

# Family Practice in the Predoctoral Curriculum: A Model for Success

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Fifty-five percent of students who began their medical education at the University of Minnesota, Duluth, School of Medicine have elected family practice residencies. A coordinated and concentrated approach to admissions and curriculum, emphasizing family practice as an institutional goal, is described and discussed. As the national average for graduating seniors seems to have stabilized at approximately 13 percent, this approach may serve as a model for other institutions which wish to increase the number of family physicians. Family physicians are heavily involved in all aspects of the teaching program. Institutional parameters which are necessary for success are briefly discussed.

The University of Minnesota, Duluth, School of Medicine admitted its first class of 24 medical students in September of 1972. The School of Medicine was established with funding from the state legislature with specific goals for the program based upon a series of studies on health manpower needs within the state of Minnesota. These goals were to attempt to alleviate the shortages of physicians in family medicine and in underserved rural and non-urban communities.

The school was established as a two-year basic medical sciences program, and the curriculum has been designed to reinforce the entering medical student's interest in and preference for family practice. Following successful completion of the two years in Duluth, students transfer to the medical school on the University of Minnesota's Twin

Cities campus for completion of their medical training. The university's Department of Family Practice and Community Health provides a supportive environment into which the Duluth students transfer, which has been immeasurably valuable in meeting programmatic goals.

## The Selection Process

From the school's inception it was clear that a great deal of attention had to be given to the type of student selected. With the goal of producing physicians for family practice in small communities, it was readily apparent that a simple academic selection model would not be adequate. In 1971, a study was initiated of the characteristics of physicians who had established and maintained small community practices and of a comparison group of Twin Cities general practitioners. Sixty general practitioners, in towns with populations of 10,000 or less, and 58 urban general practitioners

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**Table 1. Home Communities of Matriculants by Population and Type, School of Medicine, University of Minnesota, Duluth**

Year	0-1,500	1,501-3,000	3,001-5,000	5,001-13,000	13,001-25,000	25,001-40,000	40,001-60,000	60,001-100,000	>100,000	Small Medium Large			Suburban	Urban
										Town*	Town**	Town***		
1972	4	1	7	7	0	1	0	2	2	5	14	1	0	4
1973	3	4	1	7	6	1	0	0	2	7	14	1	0	2
1974	14	3	0	7	3	1	2	2	4	17	10	4	0	5
1975	9	7	2	8	3	1	0	2	4	16	12	3	1	4
1976	8	5	3	11	5	0	1	2	1	13	14	0	6	3
1977	11	7	1	13	7	2	1	4	2	18	15	3	7	5
1978	11	5	3	14	6	4	0	3	2	17	20	1	5	5
1979	10	7	7	5	5	4	2	6	2	17	13	7	3	8
Total	70	39	24	72	35	14	6	21	19	110	112	20	22	36
<b>Cumulative Percentage</b>	23	36	44	68	80	85	87	94	100	37	74	81	88	100

\*0-3,000 population  
 \*\*3,001-25,000 population  
 \*\*\*25,001-100,000 population

were interviewed during the summer of 1971; both groups were stratified by age. The interviews were structured and lasted approximately one hour. Data relevant to selection of students were extracted, as were data pertinent to the life-styles of physicians in a rural setting.

Selection factors were analyzed first. As in most studies of this type, it was found that the cluster of variables most closely associated with rural practice location included the size of the community in which the physician was raised. This factor was positively related to the length of time the individual had spent in a small community; the probability of a rural practice site increased if the physician had spent all of her/his childhood in such an environment. Another factor that emerged was the size of the community in which the physician's spouse (typically wife) had been raised; rural physicians tended to marry persons from smaller communities. The fathers of rural physicians were more likely to have been farmers or blue-collar workers than the fathers of urban physicians, who were more often white-collar workers or professional men.

Practice site selection factors were then assessed. Urban physicians were more likely to

have selected their practice location because it was their "home town" or because they had taken their internship or residency in that city. Rural physicians were more likely to be influenced by particular geographic features of the community, such as its size; or by medically related factors, such as physical facilities available or the structure of the practice arrangements. Rural physicians also felt it was important that they be quite autonomous, since opportunities to refer patients were perceived to be more limited outside of urban areas.

The results of this study were discussed extensively at the School of Medicine. While some factors identified could be of potential use in student selection, others were assessed as being of assistance in program design. The basic science curriculum could not be modified extensively to influence the career preferences of entering students. Clinical coursework was modified to include more materials pertinent to family practice. Wherever possible, the curricular structure and content were altered in an attempt to attain the goals set by the legislature.

The Admissions Committee surveyed existing literature on practice site location and specialty

Table 2. Academic Characteristics of Matriculants, School of Medicine, University of Minnesota, Duluth

Entry Year	Average Science GPA	Average Total GPA	Average Science MCAT	Average Math MCAT	Average MCAT*					
					Biology	Chemistry	Physics	Quant	Sci Prob	Reading
1972	3.20	3.20	531	561						
1973	3.38	3.34	575	610						
1974	3.35	3.44	592	604						
1975	3.42	3.44	601	619						
1976	3.54	3.54	619	633						
1977	3.60	3.63	630	637						
1978	3.55	3.59			8.75	9.70	9.12	9.39	9.33	9.44
1979	3.58	3.58			9.46	9.25	9.33	9.50	9.69	9.33

\*New Medical College Admission Test (MCAT) instituted in 1977. The subtests are in biology, chemistry, physics, quantitative, science problems, and reading

choice in a search for other parameters to aid in the selection of suitable students. Although the relationship between pre-entrance characteristics and practice location was not perfect, it was believed necessary to use the sociological, psychological, and demographic predictors as much as possible. Past academic experience and quality are obviously assessed intensively during the selection process, as are other traditional indicators of academic prowess, such as scores on the Medical College Admission Test (MCAT).

It was clear that community of origin would not be the sole selection criterion; attitudinal characteristics indicative of family practice preference are assessed during the admission process by two personal interviews with members of the Admissions Committee.

Over the first eight years, the school's matriculants have been distributed over all community sizes, although definite preferences for persons from rural and non-urban communities certainly exist.

Table 1 shows the size of the community of origin (home town) for the first eight entering classes combined. It can be seen that a preponderance of University of Minnesota, Duluth (UMD) students (80 percent) have been from communities numbering fewer than 25,000 in population. It is further obvious that a modest proportion of suburban/ur-

ban applicants were successful in gaining entrance; these people were judged to have excellent potential for family practice entry. Table 2 indicates that academic credentials of the matriculants were certainly of high quality; a trend is present toward higher entering grade point averages (GPA). Whether this is indicative of "grade inflation," a stronger applicant pool, or the ability of the school to matriculate "academically stronger" applicants as the school became better known is indeterminate.

### The Curriculum

As mentioned previously, every effort has been made to structure the academic and clinical curriculum in such a manner as to reinforce and continue the entering students' interest in and preference for family medicine and small community practice. A number of innovative facets of the curriculum were instituted with the entry of the first class and continue, although somewhat changed in format, through the 1979 year.

In the second year of the curriculum, a required course in Rural Life-Styles is offered. By the use of films, audiotapes, slide presentations, literature, and lecture/discussion, the students are introduced to the various elements of small community living. Since many of the students grew up

in this type of setting, it enables them to look at their familiar environment from a perspective which, for many of them, is enlightening. A small project is required of each student, and some have been of extremely high caliber. They have ranged from photographic essays of selected aspects of community life (eg, architecture of the farm) to critical essays of prototypic works of literature (eg, Sinclair Lewis' *Main Street*).

An extremely critical component of the curriculum is the Family Practice Preceptorship. This program was initiated in 1972, and received funding from a US Department of Health, Education, and Welfare (HEW) Special Projects grant during its early years.

The Family Practice Preceptorship program is required of all students in both years of the curriculum. The scheduling and format of the program have been tailored to take maximum advantage of the physicians' time, student academic demands, and clinical facilities available. The current format has been virtually unchanged for the past three years; it has proven to be remarkably successful. The general purposes and goals of the program are:

1. To expose the medical student to metropolitan and small community settings in order to allow them to assess advantages and potential disadvantages of prototypic practice sites;
2. To expose the medical student to the practice of high quality family medicine in metropolitan and non-urban areas to demonstrate the need for qualified family physicians in these areas;
3. To provide "real life" successful family physicians as mentors and role models for medical students;
4. To expose the medical student to the various methods utilized by the family physician to ensure quality continuing medical education outside the medical center;
5. To enable the student to assess the methods by which the family physician establishes a professional life style and roles compatible with excellence as a physician, as a community member, and as a person; and
6. To expose the student to the broad variety of medical, social, and psychological problems which come to the attention of the family physician, and to the correspondent multiplicity of management techniques, resources, and styles available to the preceptor.

Assessment of whether these goals are met is provided by feedback from both student and preceptor. A workshop is conducted each year with preceptors which centers on the attainment of these goals. Students are surveyed annually to assess their perspective of the program. Feedback is overwhelmingly positive; of the 94 students participating in the program during 1978-1979, 100 percent stated that the experiences were valuable, enjoyable, and extremely productive. The great majority had only one criticism; the program is too short and they would prefer more time with family physicians. Preceptors also unanimously praise the program; a better indicator of their acceptance and enthusiasm, however, is the preceptor attrition rate. Over the past five years, only one family physician has elected not to continue in the program; there is currently a "waiting list" of area family physicians who wish to participate.

Family practice preceptors are not paid for their teaching; they are eligible for appointment to the clinical faculty of the School of Medicine. They are selected utilizing the following criteria:

1. Peer recognition of the high quality of their practice;
2. Known teaching ability from prior university contacts;
3. Recognition by other specialists to whom they have referred patients;
4. Type and quality of practice as judged by coordinators of the program; and
5. Suitability for clinical appointment following review by the teaching faculty, the Dean of the School, and the Vice-President for Health Sciences of the University.

All preceptors are actively practicing physicians in general and/or family practice; in the training of the student, they utilize their offices, community hospitals, nursing homes, and all other practice sites. They are located within an extremely large area (30,000 square miles) bounded by International Falls, Minnesota on the north, and Cambridge, Minnesota to the south, and from Cass Lake, Minnesota on the west, to Ashland, Wisconsin on the east.

During the first year Family Practice Preceptorship, students are assigned to family physicians in the Duluth-Superior area; this group includes second and third year residents in family practice. Each student meets with his/her preceptor eight times over the course of the academic year; each

session is of four hours duration (minimum). These sessions are alternated between mornings and afternoons and across various days of the week. The student and preceptor initiate a "teaching contract" (within the framework of the general program goals) which recognizes the various practice sites used by the preceptor and the limited but developing clinical skills of the student; by mutual agreement, the times for the meetings can be rearranged. During scheduled preceptor sessions, no other medical school classes or activities are scheduled.

The second year preceptorship experience occurs three times yearly; each session lasts a minimum of three days. These are scheduled for approximately the middle of the three academic quarters, and again all other medical school classes and activities are suspended for these periods. The second year student is assigned to a family physician in a non-metropolitan area; typically, the student lives with the preceptor and his/her family at no cost to the student. In a few communities, alternative living arrangements have been made available if the home setting is not able to accommodate the student.

During the students' time in the small communities, they function as "first assistant" to the preceptor; in addition to routine office practice, they are exposed to obstetrical and surgical procedures, extended care in long-term facilities, satellite clinic operations in extremely small communities, business office procedures, continuing medical education (CME) activities, and community functions. They are exposed to the variety and fullness of the life of the family physician. Many students comment that the preceptorship is the "high point" of their educational experience in Duluth. Preceptors are overwhelmingly enthusiastic about their participation; many have commented that the program functions as an extremely important part of their personal continuing medical education.

Site visits are made to the preceptorship settings when the students are with the family physician in order to maintain an effective communication link between preceptors and the School of Medicine. On these visits, an informal evaluation of student progress is carried out and any minor problems that may occur with program logistics are discussed and solved at the training site. Although the preceptors are not paid or reimbursed

for any costs, they have been magnificently generous with their time, homes, and families.

### Indicators of Programmatic Success

Over the past four years, the number of students who elect family practice residencies on a national basis has been fairly stable; approximately 11 to 13 percent can be expected to enter the specialty this year.

Of the first four classes who have successfully completed the first two years in Duluth, the majority have selected the family practice "track" upon transfer to Minneapolis. Of greater interest, however, is the selection, via the National Resident Matching Program (NRMP), of residencies. Residency selection is a much more firm indication of specialty preference. Table 3 describes the NRMP results for the first four Duluth classes.

As can be seen, 55 percent of students who began their training in Duluth elected family practice residencies; an additional 16 percent elected the other primary care specialties of internal medicine and pediatrics. This proportion is more than four times greater than the national proportion selecting family practice.

It is too early to tell whether or not the graduates will practice in smaller communities; the charter class of the school has just finished the third postgraduate year, and many are still in training. Follow-up studies will indicate whether or not the institutional goals in this regard will be achieved.

### Discussion

It is apparent that the Duluth School of Medicine has attained one of the two goals set during the developmental stages of the program. Fifty-five percent of the graduates in the first four classes elected family practice residencies; it is interesting to speculate about some of the potential reasons for this success. What conditions are necessary to achieve such an institutional goal?

First, the faculty and administration of an institution must meaningfully espouse institutional objectives. The faculty, from the school's inception, has been overwhelmingly positive toward the goals of the school. Curricular adaptations have been devised and accepted by the faculty in basic and clinical sciences while designing an excellent program in the general medical sciences; the per-

**Table 3. Residency Choices of Students, School of Medicine, University of Minnesota, Duluth**

Specialty	1972		1973		1974		1975		Total	
	N	%	N	%	N	%	N	%	N	%
Family Practice	14	61	8	40	19	56	21	60	62	55
Internal Medicine	4	17	5	25	2	6	3	9	14	13
Pediatrics					3	9			3	3
Surgery	4	17	3	15	4	12	5	14	16	14
Obstetrics/Gynecology			1	5			2	6	3	3
Flexible			1	5	2	6	3	9	6	5
Public Health										
Service/Military	1	4			3	9			4	4
Other			2	10	1	3	1	3	4	4
<b>Total</b>	23	99	20	100	34	101	35	101	112	101*

\*Percentages do not total 100 percent due to rounding

formance of the students on the National Boards (Part I) is evidence of this excellence. The pass rate for this examination nationally is approximately 88 to 89 percent; for the first five classes in Duluth, it has been 96 percent.

The second prerequisite for programmatic success is a responsive clinical community. The University of Minnesota, Duluth, is a community based medical school; of the approximately 230 members of the clinical sciences department, 99 percent are practicing community physicians; 38 percent are family physicians from the area. Magnanimous in their support for the school, they have enabled and been responsible for the development of an excellent clinical training program for the students. They have made many financial contributions to the school; the family physicians have, for example, donated more than \$100,000 to a loan fund for the Duluth students. Without the support of the area physicians—in all specialties—the school could not be successful.

Another component responsible for the Duluth program's success is the Family Practice Preceptorship. It is important to realize that, even though a required element of the curriculum, the preceptorship does not represent a "hard sell" approach. The students, at entry, are open to the concepts and principles of family medicine; they do not have to be "re-sold." Rather, appropriate instruction and role models must be available which are

compatible with the students' a priori preferences. It is felt that this compatibility has been achieved.

Selection of the students is critical. The Admissions Committee, comprised predominantly of faculty of the school, is fully cognizant of the institutional goals. An active effort is made to select students who will fulfill the objectives. While academic credentials are certainly scrutinized with care, preference is shown for those applicants who exhibit a propensity for family practice and/or for non-metropolitan practice sites. Based upon the specialty choices of the first four classes, the committee has done extremely well.

There are, of course, many other factors which have enabled the school to reach its goal. One is the small size of the institution which makes possible a personal approach to each student. The students have available to them an open and friendly faculty; their tenure in Duluth is typically characterized as being "a great deal of enjoyable work." The small size also makes possible the one-to-one teaching relationship in the preceptorship, a ratio appreciated by both student and physician.

To summarize, the attainment of specific goals for an institution is dependent upon the same factors as the attainment of personal goals. Requirements include appropriate planning, dedication, ability, and hard work. These have been combined successfully in Duluth.