Analysis of Resident and Attending Physician Interactions in Family Medicine

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Clinical teaching does not fit neatly into traditional teaching-learning models. The interaction between a resident and an attending physician is of particular interest because it has several functions including education, supervision, socialization, and quality control.

The purpose of this study was to observe, classify, and record verbal teaching and learning behaviors in the resident-attending physician interaction. During a 12-month period, 125 observations of resident-attending physician interactions were recorded; the average length of the interactions was 4.27 minutes.

The six most frequent resident verbal behaviors compared by postgraduate year level did not vary significantly. Only one of the six most frequent attending physician verbal behaviors varied significantly. In the average interaction of about 4 minutes, three fourths of the interaction was on patient care issues, leaving little time for teaching. There are many unanswered questions about the resident-attending physician interaction and its contribution to the training of a physician.

There has been increasing interest in defining, describing, and analyzing clinical teaching, particularly in the ambulatory setting. Most clinical teaching does not fit neatly into traditional teaching or learning models; however, the interaction between a resident and an attending physician is of particular interest because of the broad range of behaviors that come into play. This one-to-one interaction has several functions, including education, supervision, socialization, and quality control.

Traditionally, in the ambulatory setting the resident–attending physician interaction follows the completion of a history and physical examination by the resident. The resident presents the findings to the attending physician, and the ensuing dialogue becomes a teaching-learning experience focused on the care of the patient. Teaching and learning may be categorized as instruction, question-and-answer, inquiry–problem solving, modeling, consultation, demonstration, clarification, or seeking information from such outside resources as texts or consultants. When a diagnosis and a management plan have been developed that are acceptable to the resident and to the attending physician, the resident returns to the examination room to discuss the findings and the plan with the patient.

There are many variations to this basic scenario. In some training programs, all residents present all patients to the attending physicians, and in others, the interns present all patients, but second- and third-year residents present a proportion of their patients or present only at the residents' discretion. The resident and the attending physician may see the patient together, the resident may be viewed from an observation room or by video, or the entire interaction may be centered on the resident's presentation of a patient whom the attending physician never sees.

Few observational studies of one-to-one clinical teaching have been published. Foley and others[1] videotaped 17 randomly selected clinical teaching sessions in a core medical school clerkship and analyzed the verbal behavior and the level of verbal interaction. Foley defined low-level information and low-level questions as reporting, reading, summarizing, giving or asking directions, giving information, or asking about procedures or facts. High-level information and questions included comparing, contrasting, evaluating,

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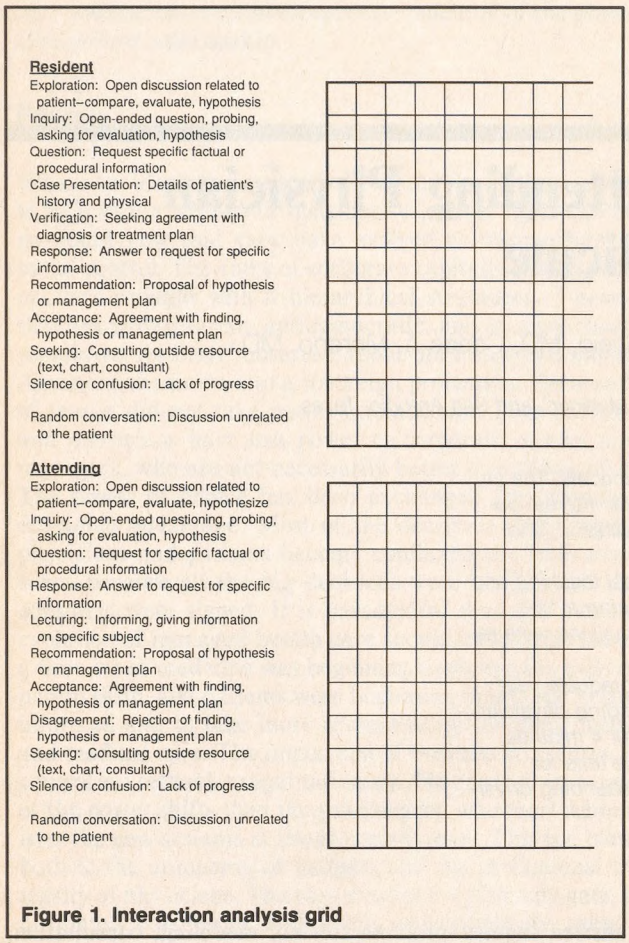

Figure 1. Interaction analysis grid

synthesizing, predicting, and hypothesizing. The 17 observations included teaching rounds, working rounds, morning reports, lectures, patient management conferences, grand rounds, and journal clubs. Low-level information and questions accounted for 78% of instructor talk and ranged from 69% in morning reports to 86% in lectures.

Glenn and others[2] observed 949 interactions between residents and attending physicians in a family medicine ambulatory care center. Teaching behaviors were placed in ten categories on an interaction analysis recording form. Clarifying information and concluding statements were observed in 90% of the interactions; statements that recalled didactic information or involved analysis of information and options were observed in two of every three interactions. Multiple recurrence of clarifying, recalling, analytical, and concluding behaviors occurred in the same teaching interaction, and Glenn et al concluded that resident–attending physician teaching was best described as team problem solving.

Williamson and others[3] observed resident–attending physician interactions to determine clinical independence and assertiveness. First-year residents consulted the attending physician in 48% of the visits compared with 28%

TABLE 1. PROPORTION OF TIME THE RESIDENT TALKED COMPARED WITH THE TIME THE ATTENDING PHYSICIAN TALKED

Residency Year	Resident Talked*		Attending Physician Talked	
	Minutes	Percent of Interaction	Minutes	Percent of Interaction
First	2.62	56.4	2.03	43.6
Second	2.61	59.4	1.78	40.6
Third	2.10	59.8	1.41	40.2

**The differences between the 3 postgraduate years were not statistically significant.*

and 26% for second- and third-year residents, respectively ($P < .005$). The mean duration of the interactions decreased from 7.7 minutes for first-year residents to 6.9 and 6.1 minutes for second- and third-year residents, respectively ($P < .05$). More senior residents engaged in more focused interactions and demonstrated clinical independence and educational assertiveness.

The authors of this study were interested in developing an observational model to better describe the resident–attending physician interaction. The purpose of this study was to observe, classify, and record verbal teaching-learning behaviors in the resident–attending physician interaction.

METHODS

Family medicine residents at the University of Missouri–Columbia present patients to the attending physician in a conference room adjacent to the examining rooms. Interns are expected to present all patients to the attending physician. Second- and third-year residents present their patients or cases at their discretion; all encounters are reviewed by the attending physician, but not necessarily at the time the patient is in the clinic. Following the case presentation and discussion of a patient, the resident returns to the patient in the examining room; in some cases the attending physician accompanies the resident to see the patient. Most teaching or learning occurs during the case presentation and discussion of the patient. Attending physicians use this opportunity differently depending on their attending style, the number of patients to be seen by the resident, the chief complaint, and the skills of the resident.

Using videotapes of resident–attending physician interactions, common verbal behaviors were noted and classified. A grid was developed for recording the verbal behaviors at 15-second intervals. This grid was tested and revised, and a final version was prepared for use in this study (Figure 1).

To test the reliability of the observation method, 20

interactions were videotaped. After the actual interaction was observed and the verbal behaviors recorded, the videotape of that interaction was viewed 2 weeks later, and the verbal behaviors were recorded again. The videotape made it possible to record the resident's and attending physician's behaviors twice for comparison. Using pi, an index of agreement for nominal scale judgments,[4] the level of agreement was 0.79—acceptable for observations. The behavior that most frequently caused a problem in coding followed a question from an attending physician when a resident's response could have been classified either as answering a request for specific information or as extending the case presentation.

An educator observed resident–attending physician interactions in the conference room using the grid for classifying and recording the verbal behaviors of the resident and the attending physician. Data were recorded only in the conference room, where residents presented their cases to the attending physician. Observations did not include interactions that took place in the examining rooms or hallways. Some interactions began in the conference room, moved to an examining room, then continued in the conference room. These interactions were recorded as one presentation, but excluded the portion that took place in the examining room.

The data were examined first to determine the content of the resident–attending physician interactions. Analysis of variance was used to determine whether differences existed in the way residents at each postgraduate year level interacted with attending physicians and the way attending physicians worked with residents.

RESULTS

During a 12-month period, 125 randomly selected resident–attending physician interactions were observed in the Family Medical Care Center. In 24 observations (19%) the resident and the attending physician left the conference room during the observation to talk with the patient; this portion of the teaching interaction was not included in this study.

As expected, the largest number of observations (n = 65) were first-year resident–attending physician interactions, followed by 42 interactions with second-year residents, and 18 with third-year residents. The average length of each observation was 4.27 minutes. Interactions with first-year residents averaged 4.65 minutes, 4.39 minutes with second-year residents, and 3.51 minutes with third-year residents. The differences between these means were not statistically significant. The shorter interaction time for third-year residents was accounted for by equal reductions in both the resident and attending physician parts of the interaction.

An important feature of a resident–attending physician interaction is the proportion of the total time the resident talked compared with the proportion of time the attending physician talked. Residents talked during more than one half of the interaction, ranging from 56% for first-year residents to 60% for third-year residents. The differences between the 3 postgraduate years were not statistically significant (Table 1).

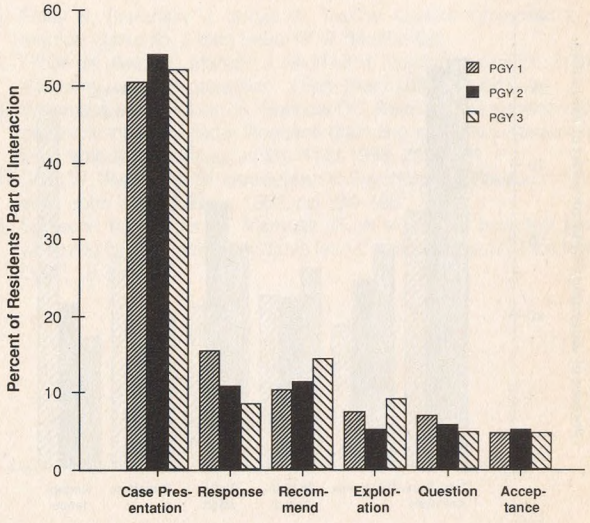

Figure 2. Resident behaviors examined by postgraduate year (PGY)

Classification of residents' verbal behaviors during the interactions revealed consistency in the way that residents, regardless of level, related to attending physicians. The six most frequent resident behaviors by postgraduate year are depicted in Figure 2. These six behaviors accounted for more than 90% of the residents' part of the interaction. Presentation of the patient's case to the attending physician accounted for one half of the residents' interaction time. None of these six behaviors varied significantly when compared by postgraduate year.

The other part of the interaction—attending physician's verbal behaviors—was examined by postgraduate year. The six most frequent behaviors are shown in Figure 3 and accounted for more than 75% of the attending physicians' part of the interaction. The proportion of time the attending physicians spent accepting or agreeing with the resident's recommendation or proposed action was significantly different ($P = <.05$) when the three postgraduate years were compared. Attending physicians spent proportionately more of the interaction time (25%) accepting or agreeing with the third-year residents' recommendations or proposed action, compared with 8.7% and 10.9% for first-year and second-year residents, respectively. Attending physicians did more exploration or open discussion with third-year residents, although the differences were not statistically significant. Attending physicians also gathered more information by direct questioning and lectured more with first- and second-year residents.

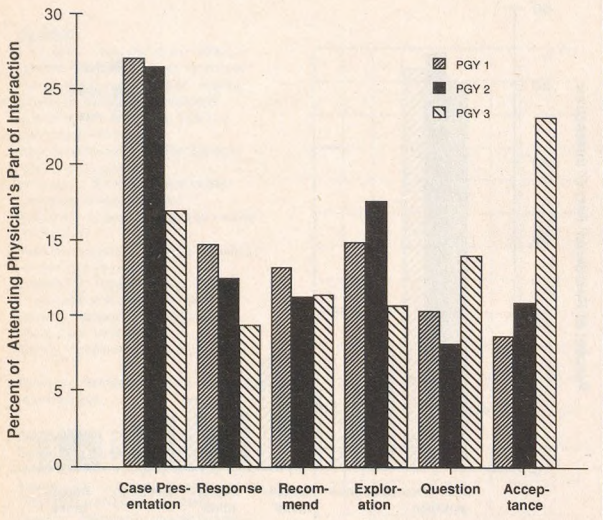

Figure 3. Attending physician behaviors examined by postgraduate year (PGY), $P < .05$

DISCUSSION

Observation and analysis of clinical teaching are difficult because (1) not all the events are observable, (2) each interaction is spontaneous, and (3) recording of observed behaviors is only part of a teaching-learning interaction. Foley and others[1] described two gross indices of learner involvement in medical problem-solving—the ratio of teacher-to-learner talk, and the level of thinking demonstrated by the teacher and learner.

The observations of family medicine resident–attending physician interactions in this study indicated that residents talked more than one half of the interaction, an amount that did not vary significantly by postgraduate year. It might be expected that second- and third-year residents presenting cases at their discretion would present cases that were more complex and necessitated longer interactions. On the other hand, the length of the interactions might decrease as residents gained experience and skills in patient care and in interacting with the attending physicians. In this study the average length of the interactions decreased with each succeeding year of training. Similar proportional decreases were seen in the study by Williamson and others.[3] Additional research must include case mix as an independent variable.

More than three fourths of the total resident–attending physician interactions involved presentation of the case by the resident and information gathering through direct questions by the attending physician. Thus, in an average interaction of a little more than 4 minutes, the demands of data gathering to assure good patient care left very little time for teaching. Additional study is needed to determine whether scheduling patients to allow for more teaching time would be justified educationally and financially. Even more basic, it should be determined whether attending physicians would use additional time for teaching if it were available.

The authors were puzzled by the similarity in residents' verbal behaviors regardless of postgraduate year, and the variations in the behaviors of the attending physicians (although only one was statistically significant) when interacting with residents at different levels. Thus, the attending physicians taught differently at the postgraduate year levels, but the residents interacted in much the same manner. This finding seemed to be contrary to the findings of Williamson et al,[3] which showed increasing independence with resident level.

Of the six most common resident verbal behaviors, only exploration and open discussion is a teaching-learning behavior and accounted for 10% or less of the residents' part of the interaction. The other resident behaviors were more specific to patient care issues, although it is difficult to discriminate between patient care and teaching behaviors. Attending physician behaviors were also more specific to patient care, and about 35% of the attending physicians' time related to teaching and learning.

Facilitating the development of residents' clinical problem-solving skills through the use of questioning and discussion strategies by attending physicians is encouraged during faculty development teaching skills seminars. Direct questions are suggested as a means of completing the clinical picture of the patient being presented and to narrow or focus the residents' problem-solving. In contrast, inquiry or open-ended questions are suggested to redirect or widen the residents' thinking. It may be that while teaching through questioning, the Socratic method, is preferred, it is also the most time-consuming and inefficient method of attending physician teaching.

The total time for resident–attending physician interactions is relatively short when compared with other teaching-learning experiences such as grand rounds or morning report. How much the resident–attending physician interaction contributes to learning is unknown. In practice, this interaction may have more of a supervision or quality control function than an educational function. If the residents' presentation is the only source of information about the patient for the attending physician, it is appropriate that a substantial portion of the interaction focuses on gathering information. Thus, actual teaching by the attending physician is limited by the nature of the interaction, and scheduling of patients to allow time for teaching may be necessary.

In addition, Schwenk and others[5] studied the teacher-learner events reported by family practice residents and found that family practice faculty account for less than 10% of the teaching time for first- and third-year residents and 25% for second-year residents. That study concluded that there is relatively little family practice influence throughout the training program. Although the locus of learning shifted from the inpatient setting to ambulatory

care, specialty influences dominate through the 3 years, especially in the third year.

These findings make it imperative that teaching and modeling of family practice problem-solving be increased in the residency curriculum. In the short term, the resident–attending physician interactions are the most appropriate for this teaching and modeling. To teach problem-solving skills, time must be provided, and the teaching skills of the attending physicians must be enhanced so the interactions become a balance of patient care and teaching.

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