Ambulatory Versus Inpatient Rotations in Teaching Third-Year Students Internal Medicine

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We studied 63 randomly selected third-year students who split their 10-week medicine clerkship between ambulatory and inpatient components. Compared with their inpatient experience, during the ambulatory rotation, the 63 students felt more like doctors, more responsible for patients, and more able to know and help their patients. Students reported that ambulatory attending staff appeared happier and less stressed, and did not embarrass them as frequently. Compared with their 619 "inpatient" classmates, these 63 "ambulatory" students scored as well on the medicine examination, and were as likely to receive honors (44% vs 41%), and to choose internal medicine residencies (35% vs 34%). In conclusion, students experienced better relationships with their patients and teachers during the ambulatory rotation, which was academically comparable to the inpatient experience.

KEY WORDS: medical student; medical education; ambulatory rotation; medical clerkship; inpatient rotation.

J GEN INTERN MED 1998;13:327-330.

Shifting medical student education in internal medicine (IM) from the inpatient to the outpatient setting is an appropriate response to the parallel shift in clinical practice.¹ However, compared with the rich tradition of bedside teaching in hospital-based clerkships, ambulatory care sites are relatively new to the medical education enterprise. Reports of ambulatory clerkships suggest that academically rigorous programs can provide students with an adequate knowledge base while broadening the curriculum to include ambulatory-specific topics.²⁻⁴ However, we lack comprehensive evaluation data. This has raised concerns that ambulatory medical education is being embraced before its educational consequences are fully understood and the curricula are rigorously evaluated.⁵

Between 1991 and 1995, New York University (NYU) School of Medicine piloted an ambulatory IM rotation for randomly selected third-year students. These students split their 10-week IM clerkship in half: an established inpatient rotation, and a new ambulatory rotation at the Gouverneur Diagnostic and Treatment Center. We de-

scribe this ambulatory IM rotation and evaluate students' perceptions and educational outcomes compared with the inpatient rotation.

METHODS

Description of the Ambulatory Rotation

Four randomly selected students (out of 30-40) per quarter were assigned to spend half their IM clerkship at Gouverneur, a municipal, primary care clinic affiliated with NYU School of Medicine. The rotation consisted of six, half-day clinical sessions in the primary care IM clinic. For each patient, the student completed a history and physical examination, developed a differential diagnosis and problem list, and designed a management plan. The student presented each case to a faculty preceptor who reviewed the clinical data and the student's clinical reasoning, and did a focused clinical evaluation. As case loads grew, students saw patients for follow-up visits. These core clinical learning experiences were supplemented with weekly rounds with the chief of medicine, acute care walk-in clinic, an HIV minicourse,⁶ and experience in the ear, nose, and throat, rheumatology, dermatology, and breast clinics.

Twice a week, each student gave a 10-minute talk about a clinical issue raised in the course of patient care. To address medical interviewing skills and psychosocial aspects of medicine, each student was videotaped interviewing a patient. Tapes were reviewed in a weekly conference. Finally, students attended lectures with their inpatient classmates at NYU each week.

Each student met weekly with an assigned faculty mentor to review goals and objectives for the rotation and to create a learning contract,⁷ merging student goals with faculty expectations. In addition, faculty mentors reviewed write-ups, directly observed students' physical examinations, monitored students' progress, conveyed collective feedback to the students, and wrote the final evaluation, which was incorporated into the final clerkship grade.

Evaluation of the Rotation

At the conclusion of the 10-week clerkship, the ambulatory rotation students completed a confidential, self-administered questionnaire. We asked students to compare four aspects of their inpatient and outpatient experiences: (1) relationships with patients, (2) relationships with teachers, (3) perceived value of the educational experience, and (4) learning of clinical skills. These four as-

Received from the Department of Medicine, Gouverneur Diagnostic and Treatment Center, New York, NY.

Presented at the Society of General Internal Medicine Annual Meeting, Washington, D.C., April 27-29, 1994.

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pects were chosen because they represented critical concerns students have expressed about IM.⁸ Students were asked to indicate whether the ambulatory rotation was *less than*, *the same as*, or *more than* the inpatient experience with regard to these aspects. Questionnaire items were developed, pilot tested with medical students, and refined for clarity.

The dean's office supplied IM examination scores and final clerkship grades for all students during the study period. The IM examination was based on Part II of the National Board of Medical Examiners test. Residency match data were used to determine career choice. An IM career choice was defined as 3-year categorical IM, primary care IM, or medicine-pediatrics residencies. A primary care career was defined as IM, pediatrics, or family medicine residencies.

We summarized survey responses as percentages, illustrated with histograms. We used a two-tailed Student's *t* test to compare mean final examination scores of students who did and did not have an ambulatory rotation.

We used χ^2 tests to compare students who did and did not have the ambulatory rotation with respect to the proportion who received an A (highest grade), and the proportions who chose IM or primary care careers. We determined if the examination scores (*t* test) and final grades or career choice (χ^2 tests) were associated with student gender, race or ethnicity, or medical school class, or whether the ambulatory rotation was taken during the first or last half of the clerkship.

RESULTS

Sixty-three (9%) of 682 third-year students participated in the ambulatory rotation over the 5-year study period. Their mean age was 25 years, 35% were women, and 57% were white. The 63 students were similar in background to their 619 classmates who did not participate. Completed questionnaires were obtained from 59 students.

Compared with their inpatient rotation, during the ambulatory rotation students reported more direct re-

FIGURE 1. Student comparisons of the ambulatory and inpatient rotations with regard to (a) student-patient relationships, (b) student-teacher relationships, (c) perceived values of the educational experience, and (d) clinical skills obtained. Black bars indicate that the ambulatory rotation had more of the characteristic than did the inpatient rotation; hatched bars, the same; and white bars, less.

sponsibility for patient care, and more opportunities to feel like doctors (Fig. 1a). They felt better able to help their patients, they got to know their patients better as people, and they had more satisfying relationships with their patients than during the inpatient rotation.

Student-teacher relationships were also seen more favorably during ambulatory compared with inpatient rotations (Fig. 1b). During the ambulatory rotation, students identified more and had more satisfying relationships with their attending physicians, and felt less embarrassed or intimidated. Students also felt attending staff appeared somewhat happier and less stressed in the ambulatory compared with the inpatient setting.

More students found the ambulatory rotation as intellectually stimulating as their inpatient rotation, and most felt the teaching during the ambulatory rotation better met their needs (Fig. 1c). Overall, most students found the ambulatory rotation as or more educationally satisfying than the inpatient rotation.

Questions addressing clinical skills obtained were added halfway through the evaluation (Fig. 1d). Most students reported that compared with the inpatient rotation, the ambulatory rotation taught them more about clinical management, differential diagnosis, history taking and physical examination skills, and technical skills.

Students who had the ambulatory rotation during the second half of the clerkship (73%) viewed the ambulatory component even more favorably for two items. Among second-half students, 95% reported more opportunities to feel like a doctor, compared with 69% of first-half students ($p = .005$); and 81% of second-half students reported feeling less embarrassed by attending physicians, compared with 54% of first-half students ($p = .01$). There were no other differences found in perceptions when analyzed by timing of the rotation, and none when analyzed by gender, race or ethnicity, school class, or career choice.

Table 1 summarizes the outcome data. None of the differences was statistically significant. The ambulatory rotation students performed as well on the written examination as their classmates, and were just as likely to receive an A grade and to choose IM or primary care careers. There were no differences found in examination scores, grades, or career choices by student gender, race

or ethnicity, school class, or the half of clerkship in which the ambulatory component was taken.

DISCUSSION

In this study, an ambulatory rotation in IM was highly valued by third-year medical students. They perceived learning in the ambulatory setting as educationally comparable and more satisfying than their traditional, inpatient ward experience. Students were able to develop more satisfying relationships with both their patients and their teachers during the ambulatory rotation than while on the wards. Students greatly appreciated the opportunity for direct patient care. Seeing patients on their own as the first contact motivated students to take responsibility for patient care as well as for their own learning. Finally, ambulatory students did as well academically and were as likely to enter IM careers as their classmates. This and a prior study suggest that ambulatory training has the potential to address the growing concerns about traditional, inpatient clerkships, which have disillusioned students about IM as a career.⁹

Our study and experience support the importance of what others have identified as critical features of good ambulatory education¹⁰⁻¹²: That is, using direct observation and ongoing formative feedback to emphasize the students' role in direct patient care, focus on clinical skills as well as knowledge, encourage decision making and responsibility with graduated autonomy, and run faculty development activities on outpatient precepting skills.

The findings of this study are limited by its modest sample from a single medical center, and by the lack of concurrent controls for student perceptions. Students were selected to participate in the ambulatory rotation randomly, and therefore comparisons of grades, scores, and career choices with their classmates are likely to be unbiased.

Recent work has redefined a core medicine clerkship curriculum that emphasizes the mastery of basic generalist competencies, and requires both inpatient and outpatient experiences.¹³ In order to preserve excellence in medical education in the rapidly evolving health care environment, more studies are needed to refine and evaluate

Table 1. Association of Ambulatory Rotation with Student Performance and Career Choice*

Educational Outcome	Students with Ambulatory Rotation (n = 63)	Students without Ambulatory Rotation (n = 619)
Mean score on final exam	483	478
Final medicine exam grade = A, %	44	41
Internal medicine residency, %	35	34
Primary care residency, %	44	45
Primary care internal medicine residency, %	5	3

*None of the differences was statistically significant.

the essential components of effective medical clerkships in a variety of settings.

The authors thank the ambulatory rotation faculty: Anne Dembitzer, Kathleen Hanley, Cynthia Kaufman, Barbara Montana, Daniel Pomerantz, William Salazar, David Stevens, Selina Siu, Sheila Tapp, and Sandra Zabar. The authors also thank Maria Negron and Ella Mikles for administrative support and JoAnne Earp for manuscript editing.

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