptor: 'I think we first need a few other pieces of information in order to answer your questions, but I agree that pneumonia is most likely. We need to know if she is hypoxic in order to determine how quickly we need to act and whether she may require hospitalisation. I also like to hear all of the vital signs in a patient like this who is acutely ill, for the same reason. The most likely bacterial aetiologies of pneumonia in this age group, and with no real co-morbid conditions, are pneumococci and the atypicals such as *Mycoplasma* and *Chlamydia*. To determine the most appropriate treatment, we need to determine whether this patient is at risk for resistant infections. Things to consider are immunosuppression, alcohol or drug use, recent antibiotic treatment and even children at home in daycare or with a known history of resistant infections. If none of those things is present, we can start her on a macrolide such as azithromycin. Otherwise, we'll need to choose something with lower resistance rates, such as a quinolone.'

#### Select a case-related issue for self-directed learning:

Student: 'I didn't even think about resistant infections, which will change how I would think about treating pneumonia. I'll need to read more about that and how this changes the choice of medication.'

- 4 Probe the preceptor by asking questions about uncertainties, difficulties or alternative approaches
- 5 Plan management for the patient's medical issues
- 6 Select a case-related issue for self-directed learning.

The fourth step in the process, probing the preceptor for additional information, and the final step, selecting a case-related issue for self-directed learning, are the unique bits of this model. These learner-initiated actions totally reverse the typical interaction through the learner asking the preceptor questions about the case. This has the advantage of focusing the teaching specifically on the learner's needs. The strengths of this model therefore lie in the fact that it is learner initiated, learner directed and learner centred. Many preceptors will recognise this as more fitting for the advanced learner.<sup>9</sup>

Use of SNAPPS requires training of both teaching staff and students to be highly successful, and needs to be bought into by both parties. Teaching staff may be uncomfortable with the change in their role from that of expert clinician to that of facilitator, and students may feel equally uncomfortable being forced to take the lead. Furthermore, this model may be inappropriate for a novice learner or for those unable to take an accurate history reliably or give an organised and accurate oral presentation.

## REFLECTIONS ON THE MODELS

The OMP and SNAPPS models incorporate important cognitive and teaching principles that are known to aid learning. From the cognitive perspective, they activate the learner's prior knowledge and apply it to the case in hand.<sup>10</sup> By connecting prior formal knowledge to the case, learners' pattern recognition and illness



scripts are better developed and retained,<sup>11</sup> but the learner must actively engage in clinical reasoning rather than merely report patient data. Finally, these models push learners to the margins of their capabilities, where their uncertainties are found and can be addressed.

From a teaching strategies perspective, the focus of teaching on just a few key points in each case makes the teaching memorable and not overwhelming. The

hallmark of an effective preceptor is the ability to communicate knowledge to the learner in an understandable and powerful way. In order to do so, the preceptor needs to diagnose the learner.<sup>1</sup> Figure 1 represents the locus of control in the teaching interaction, pointing out in particular that SNAPPS promotes self-directed learning and active control of the learning process by the learner.

## SUMMARY

Each of the models has its place in the preceptor's instructional tool kit. The traditional model can be used where there is little time and the needs of the patient are

**Figure 1.** Locus of control of teaching interaction.  
 Traditional model: Preceptor > Learner  
 One-Minute Preceptor: Preceptor = Learner  
 SNAPPS: Preceptor < Learner



paramount. The OMP model is especially useful for learners who need preceptor guidance because the latter facilitates the interaction while focusing on the learner. Alternatively, SNAPPS is a truly learner-centred pedagogic strategy and is especially powerful for more advanced learners.

#### REFERENCES

1. Irby DM. How attending physicians make instructional decisions when conducting teaching rounds. *Acad Med* 1992;**67**:630–638.
2. Irby DM, Aagaard E, Teherani A. Teaching points identified by preceptors observing the One-Minute Preceptor and traditional preceptor

encounters. *Acad Med* 2004;**79**: 50–55.

3. Neher JO, Gordon KC, Meyer B, Stevens N. A five-step 'microskills' model of clinical teaching. *J Am Board Fam Prac* 1992;**5**:419–424.
4. Wolpaw TM, Wolpaw DR, Papp KK. SNAPPS: A learner-centered model for outpatient education. *Acad Med* 2003;**78**:893–898.
5. Irby, DM. Teaching and learning in ambulatory care settings: a thematic review of the literature. *Acad Med* 1995;**70**:898–931.
6. O'Malley PG, Kroenke K, Ritter J, Dy N, Pangaro L. What learners and teachers value most in ambulatory educational encounters: a prospective, qualitative study. *Acad Med* 1999;**74**:186–191.

7. Aagaard E, Teherani A, Irby DM. Effectiveness of the One-Minute Preceptor model for diagnosing the patient and the learner: proof of concept. *Acad Med* 2004;**79**:42–49.
8. Available at <http://www.rcplondon.ac.uk/professional/pae/index.htm> (accessed 12 March 2007).
9. Bowen JL. Educational strategies to promote clinical diagnostic reasoning. *N Engl J Med* 2006;**355**:2217–2225.
10. Bransford JD, Brown AL, Cocking RR. *How People Learn: Brain, mind, experience, and school*. Washington DC: National Academy Press, 1999.
11. Norman G. Building on experience – the development of clinical reasoning. *N Engl J Med* 2006;**355**:2251–2252.