

Continuity, Family Involvement, and Clinical Content in a Year-Long Ambulatory Care Clerkship

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Entries in student logbooks for the Ambulatory Care Clerkship at the Michigan State University College of Human Medicine were tabulated by microcomputer for 38,430 patient encounters in five community campuses in 1985 and 1986, and by hand for 32,182 patient encounters in Grand Rapids from 1983 to 1987. The repeat visit rate recorded toward the end of the clerkship by students in family practice settings was approximately 60% of the rate recorded by students taking the clerkship with internists or pediatricians. Students in family practice and in pediatrics had the same degree of exposure to patient families; however, family exposure in internal medicine and in pediatrics was limited to other family members of the same generation as the patient. Distributions of the kinds of patient problems seen were distinctive by specialty and were stable across 5 years.

The Ambulatory Care Clerkship in the College of Human Medicine at Michigan State University is a required half-day per week experience that third-year medical students take concurrently with their regular block clerkships. Each Ambulatory Care Clerkship (ACC) student is paired with a physician preceptor and must attend 30 office practice sessions with that preceptor. Students may select preceptors in family practice, internal medicine, or pediatrics. The Department of Family Practice is responsible for administration of the clerkship.

The one-to-one relationship between student and physician is regarded as an important component of this clerkship. Most preceptors are volunteer faculty who teach in their private practice offices. The remainder are residency or medical school faculty who likewise volunteer their teaching time. It is fortunate that the College of Human Medicine distributes its students for clinical clerkships in several community campuses, so that the teaching load absorbed by the primary care physicians in any one community is not too great. The Grand Rapids community campus, for example, usually takes about 28 students from each class of approximately 100 students. Thus 28 precep-

tors must be recruited for that community each year. The other community campuses of the College of Human Medicine (Flint, Kalamazoo, Lansing, Saginaw, and the Upper Peninsula) each take fewer students per class. The Upper Peninsula campus of the College of Human Medicine follows an alternative curriculum for the clinical years and will not be further discussed here.

The educational aims and curriculum of the Ambulatory Care Clerkship have been described elsewhere.¹ In amplification of what has already been published about the course, it should be noted that the ACC has characteristics of both a preceptorship and a clerkship. Physician-teachers are designated as preceptors, and much of their week-to-week teaching of the ACC students is in the individualized master-apprentice style that is characteristic of preceptorships. On the other hand, there is a written syllabus for the course that is followed by all students and preceptors in all disciplines in all community campuses. The clinical instruction in the 30 office sessions is supplemented by standardized readings and lectures. ACC students are evaluated through a uniform mid-clerkship exercise and a final examination that includes a case write-up, an oral examination, and a multiple choice test on the content of the course readings. The Ambulatory Care Clerkship thus crosses the boundaries of the categories of clinical courses—preceptorships and clerkships—specified by the Society of Teachers of Family Medicine.^{2,3}

This article is a comparative study of the experiences of students who have taken the ACC under the aegis of fam-

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ily physicians, internists, and pediatricians. For each of these three primary care specialties, the ACC students' experiences are reviewed in terms of (1) continuity of care, (2) involvement with patient families, and (3) problems presented by the patients whom the students saw in the office setting.

METHODS

Students in the ACC record their patient encounters in a pocket-size log. Information about each patient seen is written on a separate line of the log. The student checks categories of visit type—*I* for a patient whom the student has not seen before, *R* for a patient whom the student has seen before, *F* for patients for whom the student has previously seen other family members of the same generation (brother, sister, wife, husband), or *F** for patients for whom the student has previously seen other family members of a different generation (parent, child). The students are instructed to check either *I* or *R* for every patient seen, since each encounter can be classified as either an initial visit or as a return visit from the student's viewpoint. If the student has not seen any other members of the patient's family, then neither *F* nor *F** will be checked. Students are told to record all problems dealt with at the office visit, without any restriction as to the nomenclature or classifications to be used in describing patient problems.

Students also record procedures observed, assisted, or performed on each patient visit. The content of the logbook column for recording procedures and involvement is not dealt with in this report.

Logbook data were tabulated in two ways for this study. For students taking the ACC in 1985 and 1986 in all downstate community campuses (Flint, Grand Rapids, Kalamazoo, Lansing, and Saginaw), all logbook entries (38,430) were entered into a microcomputer database. Output files were generated from that database for statistical analysis on a mainframe computer. Independently, one community coordinator (L.E.E.) hand tabulated 32,182 entries from the log books of the Grand Rapids students for the years 1983 through 1987, creating a summary of the clerkship experience of each student. The tabulation for 136 students who took the clerkship at the Grand Rapids campus includes tallies of patient problems, sorted into 20 categories. All of the data reported here on the types of clinical problems seen by clerkship students pertain to the Grand Rapids campus only, since patient problems were not entered into the microcomputer database for the years reported. For all items other than patient problems, data for Grand Rapids were drawn from the microcomputer database described above.

To provide insight into the dynamics of the clerkship, several of the variables derived from the microcomputer

database were plotted against clerkship session. To create these plots, the date of each patient encounter was associated with a session number from 1 to 30. Some students attended more than the required 30 office sessions; data for sessions beyond the 30th were ignored when variables were plotted against clerkship session.

RESULTS

Demographics

The total number of clerkship students and their distribution across specialties were similar in most of the community campuses in 1985 and in 1986. Of the total of 185 students whose logbook data were recorded in the microcomputer database (92 for 1985 and 93 for 1986), 72% took the clerkship in family practice, 23% in internal medicine, and 5% in pediatrics. One community campus (Kalamazoo) placed a markedly higher proportion (38%) of students with internists, but the variation in specialty of placement by community did not achieve statistical significance (chi-square test).

In Grand Rapids, as in the other community campuses of the College of Human Medicine, there has been a trend toward placing an increasing proportion of ACC students with family physicians; 62% of the Grand Rapids students had family practice placements in 1983, whereas the proportion had risen to 80% by 1987. Across the 5 years from 1983 to 1987, 71% of the Grand Rapids students were placed with family physicians, 19% with internists, and 10% with pediatricians.

In all the campuses taken together for 1985 and 1986, students placed with family physicians saw an average of 7.3 patients per half-day clerkship session (SD = 2.6, N = 134), while students in internal medicine saw 5.4 patients per session (SD = 2.5, N = 42), and students placed with pediatricians recorded 6.2 encounters per session (SD = 2.7, N = 9). The mean numbers of patient encounters recorded by each student in the entire clerkship were 222, 168, and 183 in family practice, internal medicine, and pediatrics, respectively. (Because of the variation in the number of sessions recorded per student, these are not exact multiples by 30 of the average number of patients seen per session.) Analysis of variance shows that the differences among the mean number of patients per session were significant ($P = .003$).

Patients seen in family practice and internal medicine had a similar sex distribution (59% and 61% female, respectively). Only 46% of the patients seen in pediatrics were female.

Continuity

Staff in the precepting physicians' offices are asked to schedule return visits for patients seen by the student on

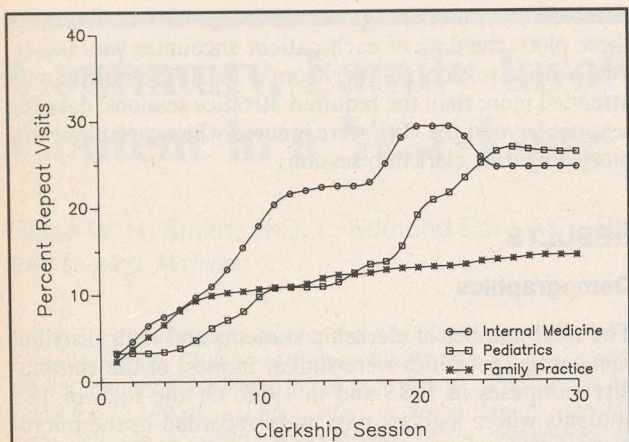


Figure 1. Repeat visit rates by session in the Ambulatory Care Clerkship, based on data for all downstate community campuses for 1985 and 1986 combined. A resistant smoothing procedure in MINITAB (MINITAB, Inc, State College, Pa) was used to smooth the means for each specialty; the origin of the hump in the internal medicine curve is unknown.

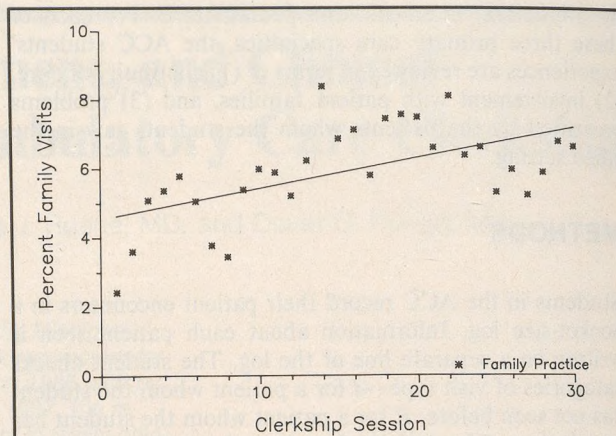


Figure 2. Family contact by clerkship session in the Ambulatory Care Clerkship in family practice, based on data for all downstate campuses for 1985 and 1986 combined. Percent family visits is the sum of visits per session by patients for whom the student had seen other family members of the same or of a different generation, divided by the number of patients seen in that session, and with the result multiplied by 100. The raw, unsmoothed means for each session number are shown as the data points. The regression line corresponds to the equation $\text{Percent Family Visits} = 4.54 + 0.088 \text{ Session}$; adjusted R^2 for the regression is 29.6%

the same half-day of the week to provide the student with an experience of continuity of care. The least degree of continuity was achieved in family practice, where 11.1% of the patients had previously been seen by the ACC students during this clerkship. Internal medicine practices were most successful in providing continuity, with a repeat visit rate of 21% for 1985 and 1986. The overall repeat visit rate in pediatrics was intermediate at 15.5%.

When the repeat visit rate is examined dynamically (Figure 1), it is apparent that by the end of the clerkship about 14% of the encounters in family practice were with patients the student had seen before, while in both internal medicine and pediatrics, the repeat visit rate from the 25th to the 30th session was approximately 25%.

Family Contact

None of the data for family contact were normally distributed. For each specialty zero was the modal value of the number of patients for whom the student had previously seen other family members of the same or of a different generation. In this section, accordingly, medians and ranges are reported rather than means and standard deviations.

Given the age-specific definitions of the practice populations in pediatrics and internal medicine, it is not surprising that students placed in these specialties recorded very few encounters with patients for whom they had previously seen another family member of a different generation. The median of such contacts in internal medicine and in pediat-

rics was zero (range: 0 to 6 in internal medicine, and 0 to 3 in pediatrics). For students placed with family physicians, the median of encounters with family members of a different generation was 2, with a range from 0 to 49.

The largest median of encounters with patients for whom the student had previously seen another family member of the same generation was in pediatrics (median = 8, range: 0 to 31). Family practice was second in same-generation family encounters, with a median of 3.5 and a range of 0 to 36. The number of same-generation family encounters was lowest in internal medicine, where the median was zero and the range was 0 to 35.

The sum of the number of patients for whom the student had previous contact with other family members of the same or of another generation can be divided by the number of patients seen to derive an indicator of student involvement with patient families in the ACC. There was a trend toward increasing involvement with patient families in family practice (Figure 2). The comparable plot of percentage of family encounters in internal medicine (not shown) is essentially flat, indicating no trend toward increasing contact with patient families as the clerkship progressed. The data for percentage of family encounters in pediatrics are highly variable when plotted against clerkship session, perhaps because of the small sample size of nine students in pediatrics. The overall percentage of fam-

TABLE 1. RANK ORDER OF TYPES OF PROBLEMS SEEN PER STUDENT IN FAMILY PRACTICE, GRAND RAPIDS CAMPUS, 1983 TO 1987

Rank	Problem	Average 1983-1987*	Rank 1983	Rank 1984	Rank 1985	Rank 1986	Rank 1987
1	Musculoskeletal	35.28	1	2	2.5	3	4
2	Health maintenance, physical examination	34.83	2	1	2.5	4	3
3	Dermatologic	34.64	6	6	1	2	1
4	Ear-nose-throat	33.79	3	5	4	1	2
5	Circulatory, cardiac	26.35	5	7	6	5	5
6	Infection, not specified	23.49	4	4	7	7	7
7	Trauma	18.04	12	3	5	12	10
8	Obstetrics	17.06	10	8	9	6	6
9	Gastrointestinal	15.83	8	10	8	8	8
10	Respiratory	13.03	7	13	13	10	11
11	Psychosocial	12.73	11	9	11	9	9
12	Endocrine-metabolic	12.01	9	11	12	11	12
13	Genital	10.48	13	12	10	13	13
14	Nervous system	5.74	14	15	14	16	15
15	Urinary	5.68	15	16	15	14	14
16	Other	5.04	16	14	16	17	16
17	Eye	4.41	17	17	17	15	17
18	Hematologic, lymphatic	1.99	18	19	18	18	19
19	Neoplasm	1.81	20	18	20	19	18
20	Mental disease	1.34	19	20	19	20	20

*The mean number of problems of this type that were recorded per Ambulatory Care Clerkship student by all Grand Rapids students from 1983 to 1987.

ily encounters, disregarding clerkship session, was the same in family practice and pediatrics (medians of 4.2% and 4.1%, respectively, with ranges of 0% to 26% in family practice and 0% to 16% in pediatrics). In internal medicine, the median percentage of encounters with patients for whom the student had seen other family members was 0.7, with a range of 0% to 12.8%.

Clinical Content

The Grand Rapids students recorded an average of 1.43 problems per patient encounter. There were distinct differences among the specialties in the numbers of problems per patient that the students recorded. Students placed with internists in Grand Rapids recorded an average of 1.97 problems per encounter (SD = .58, N = 26). In family practice, ACC students in Grand Rapids recorded 1.32 problems per encounter (SD = .15, N = 96), while for pediatrics the average number of problems per patient was 1.21 (SD = .13, N = 14). The *F* ratio for analysis of variance for these means was 58.16, with 2 degrees of freedom and a *P* < .0001.

Across the 5 years for which logbook data were hand-tallied for the Grand Rapids campus, there was a consistent ranking by physician specialty of the relative frequency of types of patient problems. These problems are shown in Tables 1, 2, and 3. Rank order correlations be-

tween the yearly distributions of patient problems seen in each specialty are high. For family practice, the mean Spearman correlation coefficient for the 10 combinations of years shown in Table 1 is .92. Comparable means of rank order correlation coefficients for internal medicine and pediatrics are .89 and .92.

Students taking the clerkship in family practice have seen patients with musculoskeletal problems, health maintenance and physical examination problems, dermatologic problems, and ear, nose, and throat problems. The typical constellation of patient problems in internal medicine has been different, with a predominance of circulatory and cardiac problems, endocrine and metabolic problems, musculoskeletal problems, and gastrointestinal problems. In pediatrics yet a different ranking has prevailed, with health maintenance and physical examinations, ear, nose, and throat problems, infections, and dermatologic problems heading the list.

For family practice, the five most frequently listed categories of patient problems account for 53% of the total number of problems recorded per student during the clerkship. The five most frequently listed categories in Table 2 account for 63% of the total recorded per student in internal medicine. For students placed with pediatricians, the five most frequently listed categories comprise 80% of the problems recorded.

Lectures and assigned readings for the ACC have been

TABLE 2. RANK ORDER OF TYPES OF PROBLEMS SEEN PER STUDENT IN INTERNAL MEDICINE, GRAND RAPIDS CAMPUS, 1983 to 1987

Rank	Problem	Average 1983-1987*	Rank 1983	Rank 1984	Rank 1985	Rank 1986	Rank 1987
1	Circulatory, cardiac	95.87	1	1	1	1	1
2	Endocrine, metabolic	50.53	4	2	2	3	3
3	Musculoskeletal	48.45	3	3	3	2	2
4	Gastrointestinal	32.57	5	5	4	4	4
5	Psychosocial	24.07	10.5	4	7	5	7
6	Health maintenance, physical examination	23.02	2	8.5	6	11	5
7	Dermatologic	20.21	6.5	6	5	6	8
8	Respiratory	16.35	10.5	8.5	9	7	6
9	Genital	14.85	14	7	8	9	9
10	Ear-nose-throat	13.97	9	11	11	10	10
11	Nervous system	13.75	8	10	10	8	11
12	Infection, not specified	9.30	6.5	12	15.5	16.5	16
13	Urinary	7.88	12	13	12	14	14.5
14	Neoplasm	6.61	16.5	14	13	13	13
15	Trauma	6.10	18	17	14	12	14.5
16	Other	5.81	15	16	17	15	12
17	Hematologic, lymphatic	4.73	16.5	15	15.5	16.5	18
18	Eye	3.87	13	18	19	18	17
19	Obstetrics	1.74	19	19	18	20	19
20	Mental disease	0.86	20	20	20	19	20

*The mean number of problems of this type that were recorded per Ambulatory Care Clerkship student by all Grand Rapids students from 1983 to 1987.

defined and continue to develop around the clinical content displayed in Tables 1, 2, and 3.

DISCUSSION

The total time that an ACC student spends in a physician's practice, 30 half-days, is equivalent to 3 weeks of full-time attendance at the rate of 10 half-days per week during a block rotation. The amount of exposure to continuity of care in family practice in this clerkship, as measured by the percentage of visits that are return visits, appears to be comparable to continuity in a 4-week block in an office-based family practice clerkship. Beasley, for example, found that by the fourth week of a 12-week block clerkship in family practice offices, 16% of the patients seen by the students were coming for repeat visits.⁴ Considering that the ACC students spend the equivalent of only 3 weeks in the office, the return visit rate of 14% in family practice at the end of this clerkship compares favorably with exposure to continuity in a block clerkship.

Two factors act in opposite directions to influence the degree to which continuity of care can be experienced in the ACC. On the one hand, the clerkship is scheduled over a much longer period than are the standard block rotations (7 months to a year for the ACC vs 2 to 3 months for block clerkships). Over this longer span of time, there is a greater

probability that a patient will come in to see the physician again, whether for a return visit for the same problem or for a new problem or episode of illness. On the other hand, the ACC student is present in the office only one half-day per week, which amounts to about one tenth of the time that the office is open. Unless patients seen by an ACC student are scheduled to come back on that same half-day, and unless they agree to come in then, their return visits to the office may be missed by the student assigned to the practice.

By the end of this clerkship the repeat visit rate was about the same in internal medicine and in pediatric settings, and was about 1.8 times the rate observed in family practice. The commonsense explanation for this finding is that internists see many older patients who come in periodically for monitoring of chronic illnesses, and that the children seen by pediatricians are (1) prone to frequent episodes of acute illness, (2) asked to come back often for rechecks of problems such as otitis media, and (3) seen frequently in the first year of life for well-child care. The patient mix in family practice, on the other hand, is more evenly distributed.

Judging from the personal experience of the three physician authors as preceptors in this clerkship and from conversations with other precepting physicians, an ACC student sees between one third and one half of the patients who visit the preceptor during a given office session. There

TABLE 3. RANK ORDER OF TYPES OF PROBLEMS SEEN PER STUDENT IN PEDIATRICS, GRAND RAPIDS CAMPUS, 1983 TO 1987

Rank	Problem	Average 1983-1987*	Rank 1983	Rank 1984	Rank 1985	Rank 1986	Rank 1987
1	Health maintenance, physical examination	114.44	1	1	1	1	1
2	Ear-nose-throat	76.43	3	2	2	2	2
3	Infection, not specified	45.01	2	3	3	3	3
4	Dermatologic	24.09	4	4	4	4	4
5	Respiratory	13.04	5	5	6	8	5
6	Musculoskeletal	9.74	6	6.5	5	10	10
7	Gastrointestinal	9.72	7	6.5	7	5	6
8	Trauma	7.64	9	8	8.5	7	7
9	Psychosocial	6.59	8	10	8.5	9	13
10	Endocrine, metabolic	6.22	12	11.5	11.5	6	11
11	Other	5.54	17.5	9	11.5	11	8
12	Eye	4.66	10	15.5	10	12	12
13	Nervous system	4.54	11	11.5	15	13.5	9
14	Urinary	3.79	14	13	13.5	13.5	14
15	Genital	3.13	13	14	13.5	15	16
16	Circulatory, cardiac	1.95	15.5	17	16	17	15
17	Hematologic, lymphatic	1.42	15.5	15.5	18	16	18.5
18	Mental disease	0.84	17.5	18	19.5	19	17
19	Obstetrics	0.60	19	19.5	17	19	18.5
20	Neoplasm	0.10	20	19.5	19.5	19	20

*The mean number of problems of this type that were recorded per Ambulatory Care Clerkship student by all Grand Rapids students from 1983 to 1987.

are no official guidelines as to how the clerkship students' patients are to be selected, but it seems that the students are steered toward patients with clearcut problems and away from patients with complex problems. The ACC students are in their third year of medical training, so this selection is probably appropriate.

A criticism sometimes leveled at the ACC is that it draws students away from "interesting" and "really sick" patients in the hospital so that they can "see patients with coughs and colds and do camp physicals." The variety of clinical material summarized in the tables shows that this criticism is unjustified, especially in family practice.

Although students continue to elect internal medicine and pediatric sites for their ACC experience, the larger number of patients seen in family practice and their diversity in terms of age, generation, and clinical problems have influenced the majority of students to favor family practice sites for this clerkship. Family practice has provided them with a broad and balanced exposure to the universe of primary care.

Relative to the other two choices, family practice provides less experience with repeat visits. It seems that the concept and value of continuity of care in family practice must be taught more directly. An analysis of and approach to this problem has grown out of this ACC experience and is reported elsewhere.⁵

According to the testimony of many students, the most important aspect of continuity in this clerkship is the ongoing

relationship with the precepting physician and his or her office staff. Students say that they do not recognize the value of this at first. When they are about halfway through the ACC, they realize that they have immersed themselves in the subject matter and human relationships of one clinical discipline after another, abandoning each for the next. The practice to which they are assigned in the ACC becomes a clinical home to which they appreciate returning, and where they are appreciated to an increasing degree.

Acknowledgment

The system of 20 categories of patient problems shown in the tables was created by L. Edmund Eary, MD, who personally coded and hand tallied the Grand Rapids logbooks. Lawrence J. Baer, PhD, director of the Office of Research Consultation at the Grand Rapids Area Medical Education Center, provided statistical assistance.

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