

The Development of Clinical Independence: Resident-Attending Physician Interactions in an Ambulatory Setting

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Interactional analysis data from 949 resident-attending physician interactions about the care of 2,975 ambulatory patients were analyzed to test the hypothesis that consultation rates and behaviors would demonstrate a progressive increase in clinical independence and assertiveness. Consultation rates for first-, second-, and third-year residents were 48, 28, and 26 percent, respectively. The mean durations of consultations were 7.7, 6.9, and 6.1 minutes, respectively. Attending physicians visited 20, 12, and 13 percent of the patients of first-year, second-year, and third-year residents. The more senior residents displayed fewer of most types of interactional behaviors, suggesting a more focused discussion. Senior residents showed a progressive increase in initiating interactions of all types, demonstrating a kind of clinical independence and educational assertiveness that progressed through three years. There is a growing consensus that teaching in ambulatory medical practices will become widespread, but little information directs educational efforts in these settings. The findings suggest that clinical independence in the ambulatory setting is progressive and that measurements of consultation rates and behaviors expand knowledge about education in ambulatory care.

A critical step in house staff and student education is the attainment of independent behavior.² That premise was based upon the experiences of Greganti and associates¹ as attending physicians on ward rounds in internal medicine. It is no less true for education that occurs in ambulatory settings and in other specialties.

Perkoff,² Shine,³ and others⁴ have argued that teaching clinical medicine in ambulatory settings is an old idea whose time finally may have arrived. Pressures to reduce lengths of hospitalization may shift a greater share of clinical teaching from inside to outside the hospital. Advocates of more ambulatory-based teaching recognize the many problems associated with this shift. At one level are financial barriers; some observers consider it unlikely that

outpatient revenues can defray the full costs incurred in the outpatient setting.^{5,6}

At a second level are operational problems. Few studies have described the mechanics for achieving both educational and patient care goals in an outpatient setting. Among these is Mamlin and Baker's⁷ time and motion study of interns, residents, and fellows in an internal medicine outpatient setting. They showed that time devoted to individual patients and charting decreased substantially as trainees obtained more experience, but consultation time with the attending physician averaged one to two minutes per patient visit for all three categories of trainees. The rate of consulting of the attending physician was not reported. Gururaj et al⁸ studied nine physicians in their first and second year of pediatric residency and found a consultation rate of 55 percent. Kosecoff et al⁹ evaluated 15 sites providing ambulatory training in general internal medicine. They reported that residents consulted the supervising physician in 41 percent of 1,611 patient visits. The rate of consultation varied widely, however, ranging from 5 to 99 percent of visits among the sites. The latter two studies did not make distinction regarding year of training.

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At a third level, data describing educational processes employed in the outpatient setting and their contributions to house staff learning are inadequate. It is reasonable to presume that independent clinical behavior develops over the entire course of a training program and that a variety of patient care and faculty activities contribute. No studies document, however, the behavioral characteristics of that development in outpatient teaching settings. Knowledge about the attainment of clinical and educational independence should be useful to those who plan to move educational activities into ambulatory settings.

An earlier study at the University of Missouri-Columbia used interactional analysis techniques to quantify teaching-learning behaviors in 949 interactions between residents and faculty physicians in family medicine outpatient settings.¹⁰ Most of the interactions concerned the care of a patient then being seen by the resident rather than with hypothetical issues. The attending physician rather than the resident appeared to lead those interactions. Variation in individual behaviors by year of training was not considered in that report.

In this paper those 949 interactions are partitioned into three groups determined by year of residency. This stratification tests the hypothesis that the rate of consultation with an attending physician and the pattern of behaviors in those interactions differ by year of residency in a manner consistent with a progressive attainment of independence. Specifically, this method was employed to determine whether more senior residents would consult the attending physician less frequently and for shorter durations, would require the attending physician to see their patients less often, would demonstrate a more focused pattern of interactional behaviors, and would be more assertive in offering new information into the consultation discussion.

METHODS

Sites from which data were collected are two model family practice centers of the University of Missouri-Columbia. One center is in a teaching hospital in a city of 70,000. The other is in a town of 11,000 located 25 miles from the university.

Between November 1979 and June 1980, 949 separate consultations between a resident and an attending faculty physician were observed directly by one research assistant. An observation period was a three-hour interval supervised by one of seven faculty included in the study. Thirty residents, ten in each of three years of training, saw patients in the centers. Two to six residents staffed each session. Residents and faculty alternated between the centers. Selection of sessions and faculty for observation was based on maximizing the number of observed sessions per faculty member. Usual attending physician schedules were not altered. At the time of the study, there were no rules requiring mandatory consultations.

A consultation was defined as a resident-faculty interaction about a resident's patients that began after a resident left a patient in the examining room and initiated a conversation with the attending physician. Interactions initiated for other purposes were not counted in this study. The observer recorded the duration of a consultation, including any time spent by the attending physician with the resident's patient. The number of patients seen by each resident was recorded so that the rate of consultation and the rate at which the attending physician saw the resident's patients could be computed.

For each consultation, a Flanders type of instrument¹¹ was used to document resident and attending physician behaviors for that portion of an interaction occurring outside the examination room. This technique was developed to analyze teaching behaviors by counting various types of predetermined interactional categories. The observer, trained by recording interactions with an experienced educational specialist, counted verbal statements corresponding to ten categories of behavior. The training period was followed by intermittent, joint observations, but formal assessment of reliability and validity was not done.

Behaviors were selected based upon a faculty-derived consensus of important characteristics of the outpatient teaching process and the literature on clinical teaching. Three behaviors are excluded here because they occurred in fewer than 3 percent of consultations.¹⁰ The remaining seven behaviors, clarify, recall, analytic, conclude, reference, faculty-patient, and hypothetical, are defined as follows:

Clarify—Statements that clarify the topic of discussion, usually applied to defining the patient's condition or problem or about management plans, and included because of the importance of problem identification in problem-solving theory models

Recall—Statements that related the recall of previous clinical experience or information

Analytic—Statements that asked or explained "why"

Conclude—Statements made to terminate or finalize discussion about diagnosis or treatment plans

Reference—Statements suggesting the use of a book, consultant, or other resource outside the resident-attending physician dyad to help with problem-solving

Faculty physician to patient—Statements suggesting that the attending physician see the resident's patient

Hypothetical—Statements that referred to the literature or experience, similar, but not directly applicable, to the patient under discussion. Usually meant to further the teaching scope of a given case.

Statements were counted only when they initiated a change in the discussion from one category of behavior to another. Consecutive statements exhibiting the same behavior category were recorded as one statement. Each statement also was classified as to which person (attending or resident physician) initiated the change and whether that change was initiated by a question for the other participant or by offering new information.

TABLE 1. RESIDENT CONSULTATIONS WITH ATTENDING PHYSICIANS

Residents	Total Visits	Total Consultations	Consultation* Rate	Consultation Time: Minutes per Patient**	Number Attending Physician Patient Visits	Percent of Visits*
First year	701	339	48	7.7 (± 4.2)	138	20
Second year	1,032	290	28	6.9 (± 5.3)	121	12
Third year	1,242	322	26	6.1 (± 4.1)	160	13
Total	2,975	949	32	6.9	419	14

* $P < .005$ for 3×2 chi-square, $df = 2$
 ** $P < .05$ for all pairwise comparisons

Five statistics were used as indices of clinical independence: (1) consultation rate as a percentage of patient visits, (2) mean duration of consultation, (3) the rate at which the attending physician saw the residents' patients, expressed as a percentage of total patient visits, (4) relative frequency at which specific behaviors were observed at least once in a consultation, expressed as a percentage of total consultations, and (5) the share of those behaviors initiated by the trainee offering new information, expressed as a percentage of all behavior changes.

Inferences concerning the statistical significance of differences in those indices among resident groups were based on chi-square tests for proportions and *t* tests for means of continuous data. Adjustments for multiple comparisons were not employed.

RESULTS

During the 215 three-hour sessions observed, residents cared for 2,975 patients. Those visits generated 949 consultations with an overall consultation rate of 32 percent. First-year residents consulted the supervising physician in 48 percent of visits, compared with 28 and 26 percent for the second- and third-year residents, respectively, a significantly higher rate ($P < .005$). The mean duration of consultations decreased with each additional year of residency ($P < .05$), but the absolute time differences were rather small (Table 1). Further, the supervising physician saw 20 percent of patients of first-year residents, a percentage significantly higher ($P < .005$) than the 12 and 13 percent seen with the more senior residents.

Within the 949 consultations, 15,865 statements were recorded that initiated a change in interactional behavior. The percentage of consultations in which a behavior was observed at all is displayed in Figure 1. Clarify, recall, analytic, and conclude behaviors occurred in more than one half of all consultations regardless of year of residency. There was a consistent pattern demonstrated among the three levels of training. Those four behaviors occurred less frequently with increasing levels of residency experience, with those differences being significant in three of the four behaviors. Differences in reference, attending

physician-patient, and hypothetical behaviors were not statistically significant.

Overall, 5,207 of the 15,865 behavior changes were initiated by new information from the resident (33 percent). There was a progressive increase in the rate of resident-initiated behavior change. First-year residents initiated 27 percent, second-year residents 34 percent, and third-year residents 39 percent of behavior changes ($P < .005$). In Figure 2 these data are partitioned for each of the seven behaviors. In six of the seven behaviors, the proportion of such behavior changes initiated by residents increased significantly with each additional year of residency. Only behavior changes introducing hypothetical issues into the interaction failed to reflect that pattern.

DISCUSSION

The results are consistent with the hypothesis that trainee-faculty interactions about ambulatory patient care issues reflect a progressively independent behavior on the part of residents in their later years of training. Some anomalies in the results, however, bear upon larger issues in ambulatory teaching.

These data demonstrate the expected, progressive increase in clinical independence and assertiveness. It should be noted, however, that this study was cross-sectional, not longitudinal. Hence, it is possible that the changes from one educational level to another were characteristic of the individuals rather than of variations in residency level. Given the number of residents in the study and their diversity of educational background, this explanation is unlikely.

Consistent with the hypothesis, second- and third-year residents consulted with their attending physician less frequently and used less faculty time than first-year residents. The attending physician also saw a larger share of the first-year residents' patients. The more senior the resident, the less likely any particular behavior was to recur within a consultation. The decrease in the frequency of behavior changes implies that the discussion was more focused and corresponds with the observed decrease in the average consultation time for the three groups of residents. The

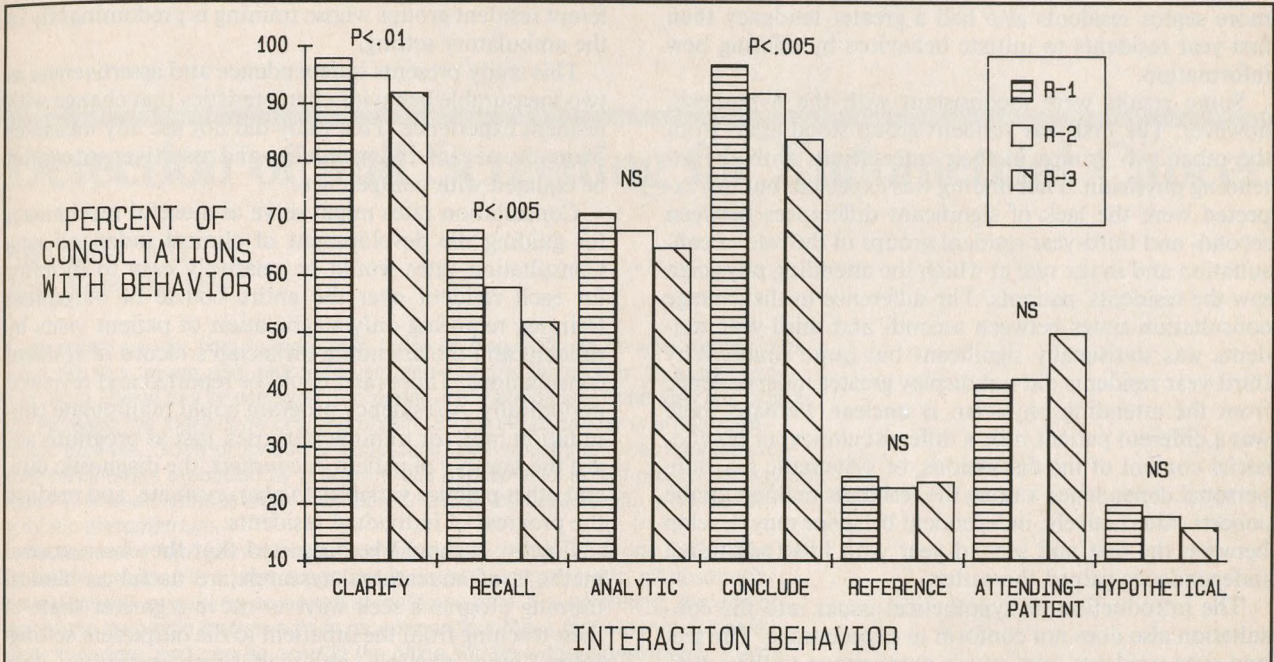


Figure 1. Percentage of consultations in which specific behaviors were recorded, partitioned by resident group. P values are calculated with a 3 × 2 chi-square, df = 2. NS, not significant; R-1, first-year resident; R-2, second-year resident; R-3, third-year resident

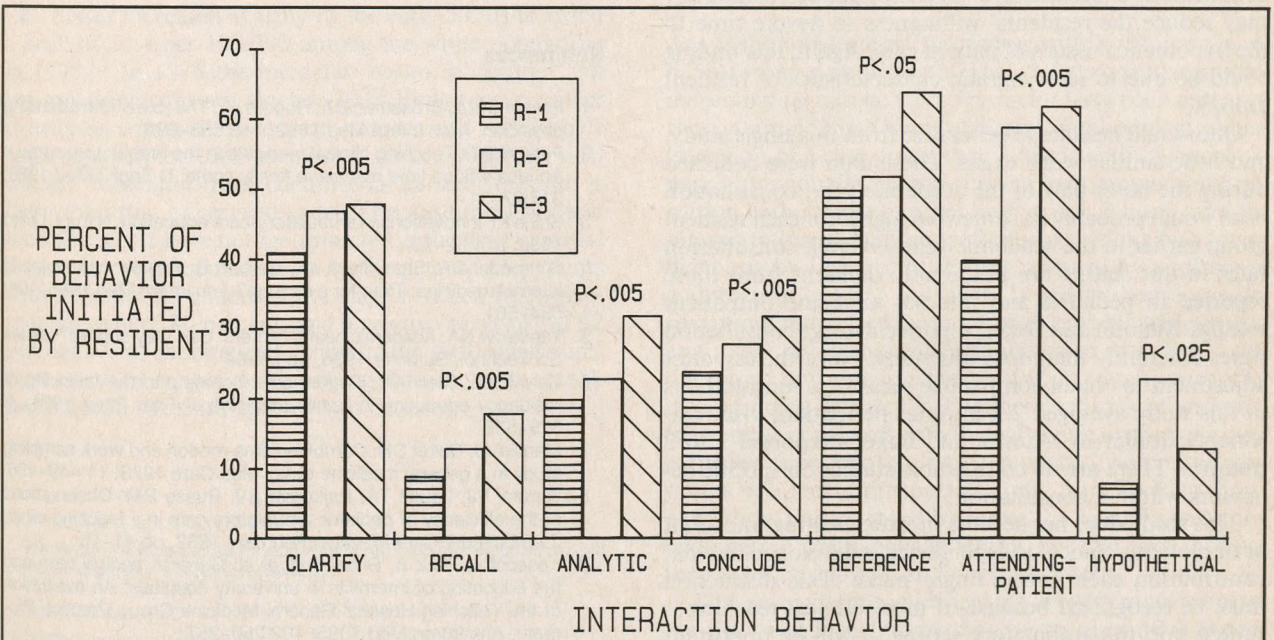


Figure 2. Percentage of behaviors that were initiated by new information introduced by the resident, partitioned by resident group. P values are calculated with a 3 × 2 chi-square, df = 2. NS, not significant; R-1, first-year resident; R-2, second-year resident; R-3, third-year resident

more senior residents also had a greater tendency than first-year residents to initiate behaviors by offering new information.

Some results were inconsistent with the hypothesis, however. The first-year resident group stood apart from the other two groups in their interactions with the attending physician. That finding was expected, but not expected were the lack of significant differences between second- and third-year resident groups in the rate of consultation and in the rate at which the attending physician saw the residents' patients. The difference in the average consultation times between second- and third-year residents was statistically significant but quite small. Why third-year residents did not display greater independence from the attending physician is unclear. Perhaps there was a different patient mix, a different clinical or psychosocial content of the discussions, or systematic biases in personal dependence among the residents making up the cohorts. Alternatively, independent behavior may develop between the first and second year with little additional independence gained thereafter.

The introduction of hypothetical issues into the consultation also does not conform to expectations. The second-year residents were much more prone to introduce hypothetical issues than were either the first- or third-year residents. From an educational standpoint, the second year may be the approximate point at which trainees become sufficiently comfortable with patients and faculty to expand their learning beyond the immediate needs of the current patients. By the third year, perhaps the volume of patients or expectations of efficiency and self-sufficiency may reduce the residents' willingness to devote time to the hypothetical issues of patient care. Again, this finding could be due to idiosyncratic characteristics of resident groups.

One would hesitate to generalize from this single study, and little similar work exists. These data were collected during the latter part of the academic year; consultation rates would probably be somewhat higher for each resident group earlier in the academic year. Overall, consultation rates in this setting are not greatly different from those reported in pediatric and internal medicine outpatient settings. Mamlin and Baker⁷ reported average consultation times differently than does this study. Nevertheless, after adjustment to obtain comparable measures, consultations in this study averaged 2.2 minutes per patient visit, reasonably similar to Mamlin and Baker's reported 1 to 2 minutes. There are no comparable studies on specific behaviors within a consultation.

This study does not address in which setting, inpatient or outpatient, clinical independence is developed or what contribution each setting might make. This distinction must be recognized because, if more clinical teaching is shifted into the ambulatory setting, it will be important to consider what the specific loss might be in the content of primary care training and in the development of clinical independence. These data do show evidence that progressive clinical independence can be detected among dif-

ferent resident groups whose training is predominantly in the ambulatory setting.

This study presents independence and assertiveness as two measurable behavior characteristics that change with resident experience. This study did not use any measures of quality of care. Independence and assertiveness cannot be equated with competence.

Consultation rates might serve as a useful mechanism for guiding the development of clinical independence. Consultation rates would be relatively easy to monitor for each resident over the entire course of outpatient training, requiring only a tabulation of patient visits by resident and the attending physician's record of resident consultations. Those rates could be reported and reviewed periodically. A residency program could manipulate consultation rates for training purposes, just as programs adjust the number of patient encounters, the diagnostic mix, and other practice variables to plan, evaluate, and readjust the progress of individual residents.

Finally, it should be suggested that the observational methods of educational research are useful as clinical training programs seek ways to move a greater share of their teaching from the inpatient to the outpatient setting. Interactional analysis, although time-consuming, does appear to be one useful technique for documenting the behaviors in clinical teaching. Augmenting interactional analysis with categorization of patient problem and content of the consultation would make the technique even more useful in studying outpatient teaching.

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