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# Simulated Patients in Medical Teaching

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MOCK warfare, mock trials and aircraft trainers are but a few examples of simulation used to teach, evaluate and provide practical experience for the student before he is ready to assume full responsibility. Simulated teaching is controlled, the student's experience is free of unexpected or unknown variables, and his responses or actions can be recorded and evaluated relative to performances by other students and the goals of the teacher. Over the past three years we have developed patient simulation in many areas of medical education to teach and evaluate clinical performance by the student. To teach patient care is the stated goal of our medical school and certainly a goal implied in the M.D. degree. Despite this, it is amazing how few means are available in medical education to appraise accurately the performance of a physician-to-be at the bedside and to teach clinical medicine in a simulated or controlled situation that provides experience dictated by the teacher.

For patient simulation we use persons who have been specially trained and oriented to perform as patients. In many instances this requires that they should give a history and simulate the clinical findings of a patient with a particular disease entity.

## ADVANTAGES OF THE SIMULATED PATIENT

The simulated patient has the following advantages over the use of real patients in the teaching situation:

1. The student can practise examination technique on simulated patients without the embarrassment a neophyte feels in front of ill patients and without concern for tiring them, hurting them, or aggravating their illness.

2. The simulated patient can be examined over and over until the student's technique is sure and satisfactory to the instructor and himself.

3. All necessary aspects of disease complications and prognosis can be freely discussed in front of the simulated patients without concern for their reaction to such information.

4. Real patients who are used for clinical teaching are relieved of being subjects for teaching skills unrelated to their illness, its care and evaluation.

5. A clinical problem can be presented to a student in which all the findings can be predetermined, allowing for careful evaluation of the student's clinical ability.

6. The same clinical problem can be presented again and again to different students, allowing for inter-student comparison and for evaluation of the effectiveness of the teaching program.

7. A trained simulated patient can report objectively on the student physician's skills, physician-patient rapport, manner, approach, etc.

The objection to the simulated patient can be stated as follows: "A fake patient is no substitute for a real patient. All clinical teaching should be based on real patients." This objection ignores the fact that the simulated patient can occupy an intermediate position between texts, lectures, protocols, slides and movie films on the one hand and a real patient on the other. He or she is a real, living, reacting human on whom the student can sharpen and perfect his clinical skills and be evaluated for his ability to perform in the clinical arena.

## TRAINING OF THE SIMULATED PATIENTS

The details of the training of simulated patients will not be included here, since they have been described elsewhere.[2] Basically the training program consists of any or all of the following steps, depending on the specific use of the simulated patient:

1. Orientation to the clinical setting and the simulated patient technique (films and demonstrations are utilized in this phase).

2. Employment as subjects in class demonstrations of anatomy, examination techniques, etc.

3. Observation, by simulated patients, of real patients being interviewed and examined, especially patients showing phenomena to be presented by the simulated patient.

4. Teaching the simulated patients to make a real patient's clinical problem their own. They learn the patient's experience with the disease

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process and how to simulate the findings expected in a patient.

5. Coaching the simulated patient to behave in the interview and at examination as a patient (for this phase we now use an experienced patient simulator who is a professional actress).

6. Independent evaluation and critique of a trained simulated patient's performance by a member of the teaching faculty who has had no contact with the training program.

## PRESENT USES OF THE SIMULATED PATIENT

### A. *Laboratory in Living Anatomy*[1]

The anatomy that should be taught to freshmen is living anatomy. It is important to have the student apply the information he learns from the cadaver to the living human body. At the end of each major section in gross anatomy, e.g. the thorax, abdomen, extremities, etc., the students spend time in a clinic-laboratory where the simulated patient can be examined, under faculty supervision, for bony landmarks, musculature, tendinous insertions, palpable organs, vessels and glands. They can perform skin mapping of underlying viscera and observe functional phenomena related to anatomical structure, e.g., joint motion, muscle action, respiratory and cardiovascular movements. In this manner the students correlate cadaver information to a living subject. In this contact with disrobed simulated patients the student can overcome any embarrassment and concern from such an encounter early in his career, so that objective attitudes can be developed, allowing the student to learn more effectively from subsequent patient encounters. This clinic-laboratory has gained enthusiastic acceptance by all students and faculty concerned.

### B. *Teaching Clinical Neurology in Remote Areas*

The Neurology Department was able to present a series of 10 workshops in neurology as part of a postgraduate course offered to physicians in a resort hotel in Hawaii where it would have been impossible to find real patients. In all these workshops, covering the gamut of important neurological conditions, one simulated patient was used. She simulated 13 different neurological patient problems. Her simulations were based on actual cases, selected for their teaching value from the departmental files. Despite the holiday atmosphere, her presence in bed in a patient gown brought the physicians' minds to bear on clinical medicine more effectively than slides, films or protocols could have done. As on bedside rounds, her case history was recited by a faculty member and then a member of the student group was asked to examine the patient for the group. His approach was observed and commented on by the student group and faculty, producing group participation in a truly workshop situation. The simulated patient effectively enacted coma, seizures, paralysis, sensory losses, reflex changes, blindness, etc., as required in patients she was simulating. Physician after physician in this workshop commented on the realism of her performance and how easily they forgot that she was not a real patient. Phenomena that cannot be simulated—papilledema, atrophy, fasciculation, etc.—are described and the examining physician is asked to assume their presence. However, this was rarely necessary. The actual electroencephalogram, radiographs, electromyogram and laboratory data of the patients simulated were given to the group as requested. In this manner broad clinical instruction can be offered to any group in any remote area, using only one simulated patient and one instructor. Even in areas where patients are available such a variety of illustrative problems is not likely to be found.

### C. *Evaluation of Clinical Neurological Performance*[2]

In the clinical clerkship in neurology our goals are to teach third-year medical students to perform a neurological examination, synthesize their findings into a logical concept of altered neuroanatomy or neurophysiology, arrive at a logical impression of etiology and differential diagnosis, and survey the case as a whole, utilizing laboratory and diagnostic procedures. Quizzes, oral or written, do not test these goals. Reporting the results of a real patient examination does not permit evaluation of the student's technique or comparison between students, since they all cannot examine the same patient. This type of test is fraught with variables in terms of the responses of a particular patient at any given time. The simulated patient can present a repeatable history, in the manner of a real patient, and repeatable neurological findings based on those of an actual patient. In addition, this simulated patient, especially trained, can subsequently report on the details of the student's examination technique and bedside manner. This method, used over the past three years, has proved to be an effective means for the evaluation of clinical performance and has provided the individual student with valuable insight into errors in his technique, manner and knowledge of neurology that could not have been obtained otherwise.

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Again, many students described how easily they forgot this was not a real patient they were examining, as testimony to the realism of this procedure.

D. *Workshop in the Neurological Examination*

Here the simulated patient is used as a subject for demonstration and practice of techniques in the neurological examination in a small workshop consisting of a faculty member and a few students. After demonstrations by the faculty member the student can work out his examination technique before he has to face the real patient. The consequences of neurological disease and significance of neurological findings can be freely discussed by the faculty, and the simulated patient can be examined and reexamined without concern for his welfare or reaction, since he is hired to be a subject.

E. *Demonstration of Basic Neurological and Neurosurgical Principles*

As an extension of the workshop technique, the simulated patient is used in larger medical school classes to demonstrate principles and techniques used in evaluating patients in coma, with seizures, aphasia, back pain, etc.

F. *Other Uses*

Based on the advantages of simulated patients over real patients in teaching, there have been many other ways in which their services have been used. The psychiatry department utilized a simulated patient to prepare teaching tapes on the psychiatric interview. They have been used in the preparation of several films and educational television shows by many different departments. In one television show the simulation was so convincing that many clinicians in the audience felt they were watching a real patient with an aphasia and hemiparesis, despite a final credit mentioning the patient simulation. Here a patient was spared agonizing hours under hot lights with rehearsals and repeats; yet the audience had the illusion that they were actively involved in an acute medical problem. The simulated patient has been utilized recently as an evaluation technique for a clinical teaching innovation by offering the same test to paired experimental and control groups of students.

REFERENCES

1. BARROWS, H. S., PATEK, P. R. AND ABRAHAMSON, S.: The introduction of the living human body in freshman gross anatomy. Accepted for publication in the *British Journal of Medical Education.*
2. BARROWS, H. S. AND ABRAHAMSON, S.: *J. Med. Educ.*, 39: 802, 1964.