Teaching Behaviors in the Attending-Resident Interaction

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A total of 949 interactions between residents and attending physicians in the ambulatory care center were analyzed in terms of defined categories of teaching behavior by using direct observation and the interactional analysis technique of educational research. Results showed that an interaction reflects team problem solving as the predominant teaching mode with the interaction being for the most part directed at the problems of the current patient. Hypothetical situations that broadened the discussion occurred in less than 20 percent of the interactions, and the attending physician rather than the resident virtually always initiated those teaching opportunities. Questioning and verbal expressions of positive, reinforcing behavior were used less often than might have been expected. Problems and opportunities in superimposing teaching goals upon an ambulatory clinical setting are explored in the discussion.

Daggett et al[1] reviewed 100 studies in clinical teaching and concluded that few analyzed how supervisors actually teach or described what occurs during the process. Although their concern was teaching medical students on ward rounds, similar deficiencies might be cited about the process of teaching resident physicians. In family practice training, in particular, an important share of teaching opportunities arises in the ambulatory setting when the resident and attending physician discuss the care of individual patients.

The data for this paper result from systematic observation of 949 such interactions recorded over an eight-month period in one family practice training program. The resident-attending physician interaction will be described within a framework drawn from several prior studies of clinical teaching, and the teaching behaviors actually observed during those interactions will be documented.

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Teaching in the Ambulatory Center

The basic scenario is familiar. The family practice resident sees an ambulatory patient, and in the

course of obtaining the history or during the physical examination, problems may arise that the resident wants to discuss with the attending physician. Sometimes program guidelines dictate that an attending physician-resident interaction occur under specified circumstances. After a private discussion, the resident or the attending physician or both return to the patient.

This interaction, called a "consultation" here, may have multiple functions including supervisory and quality control. However, the consultation clearly can represent an educational dialogue between the resident (a learner as well as a practitioner) and the attending physician (a teacher as well as a more experienced physician-consultant) about the care of a patient currently being seen by the resident. Although these consultations constitute a presumably useful method of teaching in family practice, little quantitative information has been developed to describe the process.

In theory Byrne and Cohen[2] suggested that there are ten possible learning modes: instructed, practice, team problem solving, inquiry, question and answer, self, modeling, trial and error, didactic, and observation. From this list, team problem solving, question and answer, didactic, and observation (demonstration by the teacher) might be expected to be most observable during the process of a consultation.

In particular, the team problem-solving mode appears to mirror the scenario of a consultation. During the process of the resident-attending physician interaction, the initial focus likely would be upon the solution of the patient's problem. However, that solution and perhaps more generalized discussions originated by that problem offer both direct and indirect opportunities for teaching to occur. It should be noted that in patient-physician interactions Elstein et al[3] found physicians generated a number of fairly specific hypotheses relatively early in an encounter. Translating this finding into resident-attending physician interactions would suggest that a single consultation might well reflect the discussion of multiple hypotheses.

The potential for multiple hypotheses would suggest heuristic problem solving, and many writers have identified steps in that process. One such list[4] of interest here is (1) problem sensing, (2) problem defining (diagnosis), and (3) problem resolution (management). Hence, with respect to an immediate patient problem, one might expect the consultation to contain queries and responses about clarifying the problem (patient's complaint) or about deciding the optimum management procedure. Moreover, Goin and Kline[5] found that the best supervisors supplied general information about psychotherapeutic principles to medical students in the context of a specific patient. This finding suggests that in the resident-attending physician consultation, some statements may directly connect the disease of the current patient to theory or to existing literature. Conversely, reference to general principles or the related literature may cause hypothetical situations to enter into the consultation. These hypothetical situations may not be necessary to the care of the specific patient under discussion but represent incidental or indirect teaching opportunities.

The consultation also might be viewed as an information-processing situation, where factual knowledge stored in long-term memory is retrieved after cues are presented. Elstein et al,[6] in studying medical problem solving, reported that problem solvers seemed to differ from nonsolvers in their memory and use of past experiences; that is, knowledge content itself could be more important than any particular problem-solving process. The study of Elstein et al would suggest that recall of knowledge might be observed in the consultation and that the attending physician might either provide the recall or present cues for resident recall.

Beyond the mode of learning and elements of information processing, the climate for the consultation (such factors as dominance, support, and criticism) might be considered important to teaching. Foley et al[7] found that instructors talked much more than students in ward teaching rounds, with 85 percent of the instructors' talk being instructing or providing content. Presumably in the residents' consultation the attending physician would talk less and would spend less time in didactic instruction. Many writers, such as Carl Rogers,[8] might support the need for the consultation to be supportive and to be held in an environment where the exchange of ideas can flow without fear of rebuke.

In summary, the situational context of the consultation viewed against an educational framework seems to suggest a methodological focus on the teaching components in the interaction between learner (the resident) and teacher (the attending physician); for example, what teaching behaviors does the attending physician exploit? To what ex-

tent does the attending physician interact with the resident in a question-answer fashion? Does the attending physician or the resident dominate the consultation?

Methods

The ambulatory care centers in this study were affiliated with the Department of Family and Community Medicine, University of Missouri–Columbia. One center was in the teaching hospital of a metropolitan area of 100,000 people. The other was in a small town of 12,000 located 25 miles away. Thirty residents were in the program, ten in each year of training. The seven attending or senior physicians observed shared major responsibility for supervising the residents. From November 1979 to June 1980, 949 separate consultations between residents and attending physicians were observed directly by one research assistant. The observer was trained by recording resident-attending physician interactions for a month jointly with one of the authors, a person with graduate degrees in adult education and familiarity with the clinical setting.

A Flanders[9] type of interactional analysis instrument was designed to examine the teaching behaviors exhibited during a consultation. The observer recorded a count of verbal statements corresponding to ten categories of teaching behavior selected for study. The interactional analysis form* and working definitions* for each behavior were specifically developed for this study and pretested within the centers.

The ten categories selected are listed in Table 1. Selection was based on general familiarity with the attending process and previously cited research in clinical teaching. Clarifying statements were included because of the importance of problem identification in cognitive psychology and problem-solving theory. Several theories and research suggested that recall of previous information might play an important part in the consultation. Statements made during the consultation that asked or explained "why" were called analytical. An obvious category was concluding statements aimed at diagnosis and treatment plans. Reference statements were those that suggested looking up some fact or consulting with some resource outside the resident-attending physician dyad. Since demonstration plays a role in ward rounds, it seemed reasonable to expect to observe demonstrations in the consultation. Hypothetical statements included those that referred to cases in the literature or earlier experience, similar to that of the present patient but not of direct consequence to that patient's care. Attending physician-patient statements were those suggesting that the attending physician might see the resident's patient, whereupon the two would usually leave the observer and go into the examining room, and the observer would not be able to record any more until the consultation resumed outside the examining room. The inclusion of positive, reinforcing, and negative criticism categories was suggested by theories emphasizing the environment or learning climate.

Consistent with interactional analysis methods, statements were counted only when they initiated a change in the discussion from one category of teaching behavior to another. Hence, two or more consecutive statements exhibiting the same teaching behavior were recorded as one statement, and a response to a question was not recorded as a separate statement. Each such statement was also classified by who initiated that change in teaching behavior (resident or attending physician) and whether that statement was in the form of a question or a declaration.

The 949 consultations observed represented approximately 30 percent of the estimated total consultations during the study period. An observation period was a three-hour clinic session, selected to provide approximately an equal number of observation sessions for each attending physician in the study. A consultation began after the resident had left the patient in the examining room and initiated a conversation with the attending physician. Repeated but separate interactions about the same patient on the same day were treated as a single consultation. Interactions with residents not initiated on behalf of a current patient are omitted from this paper, as are attending physician interactions with nurse practitioners and students.

Direct observation rather than videotape was used because of cost factors. Possible observer effects have been extensively documented else-

*These and other details of the study methods are available from the authors upon request.

Table 1. Distribution of Teaching Behaviors by Category Within the Resident-Attending Physician Consultation (n=949)

Behavior Type	Behavior Observed (Consultations)	Behavior Initiated (Statements)
Clarify	907	5,881
Recall	568	1,838
Analytical	644	2,436
Concluding	864	4,662
Reference	230	351
Demonstration	11	13
Attending physician-patient	419	442
Hypothetical	169	255
Positive, reinforcing	32	38
Negative, criticizing	1	1
Total		15,917

where.[10,11] It is not known what effect the observer's presence actually had on the resident and attending physicians. Over time, any observer effect may well diminish.[11,12] Consensus among the attending physicians was that the observer had little, if any, effect.

Results

In 215 three-hour sessions observed, resident physicians cared for 2,975 patients of whom 949 (32 percent) involved a consultation between a resident and an attending physician. Sixty-five percent of attending physician time devoted to resident consultation occurred in a conference room or elsewhere in the presence of the observer. The remainder occurred in the examining room and was excluded from this study.

Table 1 shows the number of consultations in which each type of behavior was observed. Clarifying and concluding behaviors occurred in over 90 percent of consultations, with 907 of 949 consultations containing one or more statements introducing clarifying information into the attending physician-resident interaction and 864 consultations containing one or more concluding statements about diagnosis or treatment plans. Statements that recalled didactic information or that involved analysis of information and options were observed in approximately two of every three consultations. Spoken statements suggesting reference to texts and other literature or to some outside resource occurred in nearly one fourth of the consultations, and statements introducing hypothetical situations into the discussion occurred in one sixth of the consultations. Statements suggesting the demonstration of a technique or physical skill occurred in only 11 consultations. While verbal positive reinforcement occurred in 32 consultations (3.4 percent), negative or critical statements were observed in only 1 of the 949 consultations. In 419 consultations (44 percent), the attending physician left the observer to see the resident's patient in the examining room.

With ten types of teaching behaviors being studied, the interactional analysis method did not permit the tracking of patterns of sequential behavior. However, Table 1 also shows the number of times each type of teaching behavior was initiated throughout the study. It is clear that in the typical consultation the discussion between resident and attending physician caused clarifying and concluding behaviors to be initiated at multiple points within the consultation. Of the roughly 16,000 statements recorded that initiated a change in teaching behavior, 5,881 statements suggested additional clarifying information to be brought into the discussion, and 4,662 statements related to the

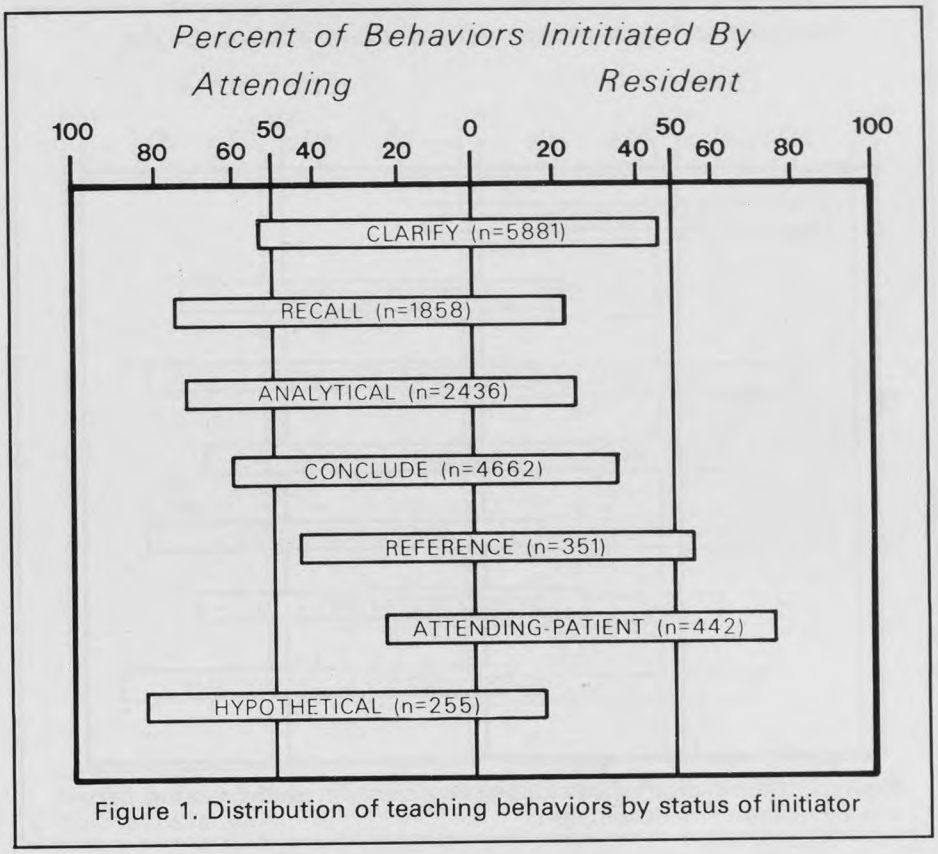

Figure 1. Distribution of teaching behaviors by status of initiator

formation of conclusions. These two types of behaviors accounted for 66 percent of the statements recorded. Statements leading to recall and analysis accounted for another 27 percent of the total. The remaining six types of teaching behavior were reflected in only 7 percent of the statements and tended to occur only once in a consultation, if they occurred at all.

During the study, 90 percent of the 949 consultations were initiated by the resident rather than by the attending physician. Once a consultation was initiated, however, control of the consultation was shared between resident and attending physician (Figure 1). Clarifying, concluding, and reference behaviors were entered into the discussion roughly evenly between the resident and attending physician. Statements indicating a need or desire for the attending physician to see the patient tended to be initiated by the resident. Statements that guided the discussion toward recall, analytical, and hypothetical behaviors, however, were initiated three or four times more frequently by the attending physician than by the resident. There were too few statements in the other three behaviors to draw conclusions.

When attending physicians initiated clarifying statements, they virtually always did so by asking questions of the resident. Otherwise, as Figure 2 demonstrates, the attending physicians' use of questions to guide the consultation to another type of teaching behavior was much less frequent. The resident physicians who initiated clarifying statements (Figure 3) did so in the form of a declaration, since the resident was more likely to be in possession of the relevant patient information, having already seen the patient prior to the consultation. Most of the other teaching behaviors introduced into the discussion by the residents, however, also tended to be statements in the form of a declaration.

Hypothetical behavior, and to a lesser extent recall and analytical behaviors, were considered

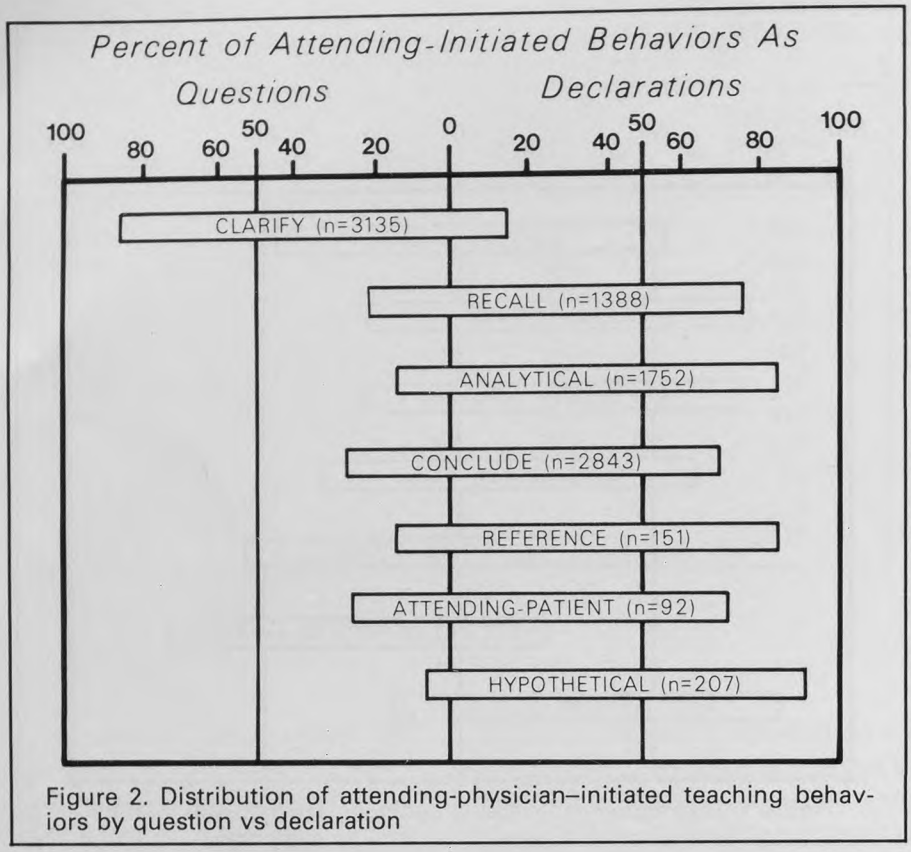

Figure 2. Distribution of attending-physician–initiated teaching behaviors by question vs declaration

more likely to lead to generalizable discussions somewhat beyond the needs of the current patients. Although it was usually the attending physician who introduced those behaviors into a consultation (Figure 1), it was typically done with a declaration rather than with a question for the resident (Figure 2). In the fewer instances (Figure 3) when the resident introduced those same behaviors, however, it was somewhat more likely to be done with specific questions for the attending physician.

Discussion

The major share of the resident-attending physician interaction within a consultation is concerned with the care of the patient under discussion. That two thirds of all statements involve clarifying patient information and discussion of conclusions supports this contention.

The extent to which these and the other behaviors represent merely supervision of the resident as opposed to explicit teaching cannot be readily determined, for this study did not address medical and psychosocial content in the interaction. Explicit teaching opportunities beyond the care of the current patient, however, were sometimes intentionally interjected into the consultation. By definition, statements suggesting hypothetical situations fully met this test. The data show that those teaching opportunities beyond specific patient care occurred in nearly 20 percent of all consultations and that it was the attending physician (the teacher) who introduced them in the vast majority of cases.

As to which theories of learning best describe the interaction between attending physician and resident, all ten learning modes listed by Byrne and Cohen[2] could be observed to a very limited extent. The multiple recurrence of clarify, recall,

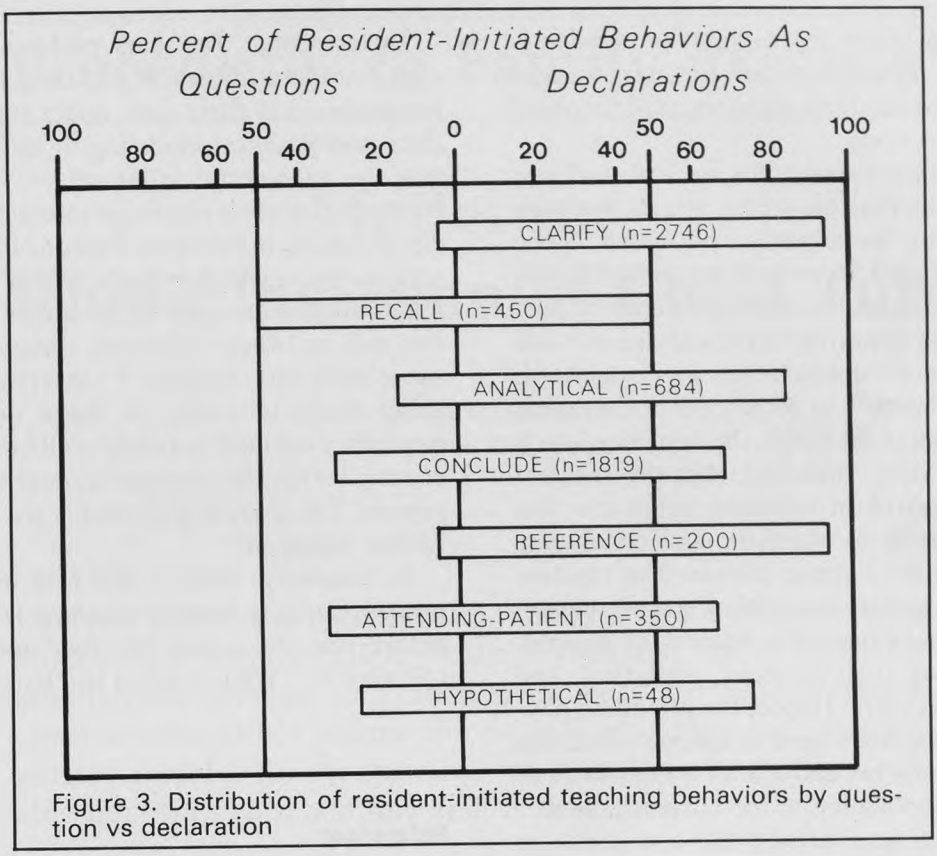

Figure 3. Distribution of resident-initiated teaching behaviors by question vs declaration

analysis, and concluding behavior types within a single consultation and the evidence that both attending physician and resident shared in initiating those behaviors confirm that a consultation is best described as team problem solving. Moreover, the multiple recurrence of those behaviors is at least consistent with the observations of Elstein et al[3] that medical problem solving does not follow the classical closed-system pattern but that physicians continually gather additional data to confirm, disprove, or refine multiple hypotheses developed early in an encounter.

Although there are no data or other proven options to consider, team problem solving may be a relatively inefficient teaching mode in a busy ambulatory care center. The time-dominated pressures of the center may explain the somewhat infrequent insertion of hypothetical situations specifically for the purposes of teaching. Furthermore, it might explain why the attending physician used the questioning technique relatively infrequently. The data suggest that the attending physician, once having gained sufficient clarifying information about the patient, tended to serve as a repository of knowledge, freely offered as declarative statements or as direct answers to resident questions. It is apparently more efficient to provide needed knowledge than to attempt to extract it piecemeal from a busy resident who has this and other patients waiting for attention. Whether freely offering that knowledge is more effective as a teaching strategy is a debatable point, since a reluctance to teach by questioning may represent opportunities for discovery learning that essentially are wasted.

The consultation obviously involved information processing, although in terms of teaching behaviors that dominated the consultation, the information processing behaviors of recall, reference, and analysis yielded an incomplete picture of the resident-attending physician interaction. Although it may be applicable as a model for diagnostic

problem solving alone, information processing is inadequate for describing the broader process that occurs when teaching goals are superimposed upon a clinical setting.

In contrast to ward rounds for medical students, the resident-attending physician interaction was not dominated by the attending physician. Since the resident initiated 90 percent of consultations, the resident maintained considerable control over whether teaching opportunities could occur at all. Moreover, once the consultation was originated, the resident initiated 20 to 80 percent of the teaching behaviors exhibited within the consultation. It is important to note, however, that the resident was most aggressive in initiating behaviors that contributed directly to clarifying and concluding the problems of the current patient. The resident was much less aggressive in initiating those behaviors that might have tended to broaden or generalize the discussion such as recall, analytical, and hypothetical behaviors. Hence, the attending physician should recognize a need to assume a teaching responsibility going beyond that of a repository of knowledge for application to the current patient.

The data show no evidence that a negative or critical learning environment was prompted by either party. Should criticism be justified, it would be unlikely to occur in the semiopen conference room. Similarly, demonstrations—if they occurred at all—would be most likely to occur in the examining room unknown to the observer. The relative infrequency of observing positive, reinforcing behavior during the consultation is somewhat puzzling. The study counted only spoken statements and would have overlooked nonverbal forms of support. Moreover, the amount of praise is no doubt less important than appropriate praise.[13] For comparison purposes, the 3.4 percent of consultations in which praise was explicit in this study is lower than the 6 percent found in a recent study[14] of classroom teacher-student interactions.

Although much of what distinguishes family medicine as a distinct specialty is presumably communicated to residents in the ambulatory centers, the means by which it is (or might be) communicated do not appear to have been analyzed systematically. It is not known whether the limited findings of the exploratory study reported here are typical. No comparable data base was found to describe the interaction between teacher and learner regarding the care of the learner's patient.

In retrospect, the team problem-solving mode aimed at the problems of a current patient, clearly predominant in these data, might suggest that Bandura and Walters' modeling or imitation theory[15] may be a powerful influence on learning in the resident-attending physician interaction. The sharing of control in initiating the consultation itself, as well as the teaching behaviors that occur therein, might suggest a study of the influence of organizational or other structure, theories of learning associated with Ausabel.[16] Observational studies, using methods similar to those described here, might be extended to family medicine teaching occurring within the examining room or on inpatient rounds. These areas plus others are candidates for further research.

In summary, there is much to learn about the process actually used in teaching family medicine before one can attack the fundamental outcome question of "What is good teaching?"

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