CLINICAL TEACHING

Thomas L. Schwenk

Clinical teaching is a form of interpersonal communication between two people - a teacher and a learner. "The teaching-learning process is a human transaction involving the teacher, learner and learning group in a set of dynamic interrelationships. Teaching is a human relational problem" (Bradford 1958, p. 135). As a "relational problem," successful teaching and learning requires that the teacher understand and make constructive use of four factors:

1. The role of the teacher and the knowledge, attitudes and skills that the teacher brings to the relationship,
2. The role of the learners and the experiences and knowledge that the learners bring to the relationship,
3. The conditions or external influences which enhance the teaching-learning process, and,
4. The types of interactions which occur between teacher and learner.

This paper will describe some features of each of these factors, and then offer an example of the specific application of these factors to a common format of medical teaching: bedside teaching.

The Role of the Teacher

Many medical educators think that the only role of the teacher is to be a reservoir of knowledge and skills that occasionally, and unpredictably, spills over its dam, letting information flow randomly down a canyon of learning. However, W. J. McKeachie, U-M Professor of Psychology and former Director of CRLT, has often emphasized that expertise alone is not enough for good teaching. In mathematical parlance, knowledge and expertise are necessary, but not sufficient, conditions to guarantee good teaching.

Clinical teachers should realize that they assume multiple roles in their interactions with their students. Ullian (1986) has reviewed 16 of the most significant studies of perceptions of excellent clinical teaching. He found that factor analysis groups most behaviors and characteristics of excellent clinical teachers into four roles: Physician,Teacher, Supervisor, and Person.

The *Physician* is the expert and the source of all knowledge. There is considerable discrepancy between the Physician's level of experience and wisdom and that of the students. This discrepancy is the reason the medical teacher and students are together. The physician is also responsible to school administrators, specialty boards and hospital credentials committees for evaluating and certifying the competency of students. The physician is the upholder of professional standards and is a socializing agent, a member of a professional discipline.

Thomas L. Schwenk, M.D., is Associate Professor in the Department of Family Practice at the University of Michigan Medical School. A more extensive presentation of his thoughts on clinical teaching can be found in the recent publication Schwenk, T.L. & Whitman, N. The Physician As Teacher. 1987. Williams & Wilkins.

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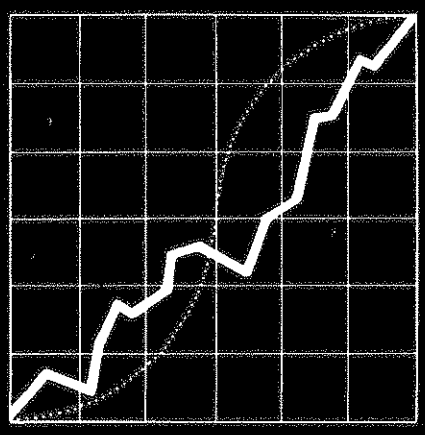


As a *Teacher*, the medical educator is acutely aware of the needs and aspirations of students but does not automatically assume it will be possible to provide them everything they need. The Teacher can listen, question, paraphrase, encourage or doubt students but cannot always provide for them.

As a *Supervisor*, the medical educator demonstrates procedures, provides practice, observes and assesses performance and provides feedback.

Finally, as a *Person*, the educator develops an atmosphere of sufficient trust that the students are comfortable sharing ideas, feelings and thoughts. The physician-educator does not necessarily have to like the students but does need to accept their needs and imperfections. The Person may provide significant personal help and support outside the formal teaching setting.

The Role of the Learner

What do learners bring to the relationship? Bradford (1958) notes that learners are usually loaded with all sorts of anxieties, needs, problems and screens that interfere with learning. How secure is the learner in the situation and group? "Does he perceive the teacher as capable of understanding and helping him? To what extent does he even recognize the kinds of help he would most appreciate as well as most need?" (p. 136). How motivated is the learner to learn, to risk old ideas and knowledge for the sake of new? To what extent is self-esteem or self-image threatened by the learning process?

Mann et al. (1970) have described eight general types of students. The five types most applicable to medical students and residents are:

1. ***The Compliant Students*** - These are the typical "good" learners who work hard, are task-oriented, show little emotional turmoil, and are primarily concerned with understanding the material and complying with teacher requests.

2. ***The Anxious Dependent Students*** - This is often a predominant type in medical school, dependent on the teacher for knowledge and support and anxious about evaluation. The feelings of anxiety and incompetence block these students from actively learning and make them more concerned about grades. They are difficult to engage in discussion, and prefer lectures.

3. ***The Independent Students*** - These learners are often older than counterparts and seem confident and unthreatened by the teacher. They favor peer relationships with the teacher and approach the material in calm, objective, and often creative ways. Medical students with previous graduate work and chief residents often fall into this category.

4. ***The Sniper Students*** - These learners are uninvolved due to a low level of self-esteem and pessimism about being able to form productive relationships with authority figures. They can be hostile, but are often elusive when confronted with a particular issue.

5. ***The Silent Students*** - These learners are characterized by what they do not do. They feel helpless and vulnerable, but without the anxiety characterizing the anxious-dependent learners.

Learners bring startlingly different needs and agendas to their interaction with teachers, just as do patients to their medical encounters. Teachers cannot be all things to all learners, just as physicians cannot care effectively for patients of all personality types. However, awareness of different types of learners, and adjustment of the teacher's style insofar as is possible, will be helpful.

Conditions for Effective Learning

Medical students and residents are adult learners, and medical education should follow the principles of adult learning. Unfortunately, this does not always happen. Medical learners are certainly adults chronologically, and they are pursuing a very difficult field of study requiring discipline and maturity. Unfortunately, many of the basic assumptions underlying current medical education would be recognizable to an elementary school teacher. In any case, medical education is, or should be, an adult learning process. What are the principles that enhance the teacher-learner relationship? There are four:

1. ***Adults usually want to apply what they learn soon after they learn it.*** This rule is broken somewhat less in clinical teaching than in other areas of medical education. However, clinical teachers should always feel compelled to justify any clinical teaching that cannot be shown to have some, albeit small or indirect, application to a relevant patient problem or clinical situation.

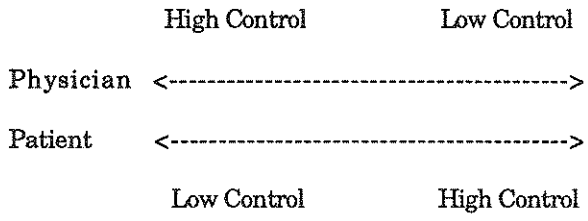
2. ***Adults are interested in learning concepts and principles; they like to solve problems rather than just learn facts.*** This issue has been recently addressed in the Report of the Panel on the General Professional Education of the Physician (the GPEP Report, 1984). Medical education suffers terribly under the weight of unrelated, and often relatively useless, facts. As medical knowledge expands, so does the density of the medical education process, often to the detriment of the problem-solving and clinical reasoning skills of future physicians. Clinical teachers, by emphasizing use, rather than mere retention, of facts will not contribute to what is already recognized as a major problem by national authorities.

3. ***Adults like to participate actively in the learning process by helping to set appropriate learning objectives.*** How can students and residents possibly know what they need to know? The teacher, of course, possesses considerable knowledge and experience that learners do not. However, the teacher should negotiate with learners regarding appropriate educational objectives, given certain needs, resources, and overall goals. This has a remarkably positive effect on learner motivation!

4. ***Adults like to know how well they are doing; feedback should help them evaluate their own progress.*** Feedback for the sake of improving performance is called formative evaluation. Medical education offers numerous opportunities for making decisions about competence, promotion or advancement, called summative evaluation (Scriven, 1967). However, clinical teachers have a critical role to play in making comments, particularly negative ones, that will help a learner change a professional behavior, make a better decision or perform a skill more precisely. These pieces of personal, well-intentioned feedback are the critical elements for cementing a teacher-learner relationship and bringing closure to the learning process.

The Interaction Between Clinical Teacher and Student

The physician-patient relationship has been characterized as a continuum with two complementary control scales along which physicians and patients move at equal rates and in the same directions. The conceptual model for this is diagrammed as follows:



As the physician moves from left to right and uses interviewing and communication behaviors that are less and less assertive or controlling, the patient would move from left to right with opposite results. An example of a situation to the far right of the scales would be a traditional psychoanalytic relationship in which the patient takes almost total responsibility for the outcome of the interaction and receives little or no feedback or comment from the psychiatrist.

The interactions between teacher and student can be characterized in a similar manner. A high degree of control and activity on the part of a teacher calls for a relatively passive role for the learner and vice-versa.

Communication Skills. The clinical teacher, then, can be seen as drawing upon a broad range of communication skills and behaviors, choosing the specific technique that is appropriate to the particular situation. The necessary repertoire of communication skills ranges from a group that might be labelled "Attentive Silence" for the passive teacher stance, to a group labelled "Cooperative Negotiation" when teacher and learner take a fairly equal stance, to a group labelled "Persuasive Confrontation" when the teacher takes an active and controlling stance in the relationship. The full range of skills are described here briefly:

1. ***Attentive Silence*** - which communicates that the teacher is paying attention and gives the learner time to think,

2. ***Observation*** - which gives the teacher behavioral and nonverbal data about the learner,

3. ***Purposeful Eye Contact*** - to engage learners who require special teacher attention,

4. ***Tracking*** - the "nods and grunts" that indicate understanding and general approval,

5. ***Open-Ended Encouragement and Advocacy*** - to provide a supportive, although not completely anxiety-free, learning environment,

6. ***Surface Paraphrasing and Exploration*** - to help the teacher gain additional general information from the learner,

7. ***Self-disclosure*** - to strengthen the teacher's image and credibility by revealing personal experiences, "war stories," difficult cases and mistakes,

8. ***Active Listening*** - to probe the learner's thinking for purposes of clarification, expansion, justification, and correlation,

9. ***Intense Paraphrasing*** - which allows the teacher to more aggressively question the learner for specific information or for specific responses,

10. ***Open-Ended Questioning*** - to expand the discussion and to stimulate the learner to consider several choices,

11. ***Giving Positive and Negative Feedback*** - which allows the teacher to give negative information in such a way that the learner can improve future performance,

12. ***Summarizing and Interpreting*** - for the teacher to take control of a discussion and add appropriate emphasis, clarity and emotional punctuation,

13. ***Information Giving and Prescribing*** - in which the teacher as Expert transmits knowledge directly to the learner,

14. ***Critiquing, Correcting and Closed Questioning*** - to provide the learner with summative evaluations (see above) and to examine a learner's knowledge in a focussed and convergent style, and

15. ***Persuasion, Challenge and Confrontation*** - which allows the teacher, in the most active and assertive way possible, to challenge old knowledge and attitudes for the purpose of persuading the student to adopt new knowledge and attitudes.

Objectives of Bedside Teaching

The general concepts of clinical teaching described above can be applied to any clinical teaching format, from journal clubs to morning report and teaching rounds. This paper will close with some suggestions for how to improve an important but often neglected form of clinical teaching: bedside teaching.

There are four fundamental objectives of any bedside teaching interaction:

1. base all teaching on data generated by or about the patient;
2. conduct bedside rounds with respect for the patient's comfort and dignity;
3. use bedside teaching particularly for teaching psychomotor skills; and
4. use every opportunity in bedside teaching to provide feedback to learners.

Bedside teaching has as its foremost objective the *teaching of knowledge, attitudes, and skills related directly to the patient* who is present. Although over 300 years old, the advice of Sylvius, the 17th Century Chair of Medicine at Leiden, is still valid regarding the focus of bedside teaching. "My method . . . (is to) lead my students by the hand to the practice of medicine, taking them every day to see patients in the public hospital, that they may hear the patient's symptoms and see their physical findings" (Linfors and Neelon, 1980, p. 1231).

In essentially all cases, teaching should focus on history, physical examination findings, or psychomotor skills being taught, or should be used as an opportunity to demonstrate appropriate methods of patient interaction and consideration for the psychosocial aspects of patient care. Hurst notes that "the time physicians and students spend with patients should be devoted entirely to the patient. Each patient is unique, and what each says and reveals must be listened to and studied carefully" (Hurst, 1971, p. 464).

The second objective of *conducting bedside teaching with respect for the patient's comfort and dignity* has benefit for both patient and learners. For the patient, bedside rounds can be an opportunity for the attending physician to publicly (as opposed to privately with only the patient) demonstrate his concern for the patient's emotional state and to empathize with the anxiety and distress felt by the patient regarding his medical situation. Romano notes that "ward round teaching, when conducted tactfully and sympathetically . . . is not a traumatic emotional experience to patients, but educates and reassures them" (1941, p. 667). Linfors and Neelon found that 95 percent of patients saw bedside rounds as a positive experience (1980).

The psychosocial aspects of patient care are so complex that the only way and place that they may be taught is by the teacher demonstrating psychosocial techniques of interaction while learners observe directly. To tell a student or resident how to demonstrate concern and caring is fruitless. A resident commented, as part of a study of effective attending physician teaching behaviors, on the critical contribution made by one attending physician through his example. "He has this very deep concern for people's total well-being: physical, emotional, psychological, and spiritual. It is something that you have, and can develop, but it can't be taught except by example" (Mattern et al., 1983, p. 1131).

Bedside teaching is also a critical time for *the teaching of psychomotor skills*. These skills include the usual diagnostic and therapeutic procedures but also include physical examination skills and medical problem solving skills. A mistake often made in teaching clinical problem solving is that it is described and "practiced" in a vacuum - in the absence of the patient whose problem is being solved. The techniques of teaching psychomotor and surgical skills apply as well, and perhaps even better, to the skill of problem solving.

A study by Weiner and Nathanson (1976) shows that students and residents are observed and critiqued performing physical examinations with remarkable infrequency. While the outcome of problem solving is paid considerable attention, the process probably receives as little attention as does the performance of physical examination; the bedside is the perfect, and only, place to rectify both of these educational deficiencies.

One of the important learning objectives of bedside rounds, which cannot be as well achieved by many other teaching formats, is *evaluation by the teacher of the learner*. The giving of feedback, both positive and negative, is a critical part of the bedside teacher's job. Feedback has both formative and summative purposes, and both have value at the bedside. Feedback is only valuable if the knowledge about the learner is detailed and intimate, and the bedside is the best place to obtain it.

Techniques for Bedside Teaching

The techniques useful to the clinician who wants to be a better bedside teacher can be organized according to the four objectives of bedside teaching. The recommended techniques for bedside teaching are as follows:

1. Base all teaching on patient data.

To extend the previous quotation from Sylvius, "I question the students as to what they have noted in the patients and about their thoughts and perceptions regarding the cause of the illnesses and the principles of treatment" (Linfors and Neelon, 1980, p. 1231). Hurst notes that the bulk of the patient presentation should not be made in the presence of the patient, but should adequately prepare the learners to benefit maximally from the time with the patient. (Hurst, 1971, p. 464).

This means that case presentations, either complete or partial, must be made succinctly, that all data bearing on a particular problem be presented together, that not all problems necessarily be discussed, that the presenter make clear an overview of the patient's situation, that the purpose of subsequently visiting the patient be made clear, and that time be allowed for questions between presentation and patient visit so that no confusion or ambiguity persists. Should the discussion or activity waver from a patient-based focus, the attending physician has the choice of concluding that "the point of diminishing returns" has been reached and can bring the bedside teaching to a close or can reassert (publicly) the need to return to the issue at hand: the patient and his immediate care and concerns. This has indirect benefits in demonstrating again and with certainty for the patient his central importance to the teacher's thinking and that of the residents and students.

2. Conduct bedside teaching with concern for the patient's comfort and dignity.

The method of bedside teaching advocated by Sir William Osler in the early 1900's is as applicable now as then. A description by one of his students indicated that Osler "would go to the patient's bed, stand (or sometimes sit in a chair) near the head of the bed at the patient's right side, give him a cheery greeting and, if he were a new patient, ask for his history . . . After it had been commented on . . . and often added to and illuminated by Dr. Osler with accompanying pertinent remarks, the report of the physical examination was called for from the clinical clerk . . . Usually Dr. Osler made some examination himself and demonstrated and discussed patient features, all the time mingling his discussion with remarks and explanations to the patient, so that he would not be mystified or frightened . . . Often, patients whose cases had previously been discussed were passed over quickly, but Dr. Osler never failed to give some bright, cheering words to the patient" (Christian, 1949, pp. 81-82.)

Linfors and Neelon found that 95 percent of patients saw bedside rounds as a positive experience, but that patients had several suggestions for improvement: "They wanted the attending physician to introduce himself, to state the purpose of bedside rounds, and to be sensitive to the need to translate technical terms. They also thought that the patient should receive advance notice of bedside rounds and that rounds should not be so long as to tire the patient" (1980, p. 1231). Hurst notes that the presenter, who should know the patient best, should visit the patient after rounds to clarify misunderstandings and relieve any anxieties created by rounds. Also, Hurst reinforces Osler's technique of leaving the bedside "with an optimistic statement of some sort even if it is no more than stating that the physicians caring for the patient are working diligently on the patient's problems" (1971, p. 1231).

In summary, bedside teaching is both productive for the learners and respectful of the patient if these guidelines are followed:

1. common human courtesy guides the asking of patient permission and the introduction of teacher, learners and the proposed activities,
2. physical examinations and procedures are performed and practiced with appropriate explanation, as a physician would do in normal patient care circumstances,
3. all conversations, information transfer, and technical discussions are made in a way that the patient is included and understands,
4. the patient is actively engaged in a three-way dialogue with the teacher and learners regarding the medical problem-solving process, with conclusions (tentative or firm and so stated) made clear to the patient, and
5. a resident or student sees the patient afterward, perhaps during usual work rounds, to clarify questions, concerns, and misconceptions, and bring the teaching event to a productive close.

3. Use bedside teaching opportunities to demonstrate and practice medical and surgical procedures.

Psychomotor skills have traditionally been learned according to the old surgical dictum, "See one, do one, teach one." With one modification, educational research actually supports this as a valid, if terse, aphorism for the teaching of skills. The modification is to include a bit more emphasis on practice, so that the revised dictum is stated as: "See one, do one, do one more, teach one."

Sequential Steps. Many medical and surgical procedures are actually a series of sequential steps, each of which must be performed correctly and in proper sequence. In order to teach these procedures effectively, it is important that they be broken into their discrete components rather than taught as an indigestible lump.

In *backward chaining*, the last step is demonstrated and practiced first, so as to give learners a sense of the procedure's endpoint and outcome. Each preceding step is then demonstrated and practiced, followed in sequence by the latter steps already learned. This procedure works well for lengthy procedures, the endpoints and outcomes of which are not immediately obvious to learners.

Forward lengthening works just the opposite of backward chaining. The first step is demonstrated and practiced first, and subsequent steps are added until the last step is reached. This method works well for short procedures, such as venipuncture, which have readily apparent outcomes.

Levels of Understanding. Learners progress through four levels of sophistication as they learn new skills (*Personnel Journal*, 1974). Teachers must be aware of the level of sophistication at which a learner is currently functioning and match their teaching to that level. Teaching at a level of understanding that is higher or lower than that of the learner is unproductive, frustrating or both. The four levels of understanding through which learners pass in becoming competent practitioners of a skill are:

1. unconsciously incompetent,
2. consciously incompetent,
3. consciously competent, and
4. unconsciously competent.

Most learners start at Level 1, where they do not even know what they do not know. Most teachers are at Level 4, where they can "do it in their sleep." The teacher must join the learner, since the converse situation is impossible.

For example, in teaching a junior medical student, who is *unconsciously incompetent*, how to draw a venous blood specimen, the teacher would first make the learner aware of the technique's existence, the equipment required, and the indications and contraindications. The learner would then know what he does not know and be *consciously incompetent.*

Proper demonstration and practice on models, fellow learners and patients would allow the learner to see and perform the procedure correctly, albeit with hesitation and anxiety, and thus become *consciously competent.* Hundreds of correct performances later, the learner would be *unconsciously competent.* In moving from Level 1 to Level 4, the learner moves through three phases.

The teacher can use the following 12 steps (which include an example of teaching the skill of venipuncture) to help the learner progress.

Introductory Phase ("See One")

1. State the objective of the skill teaching about to be done, and the specific performance that is expected at the conclusion of the teaching. "The purpose of this session is to teach you how to perform a venipuncture for the obtaining of laboratory blood specimens, and I expect you to perform one venipuncture satisfactorily at the conclusion of the session."

2. Explain the rationale and importance of the skill. "Venipuncture is a common procedure done in hospitals and offices, and you will be asked frequently as medical students to obtain blood for various laboratory tests."

3. Present a description of the necessary equipment and materials and an overview of the skill's basic sequential steps. "The equipment necessary to perform a venipuncture is shown here . . . The first step is to select a site of venous access, such as the antecubital fossa . . . "

4. Explain how each sequential step is done. "The next step is to apply a tourniquet on the upper arm, using this rubber strap or a blood pressure cuff inflated to a pressure between the diastolic and systolic pressure."

5. Demonstrate the entire skill, using the technique of either backward chaining or forward lengthening. "The last step, which I'm performing now, is to apply an absorbent gauze or cotton ball to the site and flex the elbow so as to achieve hemostasis."

The learner has now progressed to Level 2, consciously incompetent, and can proceed to the practice phase.

Practice Phase ("Do One")

6. Give specific instructions on what to practice and how. "I'd like you to begin by choosing a partner, laying out your equipment, and demonstrating to me the vein you will be using for this venipuncture."

7. Observe and practice closely and give frequent brief promptings about how the learner is doing. "The arm should be more extended and the tourniquet a bit tighter."

8. Provide generous quantities of feedback generated by the learner, his peers and the instructor (in that order). "Tell me how you think you did in explaining to the patient what you were about to do."

9. Allow a period of independent practice time. "I'll be out of the room for about 15 minutes and want each of you to perform a complete venipuncture by the time I get back."

10. Certify each student on the entire skill. "Over the next two days, each of you should come and get me to watch you do an entire venipuncture."

The student has now progressed to Level 3, consciously competent, and can move on to the perfecting phase.

Perfecting Phase ("Do One More")

11. Provide precision practice under realistic stress situations. "During the next four weeks of your clerkship, I want you to perform 10 venipunctures needed by your ward team."

12. Prompt and give feedback only rarely. "The last three venipunctures you did seemed to go quite well. I noticed this time that you seemed a bit unsteady in collecting the second tube of blood."

The student has now progressed to Level 4, unconsciously competent, and is able to "teach one."

4. Use bedside teaching as a special opportunity to give learners feedback.

The term "feedback" in an educational setting refers to the process of giving learners information about current performance so that they may improve it in the future. Feedback can be either positive or negative. Positive feedback is given to reinforce good behavior, and negative feedback is used to change bad behavior. It is therefore easy to confuse positive feedback with compliments and negative feedback with criticism.

Generally, neither of these behaviors is pertinent to the use of feedback by physician-teachers. Compliments are aimed at making the receiver feel better, and criticisms are aimed at making the giver feel better; neither is designed to help improve performance. The feedback that teachers should use in medical education is information, judgments or observations that help the student or resident make improvements.

For feedback to be effective, it should be *descriptive* rather than evaluative. For example, during an observed physical examination, a medical student has difficulty using the ophthalmoscope. An evaluative statement by the teacher would be, "You're really clumsy." A better form of feedback would be a descriptive statement such as, "The patient appeared anxious when you were having trouble using the ophthalmoscope."

Descriptive feedback is more helpful because it provides an unambiguous and relatively unarguable point from which to start suggesting ways for improvement.

Second, feedback should be as *specific* as possible. For example, a resident hears a benign systolic ejection murmur in a woman whose father has died of a myocardial infarction. The resident carefully explains the significant differences between the two conditions, and the teacher wishes to comment positively on this behavior. A general statement such as, "I've noticed that you are very sensitive to patient concerns," is a nice compliment but does little to reinforce the resident's specific behavior that was so reassuring to the patient. A more helpful and specific statement would be, "I noticed that when you explained the difference between the patient's benign heart murmur and her father's atherosclerotic heart disease, you seemed to relieve an unspoken concern of hers."

Third, feedback should be *well-timed*, meaning that it should be delivered as soon after the event or behavior as is reasonable and practical. Physician teachers are familiar with the typical evaluation of medical students, which students see months after a course or rotation, when students or residents not only cannot adjust their behavior in response to the feedback but cannot even remember their previous performance. Bedside teaching provides an opportunity to provide timely feedback to learners.

In summary, bedside teaching is some of the most enriching, intimate teaching that a teacher can do. The opportunities for directly demonstrating procedures, directly observing learner skills, and giving immediate substantive feedback to learners are unmatched in other clinical teaching formats. There are specific techniques of bedside teaching, as there are for all teaching formats, that can make it efficient, productive and satisfying.

Conclusion

Clinical teaching is an intense personal and interpersonal experience. Certain rules and principles govern the roles that teachers and learners assume and the ways that they play out these roles together. This educational "drama" is complex and requires considerable enthusiasm and commitment on the part of both teacher and learner. This paper has described certain principles of this intense relationship and described how these principles apply to the specific format of bedside teaching. The principles are equally applicable to inpatient teaching rounds, morning report, and preceptorships and ambulatory teaching.

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