Evaluating Students in Family Medicine Using Simulated Patients

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Various techniques have been used to evaluate students in family medicine clerkships and electives. Multiple choice or essay questions have been used extensively but are not satisfactory in testing some of the affective areas considered important for future family physicians. At Southern Illinois University School of Medicine, the Department of Family Practice has evolved an evaluation system using simulated patients as well as traditional methods. Simulated patients have proved to be an excellent means of evaluating affective skills which are not easily tested by other techniques.

Before the initiation of the simulated patient program in the Department of Family Practice at Southern Illinois University, students were evaluated using multiple choice questions in conjunction with faculty and resident observation. Dissatisfaction was expressed with this system because it did not adequately evaluate affective performance. Consequently, a search for alternative methods of testing was begun.

A number of programs in the United States and Canada are using simulated patients as a teaching and evaluation tool.[1-3] As an evaluation tool the simulated patient technique has been used extensively by the College of Family Physicians of Canada which combines it with multiple choice questions, patient management problems, and counseling videotape evaluations to form the Canadian Certification Examination.[4] A personal experience with this examination by one of the authors (P.G.C.) prompted the development of a similar but simplified program at Southern Illinois University School of Medicine. This evaluation program is used at the end of the required four-week family practice clerkship at Southern Illinois University. At present the clerkship receives six students for each rotation; one half-day is set aside at the end of the clerkship for an evaluation using simulated patients.

Method

A. Locating Simulated Patients

Difficulty had been expected in locating suitable subjects for training as simulated patients, but this has not been the case. Individuals who have had no previous contact with the Family Practice Center are sought, as dealing with a completely unfamiliar individual makes the simulated case more authentic for the student. Local acting groups and university drama departments are good sources of potential simulated patients. The program has used only amateur actors and actresses and has found them satisfactory. Inasmuch as they have usually at some time in their lives been patients, they have little difficulty in adopting the simulated patient role.

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0094-3509/80/020259-07$01.75

The applicants are screened in an attempt to select individuals suitable for each case and, to a certain extent, the case is tailored to fit the actor or actress. Individuals who have a medical history which resembles the simulated problem are avoided. For example, if the simulated patient is to be an alcoholic, an individual who is now or had been an alcoholic would be avoided as a simulator. Individuals who are using the situation to obtain medical advice or help, or those with negative experiences with physicians in the past are also avoided because a personal experience of this nature may bias their approach to the student.

Although at present the pool of actors and actresses is relatively small, it is helpful to keep a file card index recording special characteristics and special acting skills.

Each actor or actress employed is reimbursed for time and expenses on an hourly basis, for time involved in reading the script, rehearsing, and acting the simulated patient role.

B. Constructing the Problem

Students rotate through the clerkship during their first clinical year and are therefore at different stages of clinical sophistication depending on rotations previously completed. In the early clinical months relatively straightforward medical problems are used. One case presented a young female patient on oral contraceptives who had recently developed migraine headaches. Later in the year more sophisticated problems are used involving medical and psychosocial elements. For example, a case involving an infertile couple was developed in which the wife had vaginismus and the marriage had not yet been consummated.

The problem is written by a faculty member and is usually based on a real-life patient with modifications in the history to protect confidentiality. Once completed, the final case may be an amalgam of several patients who have been seen with the same diagnosis.

A difficult part of the construction of a problem is instilling the patient profile with enough local color to give it an authentic ring. This has been overcome by obtaining biographic details from people who have been long-time residents in the area.

C. Patient Profile and History

An outline of the patient profile and medical history are constructed and from this information the patient's problems are defined. Then, using the basic outline, an information sheet containing a detailed patient profile and the medical history for the simulated patient is developed. The following is an example.

I. History

Anna Nerone is a 32-year-old married woman with no children. She has been married for five years to an insurance salesman and works as a secretary for one of the state offices. Her marriage was happy until about eight months ago when her husband started having an affair with a single woman who works at his office. He left home in the last week to live with the other woman and has indicated that he wants a divorce.

Mrs. Nerone's parents and sisters live in Pennsylvania and her brother lives in Texas. Her husband's parents, however, live in Springfield, but her relationship with them has always been rocky. They have been nonsupportive and have made it clear that they do not wish to communicate with her about the situation.

She is very unhappy, and has been crying a good deal both at home and at the office. She has become touchy, easily agitated, and very sensitive. Her co-workers have encouraged her to go to the doctor because they feel she is "worrying herself sick."

Family History—Father, aged 56, mother, aged 55, both in good health. Two sisters, 25 and 30, and a 28-year-old brother also all in good health. There is no family history of tuberculosis, diabetes, hypertension, or any malignant disease. Her husband is in good health.

Recent History—Mrs. Nerone is indeed touchy; she is nervous, and visibly trying to control herself. She is frank with the doctor about the home situation and indicates that her friends have urged her to come in. She has lost about 8 pounds although her appetite is good, she has noticed that her heart beats fast, she has had some diarrhea recently, and she has begun smoking two packs of cigarettes a day. (She started smoking since the affair, but her intake has increased since her husband left home.) In addition, she has a good deal of

trouble getting to sleep and lies awake for "hours." She also wakes early in the morning and it takes her half an hour or so to get back to sleep.

Mrs. Nerone states that she loves her husband, and while she knows of the affair, cannot believe that he would leave her. (They were planning to start a family next year.) She is not sure what to do—whether to keep her house and job, see if she can get her husband back, or sell the house, quit, and return to Pennsylvania to be with her family.

Her dilemma is complicated somewhat because she missed her last period and they have always been regular. On direct questioning she admits to "feeling warm all the time, can't get cool, sweating a good deal."

Any relevant past history and family history is also noted and the systems review is outlined. The actor or actress is asked to improvise from their own medical or personal history as appropriate, to fill in any of the gaps left in the simulated patient information.

A brief resume of past history is prepared as an introduction for the student. The resume contains details of the patient's past history which a family physician might be expected to obtain from the patient's chart or to remember if he knows the patient well. For the above case the introduction sheet is as follows:

"Anna Nerone is a 32-year-old female who presents in your office because she feels tense and anxious and has difficulty getting to sleep at night. She is married, but her husband has not attended your office in recent months. They have no children.

In reviewing her records you find the following:

Family History—Father aged 56, mother 55, live in Pennsylvania. Both are in good health. Two sisters, 25 and 30, and a 28-year-old brother also all in good health.

Past Medical History—Largely uneventful. Measles, mumps, rubella in childhood, as well as a fractured radius and left elbow at age 6. Appendicitis at age 10. No other illnesses or operations. No allergies."

II. Physical Examination

Physical examination findings are discussed in detail by the faculty constructing the problem and pertinent positive and negative findings are listed. For the case cited the list contains the following positive findings:

1. The patient is "as you see her."
2. Skin—warm and moist.
3. Eyes—lid lag on downward gaze.
4. Tendon reflexes—hyperactive equally on both sides.
5. Thyroid—uniform smooth enlargement.
6. Fine tremor of fingers with outstretched hands.

III. Problem List

A problem list is also developed and for this simulated patient contained the following problems.

1. Anxiety
2. Marital discord
3. Tachycardia
4. Reactive depression
5. Loss of weight
6. Smoking

Other past medical problems and family problems detailed in the history and physical examination would also be included here.

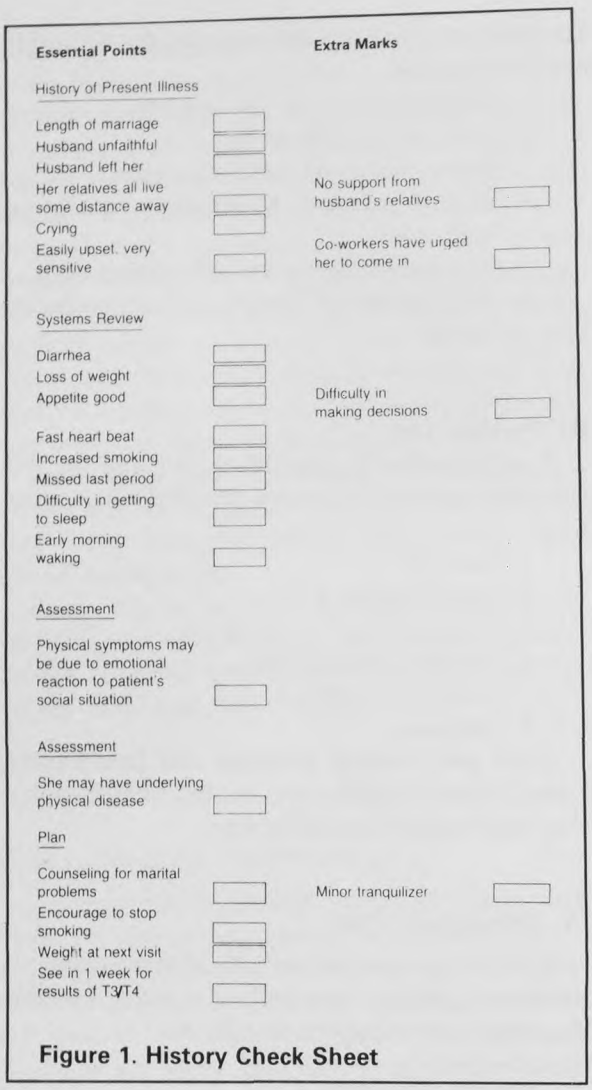
IV. Management Plan

A list of appropriate methods of management is developed and this may include a list of possible diagnostic investigations or referrals.

Diagnostics
Weight at next visit
See in 1 week for results of T_3/T_4
Treatment
Counseling for marital problems
Minor tranquilizer
Patient Education
Encourage to stop smoking

The history, physical examination, problem list, and management plan evaluation sheets use a check box system. For each case the basic facts which the student should obtain are listed on the check sheet. An additional column contains facts which might be obtained by a more sophisticated student and which would generate extra marks.

As an arbitrary level it was felt that the student should be expected to obtain two thirds of the basic facts in each case. An example of the check sheet for the case quoted is given (Figure 1).



Essential Points

History of Present Illness

- Length of marriage
- Husband unfaithful
- Husband left her
- Her relatives all live some distance away
- Crying
- Easily upset, very sensitive

Systems Review

- Diarrhea
- Loss of weight
- Appetite good
- Fast heart beat
- Increased smoking
- Missed last period
- Difficulty in getting to sleep
- Early morning waking

Assessment

- Physical symptoms may be due to emotional reaction to patient's social situation

Assessment

- She may have underlying physical disease

Plan

- Counseling for marital problems
- Encourage to stop smoking
- Weight at next visit
- See in 1 week for results of T3/T4

Extra Marks

- No support from husband's relatives
- Co-workers have urged her to come in
- Difficulty in making decisions
- Minor tranquilizer

Figure 1. History Check Sheet

V. Affective Rating Form

A rating form for affective performance was developed since a satisfactory form already in use elsewhere was not located (Figure 2). It divides the interview into three sections looking at the physician/patient relationship. The introduction to the interview was considered crucial as putting the patient at ease at the beginning facilitates the amount of information obtained. Evaluation of the middle of the interview concentrates on information gathering and, in particular, appropriate rate and style of questioning. Good eye contact, good listening ability, and good nonverbal communications are also noted. The end of the interview is evaluated for the student's ability to explain the management plan to the patient in terms the patient can understand, to enlist the patient's cooperation, and to terminate the interview smoothly. A five-point marking system is used.

D. Training the Simulated Patient

The training program involves a discussion with the actor or actress a few days before the evaluation. A member of the faculty will describe the simulated patient in detail, going over the patient profile and personality of the patient involved and describing each point in the history. Variations in history taking techniques are anticipated by giving a comprehensive description in lay terms of the kinds of symptoms produced by the medical illness and also of the reaction produced by the simulated patient's personality. Prior to the training session the actor or actress is given the history to read. The training session takes place no more than a day or two before the examination so that the situation is fresh in the mind of the simulator. Initially, there will be questions on aspects of the medical history and these are discussed in detail by the faculty member. The case is then subjected to a trial run in which one of the faculty members takes the history from the actor or actress. That performance is discussed and the process repeated. The simulators are also instructed in the use of the affective rating form. The training session lasts approximately $1^1/_2$ hours.

E. Conducting the Examination

The students know that the patients are simulated and this helps to relieve some of the stress of the examination. They are also informed that a physical examination is not generally required. The time allotted for each student is approximately 45 minutes. With an average of six students on the clerkship and using two teams of faculty and simulated patients, the evaluation and feedback may be conducted in one half-day. The

	Superior 5	4	Competent 3	2	Needs Improvement 1
A. Opening					
1. Introduces himself					
2. Makes patient feel comfortable					
3. Shows personal interest and concern					
4. Smooth transition to medical history					
B. Middle					
1. Proceeds from general to specific questions					
2. Good rate and pace					
3. Facilitates exchange of information					
4. Systematic approach					
5. Shows consideration for patient's condition and feelings					
6. Sits in appropriate position in room					
7. Listens well					
8. Establishes eye contact					
9. Notes patient's nonverbal communication					
10. Makes appropriate nonverbal communications himself					
11. Behaves in a supportive manner					
12. Appears comfortable in physician role					
C. Close					
1. Summarizes well					
2. Appropriate explanation of findings					
3. Appropriate explanation of management plan					
4. Involves patient in plan					
5. Patient education					
6. Gives opportunity for questions or further information					
7. Leaves patient feeling comfortable					

Figure 2. Student Rating Form: Method and Performance Evaluation for Clinical Simulations

facilities of the Family Practice Center, which is familiar to students, are used. They are placed in examination rooms which are equipped for videotaping and since the facilities are already familiar to them, the examination becomes a less stressful experience.

The observers usually consist of one physician from the Department of Family Practice and a member of the Department of Educational Resources who is familiar with programmed patients. Each physician observer evaluates the performance of each student using the check sheets described.

At the beginning of each session the student is given the brief chart resume and is allowed a few minutes to read it and ask questions. The student is then asked to interview the simulated patient for 20 minutes and take an appropriate history.

The interview is recorded on videotape for discussion later and the observing faculty note the quality of the student's performance on the check sheets, looking for the medical content of the interview and interviewing skill.

At the end of the history the student leaves the room to discuss the history with the physician. The student is asked to talk through the physical examination which he feels appropriate for the case and is encouraged to ask for specific physical findings. Immediate feedback is given by the faculty member on physical signs and the results of any office laboratory tests requested. Investigations which are not available immediately in the office may be requested but the results are not given. Armed with the information on physical findings and laboratory tests obtained by discussion with the faculty member, the student is asked to go back into the room and explain his/her management plan to the patient. The student is expected to manage the patient exactly as the problem is perceived; differential diagnosis is not discussed at this point.

The actor or actress is generally not trained to simulate physical signs. This is a more difficult area for training and adds unnecessary length to the examination. Affective performance and problem solving can be adequately judged without observing a physical examination of the simulated patient.

The student's performance in explaining his management plan including patient education, consideration of socioeconomic aspects, and admission and discharge planning, is assessed and rated on the check sheet developed for each problem.

As the check sheet is being used, the affective rating form is also being completed, and at the end of the examination a copy of this rating form is also given to the simulated patient for a subjective opinion.

At the completion of the case, the check sheets and rating forms are handed to the student for perusal and later discussion.

F. The Evaluation Session

When the simulated patient interview has been completed, the entire group assembles for a discussion of the case. Each student is offered the opportunity of reviewing his own videotape either individually or with a faculty member. In the case of a substandard interview, review with a faculty member is routine.

The group discussion following the examination gives immediate feedback on errors in patient management, physician-patient relationship, and diagnosis so that it also becomes a valuable learning experience for the student.[5] Not only does learning result from discussion of the case with faculty but also from comments and criticisms made by peers. In addition, it gives the faculty feedback on inconsistencies in the case. Minor inconsistencies often occur during the first use of a case but these can be corrected before the same problem is used again.

Results

The following data report results from the first nine months of the program (n=55). For all the cases used, the mean percentages of basic facts identified in the clinical sections are as follows:

History of present illness	75.4%
Social history	58.8%
Family history	43.4%
Past history	72.3%
Physical examination	67.6%
Problem list	56.7%
Plan	62.1%

It is of interest that despite instructing the students to look for psychosocial factors, the social history is often missed. Breaking the social history figures down further revealed that "job description" was asked by 75.3 percent of students, but other social factors received less attention (41.8 percent). It could be that the simulation of an episodic visit may account for less attention to social and family history since these are not generally perceived by the student as being part of the format of an episodic encounter.

From the affective rating forms the following breakdown of results was obtained.

Grade 5	22.0 %	Superior
4	39.25%	
3	31.2 %	
2	6.7 %	
1	0.85%	Needs improvement

Discussion

The students are oriented to the clerkship and the examination at the beginning of the four-week block of time. They become familiar with the use of simulated patients during the clerkship since they are also used for teaching as part of the behavioral science curriculum. Prior to the examination the students voice a good deal of concern about the examination itself but after the examination during the brief wrap-up session most students have expressed satisfaction with both the simulated case and the examination rating system used. In two particular cases major inconsistencies were uncovered and these were corrected before the cases were used again.

The use of simulated patients is one of the few techniques available to test affective performance. It is inexpensive and not too time consuming. It provides more reproducible interviews than using real patients, and certainly does not subject sick patients to prolonged examination by a number of students.

A main disadvantage lies in the possibility that the students might not take the examination seriously since they are not dealing with real patients. This has not been the case to date since the examination is conducted in the environment in which students normally see patients, the actors and actresses have so far been of high quality, and the videotape equipment is unobtrusive. The initial time commitment is considerable, but once a library of cases has been developed, the program requires only a short time to train the simulated patient and examine the students. Some direct method of observation is necessary. Either a one-way mirror or, preferably, videotape equipment should be available.

The technique has been so successful that it has been extended to the undergraduate teaching program where simulated patients are used in the behavioral science curriculum to teach students how to deal with different personality types presenting with medical problems. It could also be extended to quite sophisticated problems for use in the residency program. Residents who need development of certain skills or who need practice in dealing with difficult situations, such as unexpected bereavement or difficult patients, might find an experience with simulated patients very beneficial.

It seems to be an effective method of evaluating clinical sophistication and affective performance. While realizing that there could be difficulties in adopting this method of examination for large programs, it could still prove useful as an individual learning and evaluation tool for students with deficiencies in interpersonal skills or problem solving.

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