What do Attending Physicians Contribute in a House Officer-Based Ambulatory Continuity Clinic?

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OBJECTIVE: To study the educational contributions of attending physicians in an internal medicine house staff ambulatory clinic.

DESIGN: Cross-sectional, self-administered survey.

SETTING: University-affiliated general internal medicine practice.

PATIENTS/PARTICIPANTS: Internal medicine residents and attendings.

MEASUREMENTS AND MAIN RESULTS: Attending and resident perceptions of whether attendings made contributions to teaching points, diagnosis (DX), therapy (RX), and health care maintenance (HCM) were assessed in 428 patient encounters. Resident assessments significantly exceeded attending self-assessments of contributions to teaching points (82% vs 74%, $P=.001$), DX (44% vs 34%, $P=.001$), RX (61% vs 55%, $P=.02$), and HCM (19% vs 15%, $P=.04$). Both residents and attendings perceived that contributions declined progressively with increasing resident year ($P<.05$). Primary care and categorical residents assessed attending contributions comparably. However, attendings perceived contributing more to RX and HCM for categorical residents than primary care ($P<.05$). Male and female residents assessed attending contributions comparably. However, attendings perceived contributing generally more to DX in male residents than female ($P=.003$). In 8% of encounters, either residents or attendings felt that patient evaluation by the attending was needed. In these encounters with personal patient evaluation by attendings, both residents and attendings felt that attendings made more contributions to DX ($P=.001$) and teaching points than in other encounters.

CONCLUSIONS: Attending physicians consistently underestimate their perceived contributions to house officer ambulatory teaching. Their personal patient evaluation increases assistance with DX and teaching points. Given perceived declining contributions by training year, attendings may need to identify other teaching strategies for interactions with senior residents.

KEY WORDS: medical education; ambulatory care; internship and residency; bedside training.

DOI: 10.1111/j.1525-1497.2006.00423.x

J GEN INTERN MED 2006; 21:435-439.

In recent years, medical education has increasingly emphasized training in ambulatory medical practice sites.¹ The Accreditation Council for Graduate Medical Education now specifies that 25% of all training be in ambulatory sites.² Program objectives and formats for ambulatory care training have been described.²⁻⁵ However, there is little information about the effectiveness of attending teaching contributions in ambulatory medical education. Nor is there substantial information regarding the educational experience and learning outcomes of medical residents in these settings.^{6,7} In contrast to hospital

inpatient settings where faculty members, subspecialty fellows, students, and senior residents all contribute to teaching, the ambulatory setting generally consists of brief, 1-on-1 interactions between attending and trainee while patients are waiting. Furthermore, discussion time may be devoted to only the most acute medical problems, and neither the attending nor the resident can prepare ahead of time for the clinical discussion, as patient problems may be unpredictable and data may be incomplete.⁸ These differences may impact the effectiveness of attending teaching contributions.

Understanding the resident education process in ambulatory settings is useful to develop ways in which attendings can teach more effectively. The purpose of this study was to assess the frequency with which residents and attending preceptors perceived that contributions were made to diagnosis, therapy, health care maintenance (HCM), and general teaching issues in an internal medicine house staff ambulatory clinic. Additionally, resident characteristics that might alter perceptions of attending contributions were evaluated. Finally, the effect of personal patient evaluations by attendings was assessed.

METHODS

Setting, Patients, and Physicians

This cross-sectional study took place in a resident ambulatory internal medicine continuity group practice associated with the University of Colorado Health Sciences Center. Approximately 30% to 40% of patients were insured by a Medicaid health maintenance organization, 30% to 40% by Medicare, and 30% to 40% by other sources (self-pay, commercial insurance, or other HMOs). All patient encounters were eligible for study. Two to 4 scheduled house officer-patient encounters were selected randomly at the beginning of each clinic session for invitation for study participation. Forty-two categorical internal medicine, primary care track internal medicine, and preliminary track residents participated. Attending physicians consisted of 14 board-certified, primary care internists affiliated with the University of Colorado Health Sciences Center who precepted in resident clinic one half-day session per week and had no other patient care responsibilities during clinic. Two to 8 residents were scheduled in a typical clinic session, with 1 to 3 attendings present. The resident-attending ratio was less than 4:1. Residents were not assigned to work with a specific attending. Residents and attendings had worked with each other for at least 6 months prior to the study, but the number of sessions together was highly variable and influenced by inpatient-service-related clinic rescheduling, and vacations. The study was conducted between January and June 1999.

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Study Design

During regular clinic time and immediately after the randomly selected house officer-patient visit, the resident and the attending with which they had staffed the patient were invited to independently and anonymously complete questionnaires regarding the teaching encounter. A teaching encounter was defined as a 1-on-1 discussion between the resident and attending physician regarding the patient visit. The patient was asked to complete a questionnaire regarding their overall health, visit satisfaction, and demographic information. Written informed consent was obtained from all study participants. No patient or physician refused to participate. All encounters took place in the second 6 months of the academic year, when an attending-patient interaction was not mandatory under physical presence exception rules, but occurred if the attending or house officer felt that attending patient evaluation was necessary.

Survey Instrument and Outcome Measures

A questionnaire to measure attending teaching contributions was designed, using input from clinician educators and medical education investigators during small group discussions. The questionnaire was revised for clarity and completeness of content based on results of pilot surveys. For each patient encounter, the attending and the house officer were asked to provide "yes" or "no" responses to 3 questions: "Did the attending physician make contributions with regard to diagnosis?" "Did the attending physician make contributions with regard to therapy/management?" "Did the attending physician make contributions with regard to health care maintenance?" The respondents were asked to further subcategorize attending contributions. Subcategories for attending contributions regarding diagnosis included recommendations for additional history or records, examinations, tests or procedures, referrals, and suggestions of additional diagnoses. Subcategories for attending contributions regarding therapy included recommendations regarding stopping, starting, changing, or continuing medications, recommendations for procedures, referrals, patient education materials, or for change in monitoring/follow-up. An additional fourth question asked the respondent to indicate whether any teaching points were made regarding diagnoses, therapy, health maintenance, communication, documentation, medical-legal issues, insurance-referral-billing issues, or other issues. The terms "contributions" and "teaching points" were left to the interpretation of the participant completing the questionnaire and were not further defined. Both residents and attendings were also asked "Did you and the attending initially differ over diagnostic and/or therapeutic assessment in this case?" Finally, the residents were asked to provide information on their gender, year of training (first, second, or third), and training track (categorical or primary care). A single professional research assistant obtained informed consent and collected all study questionnaires from house officers, attending physicians, and patients.

The study was approved by the University of Colorado Multiple Institution Review Board (COMIRB).

Data Analysis

Teaching contributions were categorized into the following domains: diagnosis (DX), therapy (RX), HCM, and general teaching points. The frequency of "yes" responses (indicating a positive teaching contribution) to each of the 3 "yes/no" questions was determined. For the fourth question on teaching points, any checked category indicated that a teaching contribution was made. The individual house officer-attending interaction was the unit of analysis. McNemar's test for paired data was used to evaluate the statistical significance of differences between resident and attending perceptions of teaching contributions. Within the separate strata of resident responses and faculty responses, the effect of residency track and gender were evaluated using standard χ^2 tests for bivariate comparisons. The effect of year of training was evaluated using the χ^2 test for trend. All statistical analyses were conducted with SAS statistical software (SAS Institute, Inc., Cary, NC).

RESULTS

Fourteen attending physicians (9 male and 5 female), and 42 residents participated in the survey. Twelve residents (29%) were in the primary care track, 28 (67%) were in the categorical track, and 2 (4%) were preliminary 1-year residents. Sixty percent were male and 40% were female. They were nearly evenly divided between the first through third years of training (31% first year, 29% second year and 40% third year). Overall, 428 patient encounters were assessed. The patient characteristics were as follows: 68% were female, 52% were ages 45 to 64, 25% were over age 65, 67% had a high school education or less, 87% had an annual income of \$15,000 or less, 43% were of a minority race/ethnicity, and 50% self-rated their health as "poor or fair."

Residents assessed that attendings made teaching contributions to most cases. This significantly exceeded attending self-assessment of their teaching contributions, as shown in Figure 1. Teaching point contributions were present in 82% of cases as assessed by residents versus 74% of cases as assessed by attendings ($P=.001$), diagnosis contributions were present in 44% of cases as assessed by residents versus 34% as assessed by attendings ($P=.001$), therapy contributions in 61% of cases as assessed by residents versus 55% as assessed by attendings ($P=.02$), and HCM in 19% of cases as assessed by residents versus 15% as assessed by attendings ($P=.04$).

Figures 2 and 3 demonstrate that both resident and attending assessments of attending contributions to teaching

FIGURE 1. Attending and resident assessment of contributions. The attending response frequency is shown as the black bar and the resident response frequency is shown by the white bar.

FIGURE 2. Resident assessment of attending contributions by year of training. Resident postgraduate year 1 (PGY1) response frequency is shown by the black bar, PGY2 response frequency is shown by the grey bar, and PGY3 response frequency is shown by the white bar.

points, diagnosis, therapy, and HCM progressively decreased with each increasing year of resident experience. For example, teaching point contributions were reported by first-year postgraduate residents (PGY1) to be present in 91% of cases, by second-year postgraduate residents (PGY2) in 91% of cases, and by third-year postgraduate residents (PGY3) in 74% of cases ($P=.001$), and therapy contributions were reported to be present in 80% of cases (PGY1), 70% of cases (PGY2), versus 48% of cases (PGY3) ($P=.001$). Attending perceptions were similar with teaching points reported present in 85% of PGY1, 78% of PGY2, versus 66% of PGY3 ($P=.001$), and therapy contributions present in 70% PGY1, 53% PGY2, versus 49% of PGY3 ($P=.001$).

Primary care and categorical residents assessed attending teaching contributions comparably for all categories. However, attendings felt they made more contributions to therapy and HCM in categorical than primary care house officers (RX 58% vs 47%, $P=.03$ and HCM 18% vs 8%, $P=.004$). Male and female residents assessed attending contributions to diagnosis, therapy and HCM comparably, however, female residents more frequently than male residents perceived that attendings made teaching points (88% vs 78%, $P=.02$). In contrast, attending perceptions of contributions were generally greater for male than female residents. Attendings perceived teaching contributions were made during 77% of male versus 69% of female

FIGURE 3. Attending assessment of contributions by resident training year. Attending assessment of frequency of teaching contributions to resident postgraduate year 1 (PGY1) is shown by the black bar, to PGY2 by the grey bar, and to PGY3 by the white bar.

FIGURE 4. Residents felt attendings contributed more to teaching and diagnosis when attendings evaluated patients. The frequency of teaching contributions when attendings personally evaluated patients is shown by the black bar, and the white bar indicates frequency of teaching contributions when the attending did not see the patient.

resident teaching encounters, $P=.07$, and that diagnosis contributions were made during 40% of male versus 25% of female resident teaching encounters, $P=.003$. Both residents and attendings felt that there were rarely differences between each other with regard to the overall diagnosis or therapy plan for patients (data not shown).

In 8% of encounters, either residents or attendings felt that personal evaluation of the patient by the attending was needed. Figure 4 shows the results of the questions in this circumstance. When attending evaluation was deemed necessary, both residents and attendings felt that attendings made more contributions to teaching points (97% vs 82%, $P=.02$) and diagnosis (74% vs 44%, $P=.001$) than in encounters when attendings did not see the patient.

The results of the subcategories for each of the 3 "yes/no" questions were reviewed to assess attending contributions more specifically. The most frequent subcategories of attending contributions as rated by residents were suggestions regarding stopping, starting, or changing medications, suggestions regarding additional tests or diagnostic procedures, and suggestions regarding additional history, diagnoses, or changes in monitoring/follow-up. In several of these subcategories, residents perceived that attendings made teaching contributions significantly more frequently than attendings self-assessed their contributions. Residents perceived that recommendations for additional history and referral suggestions were significant attending teaching contributions ($P=.005$). Additionally, recommendations for changes in monitoring/follow-up were rated as significant attending teaching contributions ($P<.01$).

DISCUSSION

Attending physicians are perceived to make frequent contributions to house officer ambulatory education, but generally underestimate themselves. This underestimation is similar to a study by O'Malley, which found that learners (interns and third-year medical students) were significantly more likely than their teachers to rate the overall educational value of an encounter as "excellent" or "very good."⁹ The reason for this underestimation is unclear, but there are several possible ex-

planations. First, in our study, residents perceived more commonly than attendings that attendings provided teaching contributions by suggesting additional history, referrals, and changes in patient monitoring/follow-up. Perhaps attendings think these activities are part of routine patient care management, rather than teaching contributions. Additionally, attendings may underestimate the effects of role modeling professional behavior (although residents were not specifically questioned on this issue).¹⁰ Finally, attendings may not recognize that confirmation of a resident's management plan is a teaching contribution. This possibility is supported by findings in a study by Laidley evaluating whether attendings recognized residents' learning need.¹¹ The learning need most commonly identified by residents in the study by Laidley was "validation of impression and plan," which they chose more often than "differential diagnosis" or "verifying a physical finding."¹¹ This suggests that an attending confirmation of patient management could be considered a teaching contribution by residents. Future studies could specifically query residents and attendings on these issues to explore whether they are significant teaching contributions, which in turn would help facilitate understanding resident ambulatory education.

Both residents and attendings perceived that attendings contributed less as residents advanced in their training. Intuitively, this is not surprising. Both attendings and residents reported that teaching contributions were most frequently to therapy followed by diagnoses, and as residents expand their knowledge base with training, they would need less attending input into these patient management issues. However, it may also mean that attendings expect that senior residents need less teaching, and thus they provide less teaching than necessary. Xakellis¹² found that mean faculty teaching time in an ambulatory clinic was greater for first-year residents than third-year residents. Attendings may need to develop teaching strategies for additional educational areas of emphasis that could be directed to senior residents (e.g., evidence-based medicine, prevention, time management, cost-containment, and managed care practices). Additionally, senior residents could be provided opportunities to teach and supervise others in ambulatory medicine settings (much as they teach in the inpatient setting), as it is a widely recognized belief that teaching others improves self-learning.

It is possible that resident-attending continuity with each other affected perceptions of teaching by year, in that the longer that residents and attendings worked with each other, the more likely they both assumed that the resident knew all they needed to know about their patient. Unfortunately, we were unable to retrospectively track the amount of continuity residents had with specific attendings over their training. However, residents did not present to the same attending every encounter, and may not have worked with the same faculty their entire 3 years because of changes in clinic days and attending composition.

Resident training track and gender had some affect on attending self-perceptions of their teaching contributions. Perhaps attendings assumed that primary care residents have more experience with HCM and therapy of outpatient problems, and felt they needed to contribute less. The differences in teaching perceptions related to resident gender are more difficult to explain. Gender differences have been found in medical school grading and in numerical scores from the American

Board of Internal Medicine evaluation forms.¹³⁻¹⁵ Additionally, differences in teaching related to the gender composition of the teacher-student pair have been found during ambulatory patient encounters.¹⁶ However, we did not collect gender data on the attending-resident dyad for each of the encounters we studied. This would be another interesting area of study.

Bedside evaluation of the patient by the attending significantly increased the frequency of teaching contributions, although it is interesting to note that only a small number of cases (8%) were deemed necessary for the attending to see. While bedside teaching is proposed to have many benefits including the teaching of history and exam skills, humanism, professionalism, communication, and role-modeling, estimates are that it occurs only 15% to 25% of the time, and that direct observation of learners occurs less than 5% of the time.¹⁷ The reasons for bedside teaching decline is not clear, although previous articles suggest that while patients value bedside teaching, residents are more uncomfortable with bedside presentations, and there are many attending barriers including concerns over lack of experience, time, and skills.^{17,18} We do not have data on the types of patient encounters that necessitated personal attending-patient interaction, whether the teaching contributions of attending patient evaluations were confined to certain types of patient problems, or whether the desire for bedside evaluation was driven by the resident or attending. We also do not have data on whether the increased perception of teaching was due to greater time spent by the attending with the house officer, or whether a focus on history, exam, or something else contributed to their teaching benefit. These would all be useful areas to explore. However, our overall results are consistent with those of Gennis, who found that outpatient teaching was influenced by whether the attending saw the patient or not.¹⁹ Whether an attendings underestimation of their teaching contributions has any impact on their frequency of bedside teaching also cannot be determined from our study. However, perhaps attendings would teach from the bedside more enthusiastically and frequently if they realize how valuable their contributions are. Useful techniques to help facilitate attendings confidence in bedside teaching have been published.^{20,21} Our data underscore the educational importance of attending bedside sessions.

A number of limitations of our study should be mentioned. The study took place at a single institution and ambulatory clinic site, with a relatively modest number of house officers and attendings. However, encounters were spread out among the 14 attendings, rather than a few attendings precepting the majority of cases. Patients were of lower income and education, and there were more minority patients than in the general population. Therefore, our results may not be generalizable. Additionally, we developed our own questionnaire, which relied on self-reported perceptions of teaching contributions during unique, nonreproducible encounters. Without doing independent observations of teaching contributions, the instrument could not be formally evaluated for validity or reliability. While the domains of teaching contributions (diagnosis, therapy, HCM) were reasonable, there may have been overlap across domains in some instances and misclassification of some teaching points. House officers and attending physicians were aware that research studies were ongoing and that their clinical behavior was under scrutiny. This may have influenced the frequency of reported teaching contributions. Our study was not designed to assess the educational impact

of attending teaching on residents' skills or patient outcomes. Finally, visit duration, time pressure, number of interruptions, continuity of resident with attending (number of clinic sessions worked together), and the ratio of residents to attending all may have affected our results. We did not gather information on these factors.

CONCLUSIONS

Attending physicians are perceived to make significant contributions to house officer ambulatory education and patient care, which they generally underestimate. Their bedside evaluation of patients aids in diagnosis and teaching. Resident variables affect perceptions of attending contributions. Further studies are necessary to measure more precisely aspects of ambulatory teaching effectiveness, such as: assessing attending educational impact on resident learning outcomes and skills; why certain encounters or teaching situations are effective for both attending and resident; and what are common situations in which the attending should see the patient to aid in diagnosis. Finally, to maintain teaching contributions, attendings could consider emphasizing other areas of ambulatory practice to residents as they mature in their training.

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