Graduate Follow-Up in the University of Minnesota Affiliated Hospitals Residency Training Program in Family Practice and Community Health

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A program in family practice was initiated at the University of Minnesota in 1969. The program later was organized as a division of the Department of Internal Medicine and then became a full-fledged department in 1970. The graduate education training program (the Affiliated Program) was originally accredited in 1969 and activated in 1971. It now comprises six units with 132 residents currently enrolled, making it the largest single program in the country. The department also offers a master of science degree in family practice and community health, and a faculty development program. The department is additionally involved in undergraduate education (currently 35 percent of this year's medical school class of 277 graduates entered a family practice residency) and in continuing medical education.

The Affiliated Program which has evolved under the direction of the University of Minnesota, Department of Family Practice and Community Health, includes six units, each associated with one or more hospitals. Each of the units has its own family practice center organized as either a partnership (University Hospitals) or corporation (five units). These are responsible to the educational program for the fiscal operation of the family practice centers. The units are located in the Twin Cities (Minneapolis/St. Paul) area, within a 20-mile radius of the university campus.

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The Affiliated Program

Organizational Framework

The Affiliated Program is accredited as a single program under the direction of the head of the Department of Family Practice and Community Health. Each of the units is staffed with full-time university faculty, Unit Directors, and Associate Directors who are based at the respective parent hospitals and responsible for the operation of that unit to the Program Director (Figures 1 and 2).

These faculty are supplemented by part-time paid and volunteer teachers. Currently the Department has 56 full-time faculty, 35 part-time salaried at greater than 15 percent time, 96 part-time salaried at less than 15 percent time, with over 500 volunteer (unpaid) faculty. Many of these faculty participate in undergraduate as well as graduate education activities. All of the units have coordinators in each of the major specialties of internal medicine, pediatrics, surgery, obstetrics and gynecology, and psychiatry who may teach but whose major role is to assume responsibility, under the direction of the Unit Director, for the coordination of local resources in their discipline for the training program at that unit.

Although each of the residents identifies primarily with one of the units for his or her three years of training, a portion of the didactic curriculum is provided for all residents at the central university site.

Behavioral science training is supplemented by itinerant teachers from the university going out to teach at the peripheral family practice centers.

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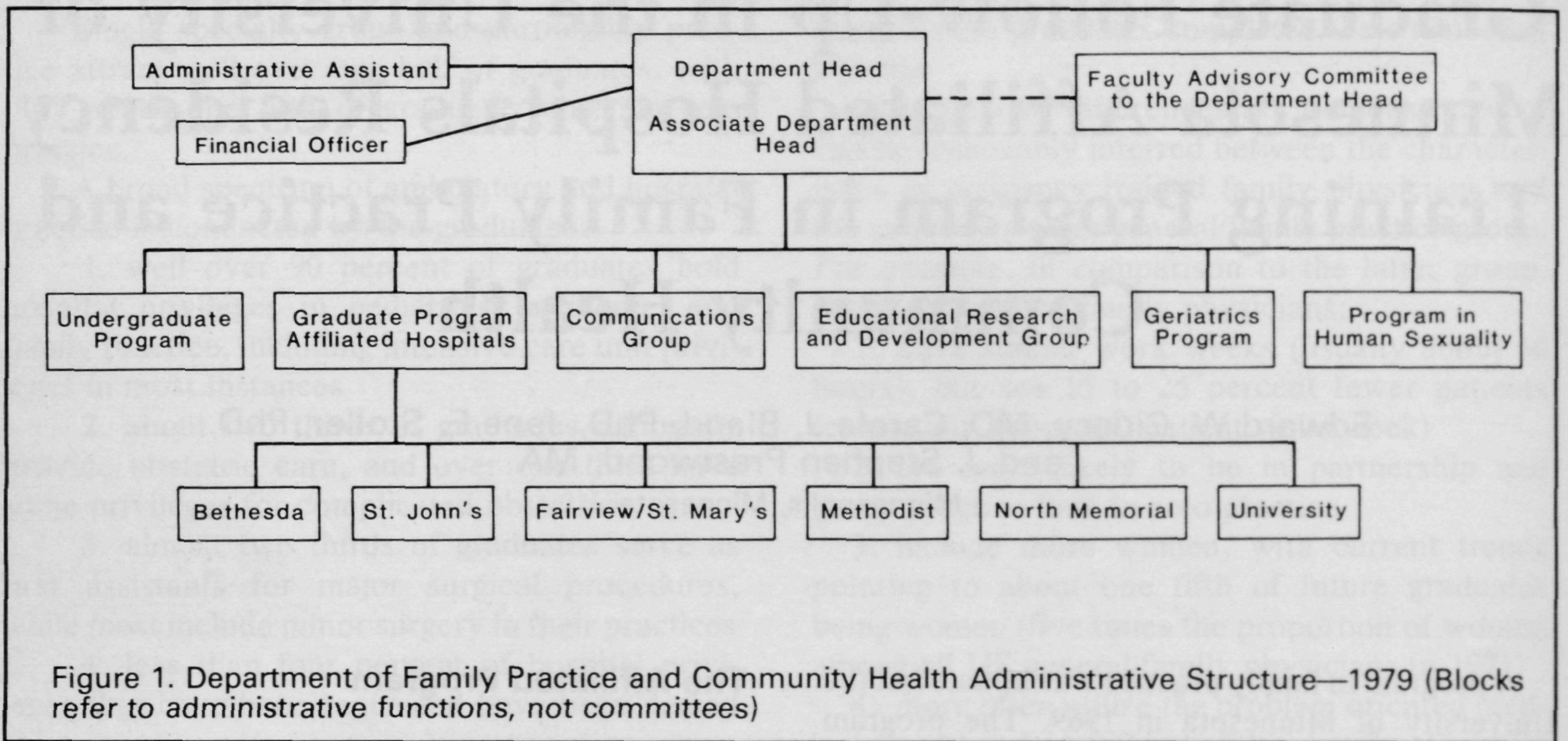

Figure 1. Department of Family Practice and Community Health Administrative Structure—1979 (Blocks refer to administrative functions, not committees)

Table 1 shows the number of residents in training within the Affiliated Program at each of the units during the year 1979-1980.

Program Goals

Although each of the units has unique characteristics relating to its facilities, medical staff, patient populations, faculty, and residents, they all subscribe to the overall goals of the program. These goals are:

1. to produce family physicians who are able and willing to provide comprehensive and continuous medical care within the context of the patient's family and community
2. to produce family physicians who will locate in the geographic areas of need within the area of responsibility of this Affiliated Program.

Major educational policy decisions are made within the constraints of the accreditation requirements, by faculty who serve on the department's Graduate Education Committee. This group is responsible for the development of overall Affiliated Program objectives. These objectives define the minimum competencies expected of all residents as a result of satisfactory completion of the residency. These objectives are currently being related to specific rotations and used as the basis for the development of an in-training competency based assessment system.

Typical Curriculum

Maintenance of continuity of care for the residents' patient population frequently requires half-day scheduling (rather than full-day). This is particularly true in the second and third years of the residency. As a consequence, rotational time is frequently reported by many programs as weeks or months in which large percentages of the time may actually be spent within the family practice center rather than dedicated to the particular discipline to which that time is attributed. Because scheduling in this program is done primarily on a half-day basis, the time commitments listed in months on Table 2 represent an accurate half-day tally of all three years of the training program in which 44 half-days are considered to be one month.

These figures are an actual average of the six units involved in this program. The curriculum includes 9 months exposure to family practice (in the family practice center and in community health), 7.6 months of internal medicine, 4.5 months of

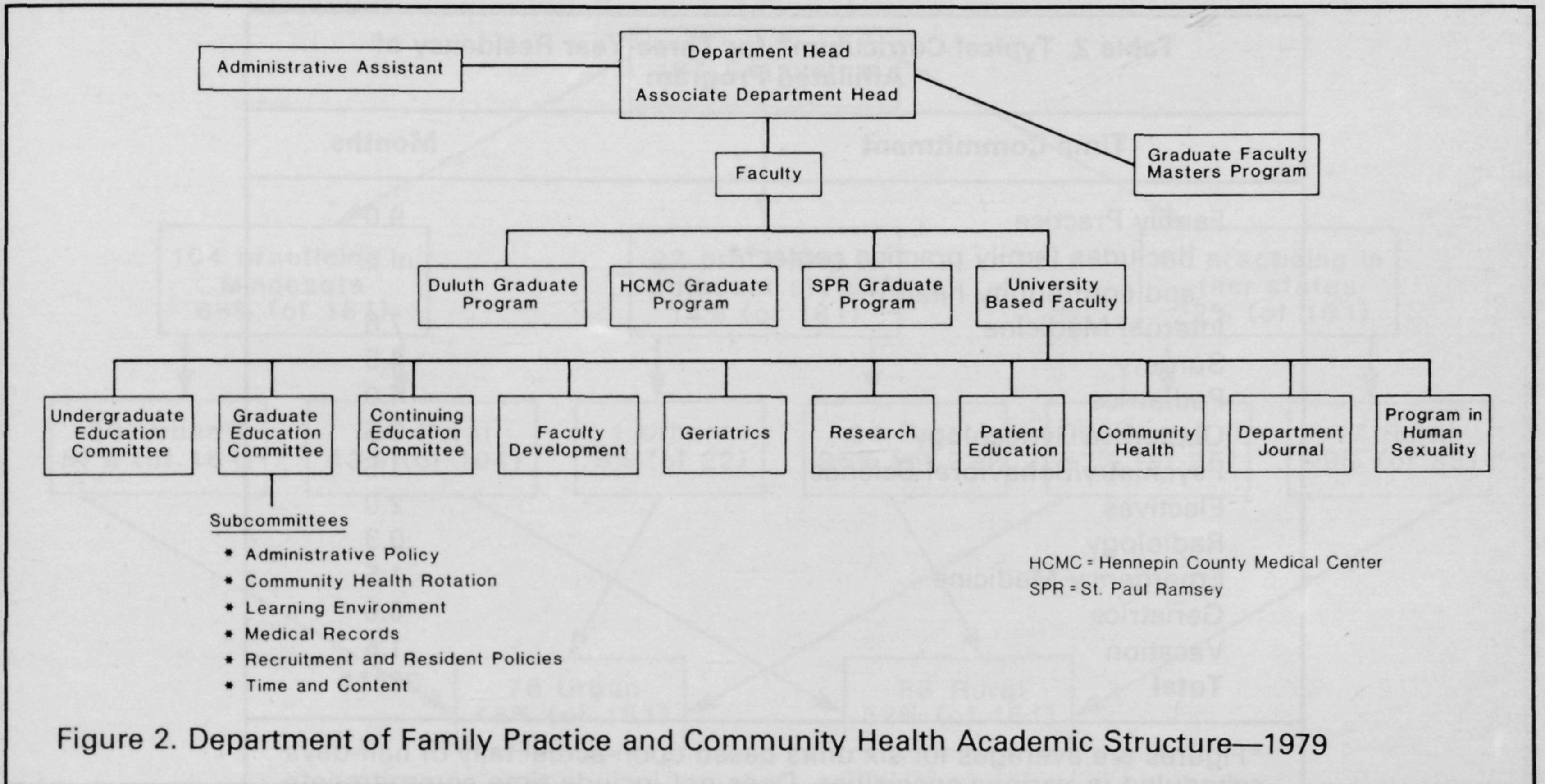

Figure 2. Department of Family Practice and Community Health Academic Structure—1979

Table 1. University of Minnesota Affiliated Hospitals Residency Training Program in Family Practice and Community Health 1979-1980

Program Unit	Number of Residents	Year Unit Became Operational
Bethesda Lutheran Hospital	24	1971
St. John's Hospital	18	1971
Fairview/St. Mary's Hospitals	29	1971
Methodist Hospital	17	1971
North Memorial Hospital	25	1972
University Hospitals	19	1970
Total	132	

surgery, 4.0 months of pediatrics, 3.5 months of obstetrics/ gynecology, 1.5 months of psychiatry/ behavioral science, 2 months of electives, 0.3 months of radiology, 1.5 months of emergency medicine, 0.5 months of geriatrics, and 1.6 months of vacation. Each of the units, with the exception of vacation time, will vary slightly from these averages. These variations accommodate the needs of individual residents and institutions.

All residents are required to take 12 credits in behavioral science, business management, and research. These courses are offered predominantly by university based faculty and are taught on the university campus and/or by itinerant faculty going out to the various units. The courses cover such topics as communications, psychosomatic

Table 2. Typical Curriculum* for Three-Year Residency of Affiliated Program

Time Commitment	Months
Family Practice (includes family practice center** and community health)	9.0
Internal Medicine	7.6
Surgery	4.5
Pediatrics	4.0
Obstetrics/Gynecology	3.5
Psychiatry/Behavioral Science	1.5
Electives	2.0
Radiology	0.3
Emergency Medicine	1.5
Geriatrics	0.5
Vacation	1.6
Total	36***

*Figures are averages for six units based upon actual tally of half-days scheduled in various specialties. Does not include time commitments of "on call" schedules
**Time spent in family practice center approximates: first year—one half-day/week; second and third years—two to four half-days/week
***One month equals 44 half-days

Table 3. Affiliated Program Graduates by Unit 1971-1979

Program Unit	Number of Graduates
Bethesda Lutheran Hospital	44
St. John's Hospital	28
Fairview/St. Mary's Hospitals	52
Methodist Hospital	28
North Memorial Hospital	26
University Hospitals	25
Total	203

medicine, dynamics of marriage and family, quantitative methods, practice management, and community health.

The Affilitated Program uses a series of evaluation systems:

1. periodic internal review
2. monthly criterion referenced evaluation system
3. competency based in-training assessment system (presently being developed)
4. special forms of evaluation (not regularly scheduled), including an interviewing checklist, resident profile, chart audit, and special project evaluation. In addition, two units require residents to keep a professional activities log which is summarized by computer and used in conjunction with the quarterly reviews of other evaluation results.

Resident Selection

Until 1979, the Affiliated Program had one National Resident Matching Program (NRMP) number. Residents were interviewed by Unit Directors and Associate Directors at each of the units. Each of the units rank ordered their selections and a master list for the program as a whole was compiled. In addition, an internal match procedure was accomplished in which the applicants rank ordered each of the individual units. As a result of

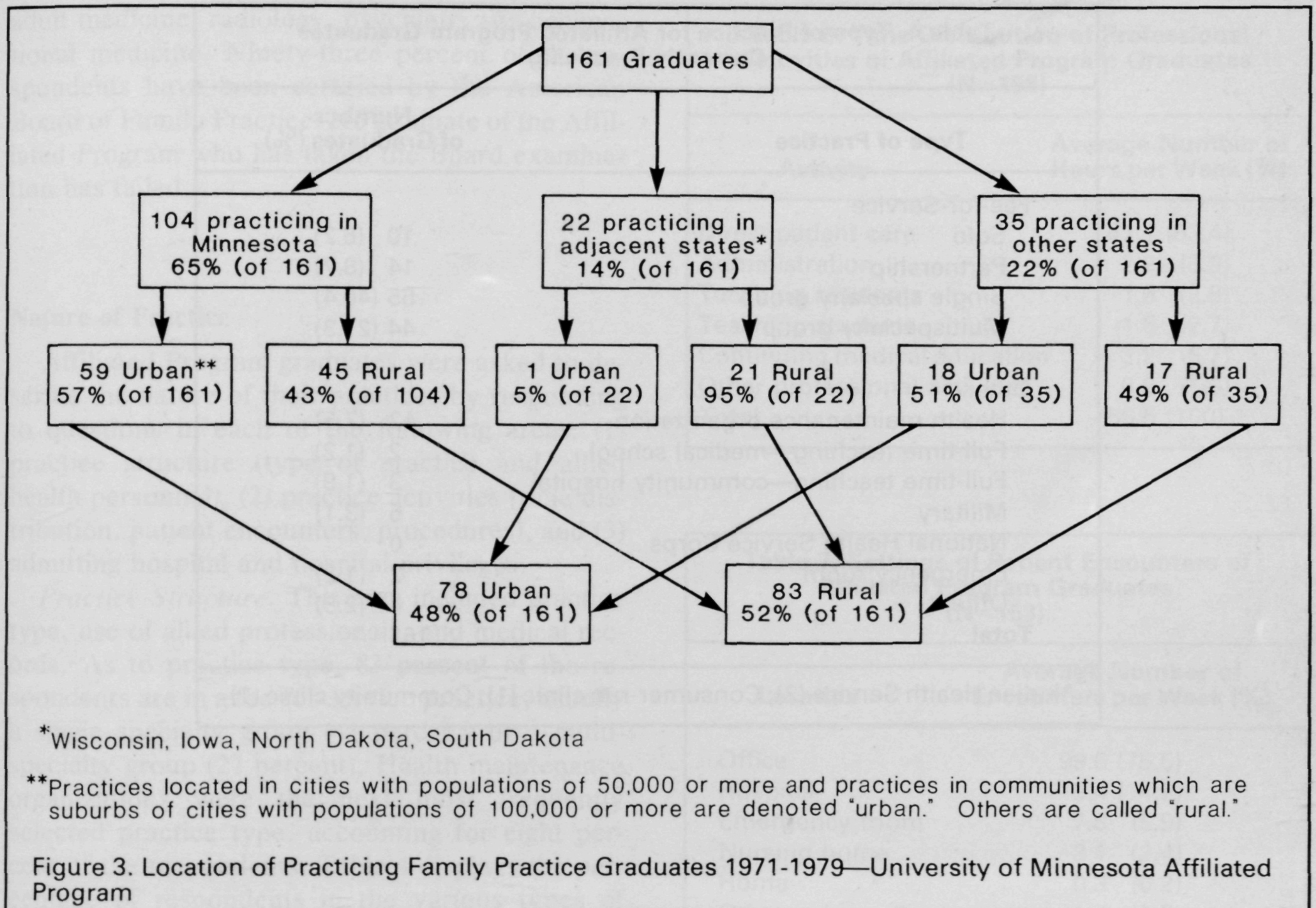

Figure 3. Location of Practicing Family Practice Graduates 1971-1979—University of Minnesota Affiliated Program

this, 65 percent of the residents have, over the years, been able to match with their first-choice unit.

In 1980, individual unit matching numbers have been made available while still preserving the integrity of the single program accreditation. This change has simplified the matching process for the applicants. The review of the applicants within the program remains the same, including input from the Unit Directors as a group.

Affiliated Program Graduates

As of June 30, 1979, there have been 203 graduates of the Affiliated Program. Table 3 displays graduates by residency unit. The Affiliated Program has had a total of 278 former residents. Thus, 75 residents did not graduate. Of these 75 residents, 40 percent went into private practice, 17 percent transferred to residencies in other specialties, 12 percent transferred to other family practice residencies, 13 percent went into military service, 9 percent left for personal reasons, and 8 percent cited other reasons for leaving. Most of these former residents left prior to 1975. During the last four years, an average of two residents have left each year without graduating, which is an attrition rate of less than 5 percent per class.

Graduate Follow-Up Study

Methods

In January 1980, an Alumni Survey was sent to all 203 graduates of the Affiliated Program. The survey included the standard information being requested by the Washington and Virginia pro-

Table 4. Type of Practice for Affiliated Program Graduates Currently Practicing

Type of Practice	Number of Graduates (%)
Fee-for-Service	
Solo	10 (6.2)
Partnership	14 (8.7)
Single specialty group	65 (40.4)
Multispecialty group	44 (27.3)
Other	
Health maintenance organization	12 (7.5)
Full-time teaching—medical school	2 (1.2)
Full-time teaching—community hospital	3 (1.9)
Military	5 (3.1)
National Health Service Corps	0
Emergency room	2 (1.2)
Other*	4 (2.5)
Total	161

*Indian Health Service (2); Consumer-run clinic (1); Community clinic (1)

Table 5. Percent of Affiliated Program Graduates Employing Allied Health Personnel in Their Practice

Personnel Employed	Percent of Graduates (N=149)
Receptionist	86.6
Laboratory Technician	69.8
Registered Nurse	64.4
Licensed Practical Nurse	64.4
Transcriptionist	63.8
Medical Assistant	50.3
Nurse Practitioner	20.1
Physician's Assistant	18.8
Social Worker	6.7
Other	46.3

grams as well as information relevant to the Affiliated Program review and alumni records. The results reported here are from the responses of residency graduates only. Of the 203 graduates surveyed, 161 returned their surveys resulting in a response rate of 79 percent.

Results

Location

Figure 3 displays the location of the 161 graduates of the Affiliated Program who are currently practicing and who responded to the survey. Fifty-two percent have located in rural areas, that is, towns of less than 50,000 and excluding communities which are suburbs of cities with populations of 100,000 or more. Although many of our graduates have located in communities whose populations are less than 50,000 they are considered to be metropolitan if they are suburbs of a community in excess of 100,000 population. This has ocurred frequently in the Minneapolis/St. Paul area. Utilizing this definition, forty-eight percent of the graduates are located in metropolitan communities.

Field of Practice

Virtually all of the respondents consider their primary specialty to be family practice (96 percent). The remaining listed emergency medicine,

adult medicine, radiology, psychiatry, or occupational medicine. Ninety-three percent of the respondents have been certified by the American Board of Family Practice. No graduate of the Affiliated Program who has taken the Board examination has failed.

Nature of Practice

Affiliated Program graduates were asked to describe the nature of their practices by responding to questions in each of the following areas: (1) practice structure (type of practice and allied health personnel), (2) practice activities (time distribution, patient encounters, procedures), and (3) admitting hospital and hospital privileges.

Practice Structure. This area included practice type, use of allied professionals, and medical records. As to practice type, 83 percent of the respondents are in a fee-for-service practice, usually a single specialty group (41 percent) or a multispecialty group (27 percent). Health maintenance organizations were the next most frequently selected practice type, accounting for eight percent of the respondents. Table 4 displays the percentage of respondents in the various types of practice.

The relative distribution of allied health personnel who are typically employed in the respondents' practices is shown in Table 5. Most frequently employed were receptionists (87 percent), laboratory technicians (70 percent), registered nurses (64 percent), licensed practical nurses (64 percent), transcriptionists (64 percent), and medical assistants (50 percent).

With regard to medical records, 81 percent of the respondents reported using problem oriented medical records while only 29 percent use family folders.

Practice Activities. This area included hours worked, patients encountered, office laboratory procedures performed, office surgical procedures performed, and obstetrical care rendered.

On the average, respondents devote approximately 56 hours a week to professional activities. Not surprisingly, most of the time is spent providing direct patient care (83 percent), with the next highest time commitment to continuing medical education (6 percent) (Table 6).

Table 7 shows the average number of patient encounters each week (132). Most of these occur in the office (100), hospital (19), or emergency room (8). On the average, 5 encounters per week occur in nursing homes, patients' homes, or other sites.

Table 8 displays the percentage of respondents who perform selected laboratory or surgical procedures in their offices. It is not unexpected to find that the most common laboratory procedures reported are urinalysis (94 percent), pregnancy test (92 percent), resting electrocardiogram (90 percent), streptococcal screening (87 percent), complete blood count (86 percent), and urine cultures (82 percent). It would appear that there are a number of graduates utilizing personnel other than laboratory technicians to perform some of this laboratory work inasmuch as only 70 percent of the grad-

Table 6. Time Distribution of Professional Activities of Affiliated Program Graduates (N=158)

Activity	Average Number of Hours per Week (%)
Direct patient care	47.1 (83.4)
Administration	2.2 (3.9)
Teaching residents	1.6 (2.8)
Teaching students	1.5 (2.7)
Continuing medical education	3.2 (5.7)
Other professional activities	0.9 (1.6)
Total	56.5 (100)

Table 7. Settings of Patient Encounters of Affiliated Program Graduates (N=153)

Location	Average Number of Encounters per Week (%)
Office	99.6 (75.5)
Hospital	19.4 (14.7)
Emergency room	7.8 (5.9)
Nursing home	3.1 (2.4)
Home	0.3 (0.2)
Other	1.7 (1.3)
Total	131.9 (100)

Table 8. Percent of Graduates' Practices in Which Selected Office Procedures are Performed (N=157)

	Percent of Practices
Laboratory Procedures	
Urinalysis	93.6
Pregnancy test	91.7
Electrocardiogram (resting)	90.4
Streptococcal screening	86.6
Complete blood count	86.0
Urine culture	81.5
X-ray films	77.7
Audiometric screening	72.6
Chemistries	55.4
Pulmonary function test	43.9
Electrocardiogram (exercise testing)	21.0
Surgical Procedures	
Local excision of skin lesions	96.2
Closed reduction	72.6
Vasectomy	68.8
Breast biopsy	26.1

uates reported employing laboratory technicians.

Included in the office laboratory procedures not performed by the majority of respondents are the electrocardiogram exercise test and pulmonary function test. The only office surgical procedure about which information was requested that was not performed by a majority of the respondents is breast biopsy.

Eighty percent of the respondents are rendering prenatal care to an average of 34 patients per year. Seventy-four percent of the respondents are performing vaginal deliveries with an average of 30 deliveries per year. Only ten percent of the graduates are performing cesarean sections as the primary surgeon with an average of one per year, whereas 62 percent of the graduates are assisting in cesarean sections with an average of four per year.

Hospital Admitting Privileges. The size—according to the number of beds—of the primary admitting hospital used by respondents varied widely; one half of the graduates are utilizing hospitals of 150 beds or less (23 percent, less than 50 beds; 27 percent, 51-150 beds; 21 percent, 151-300 beds; and 20 percent over 300 beds).

All graduates who applied for hospital admission privileges in family practice (99 percent), pediatrics (99 percent), medicine (98 percent), and obstetrics and gynecology (94 percent) were granted privileges (Table 9). Eighty percent of the family practice graduates have admission privileges in surgery. The majority of those who did not obtain privileges in this area did not apply.

Graduates were asked what type of practice privileges they have (Table 10). Ninety-two percent indicated they have routine obstetrical care privileges and 90 percent have surgery, first assist, privileges. In areas where graduates do not have privileges, they were asked to indicate reasons for not having privileges. Most respondents said they had no interest in these areas. With regard to cesarean sections and major surgery, however, lack of training was a frequently cited reason.

Ninety-seven percent reported that they were

Table 9. Admission Privileges of Affiliated Program Graduates

Type of Privilege	Percent of Graduates: Privileges Granted	Privileges Not Applied For	Privileges Denied	No Hospital in Locality
Family Practice	98.7	1.3*	0	0
Pediatrics	98.7	1.3	0	0
Medicine	98.1	1.9	0	0
Special Unit (ICU, CCU, etc)	94.8	3.2	1.3	0.6
Obstetrics-Gynecology	93.5	6.5	0	0
Psychiatry	82.6	12.8	0	4.7
Surgery	79.6	19.7	0.7	0

*The primary specialties of these two residents are emergency medicine and radiology

Table 10. Hospital Practice Privileges of Affiliated Program Graduates

Type of Practice	Percent of Graduates: Having Privileges	Not Having Privileges: No Interest	Lack of Training	Privileges Denied	Liability Costs Prohibitive
Routine obstetric care	92.5	6.3	0	0	1.3
Surgery first assist	90.4	8.9	0	0	0.6
Psychiatric care	76.3	19.7	3.9	0	0
Minor surgery (hernia repair, D & C, etc)	70.9	22.2	5.7	0.6	0.6
Complicated obstetric care	67.7	20.3	9.5	1.3	1.3
Cesarean sections	16.8	39.4	37.4	1.3	5.2
Major surgery (appendectomy, cholecystectomy, etc)	13.0	51.3	32.5	0.6	2.6

satisfied with the privileges they have. Most respondents stated that no documentation beyond certification of residency completion was needed to acquire privileges. A few were asked for other evidence, such as letters of recommendation.

Factors in Location and Stability

Respondents rated the importance of 31 factors in their choice of practice location. Table 11 summarizes their responses by listing the ten most important and the ten least important factors affecting graduates' practice location and stability. The two most important factors cited were the opportunity for group practice and the acceptance of family practice within the community.

Preparation for Practice

Finally, Affiliated Program graduates were asked to assess the extent to which they felt prepared for

Table 11. Factors Affecting Location and Stability of Practice for Affiliated Program Graduates

Ten Most Important Factors*	Ten Least Important Factors**
Opportunity to participate in group practice	Commitment to serve in a designated area as a condition of educational support
Acceptance of family practice in the community	Loan availability in the community
Recreational facilities and opportunities	Non-MD professional consultants
Location preference of spouse	Similar to community in which you were raised
Children's lifestyle/Effect of community on raising children	Expected higher income
Availability of hospital admitting privileges	Favorable state practice regulations/legislation
Size of city	Part-time teaching opportunity
Nearness to hospital	Spouse's educational opportunities
Acceptance of family practice by other physicians in the community	Employment opportunities for your spouse
Need for more people in family practice	Quality of housing in the community

*Listed in rank order where first on the list is *most* important
**Listed in rank order where first on the list is *least* important

practice with regard to 63 items. Table 12 shows their responses in terms of underprepared, adequately prepared, and overprepared. In general, graduates felt adequately prepared for most areas.

It is also of interest to note that in the procedural area the following percentages of respondents felt underprepared: forceps delivery (39 percent), cesarean sections (46 percent), gynecological surgical management (31 percent), office surgery (19 percent), general surgery (19 percent), emergency surgery (32 percent), ophthalmology (29 percent), urology (19 percent), trauma (17 percent), fracture care (38 percent), tonsillectomy and adenoidectomy (58 percent), and tubal ligation (41 percent).

In the behavioral area, despite the fact that 11 percent felt that they were overprepared in psychosocial components of major illness, 16 percent felt underprepared in psychiatric disorders, and 16 percent in counseling skills.

In the area of practice management respondents felt underprepared in the following areas: hospital privileges (20 percent), organization of practice (30 percent), personnel issues (32 percent), finance management and business records (47 percent), office management (38 percent), and estate planning (70 percent).

Thirty-nine percent of the respondents felt underprepared in assessing community health needs, 26 percent in using community health resources, 34 percent in exercising community leadership, and 29 percent in understanding hospital organization and function.

Finally, some graduates felt they were underprepared in the following areas: allergy (29 percent), dermatology (22 percent), hematology (21 percent), nephrology (39 percent), radiology (16 percent), rehabilitation (57 percent), rheumatology (23 percent), developmental disorders (37 percent), and learning problems of childhood (51 percent).

Table 12. Evaluation of Residency Training as Preparation for Practice by Affiliated Program Graduates (N=161)

Subject Area	Percent of Graduates Who Feel: Underprepared	Adequately Prepared	Overprepared
Care of common clinical problems (eg, fatigue, headache, ill-defined complaints)	5.6	91.3	3.1
Providing health maintenance	8.7	88.8	2.5
Use of common drugs	1.2	97.5	1.2
Family structure and function	8.8	82.5	8.8
Psychosomatic problems	7.5	85.7	6.8
Psychosocial components of major medical illness	6.2	82.6	11.2
Proficiency in physician-patient relations	6.8	90.7	2.5
Personal and professional growth	19.9	78.3	1.9
Referral and consultation process	5.0	93.8	1.2
Arranging for continuing education	19.3	79.5	1.2
Allergy	29.2	70.2	0.6
Cardiology	14.3	82.6	3.1
Dermatology	21.9	78.1	0.0
Gastroenterology	3.7	95.6	0.6
Hematology	20.6	78.1	1.2
Infectious disease	7.5	92.5	0.0
Nephrology	39.4	59.4	1.2
Neurology	14.3	85.7	0.0
Pulmonary	8.3	91.0	0.6
Radiology	15.6	83.1	1.2
Rehabilitation	56.9	43.1	0.0
Rheumatology	22.9	76.4	0.6
Newborn care	1.9	93.2	5.0
Well-baby care and child development	9.3	87.6	3.1
Developmental disorders	36.5	62.3	1.3
Learning problems of childhood	50.6	48.7	0.6
Acute childhood illnesses	0.0	98.8	1.2
Chronic childhood illnesses	20.1	78.6	1.3
Uncomplicated delivery	0.6	96.9	2.5
Forceps delivery	38.7	60.0	1.2
Cesarean section	45.5	53.2	1.3
Gynecologic medical management	7.5	91.9	0.6
Gynecologic surgical management	31.2	66.9	1.9
Office surgery and procedures	19.4	80.0	0.6
General surgery	19.4	76.8	3.9
Emergency surgery	32.1	67.3	0.6
Ophthalmology	28.9	71.1	0.0
Otolaryngology	10.8	89.2	0.0
Urology	19.0	81.0	0.0
Trauma	17.1	81.6	1.3
Fracture care	37.5	62.5	0.0
Tonsillectomy and adenoidectomy	57.9	41.4	0.7
Tubal ligation	41.2	58.1	0.7
Stages of human development	20.9	75.3	3.8
Behavior disorders	14.6	79.6	5.7
Psychiatric disorders	16.5	80.4	3.2

Table 12. continued

Subject Area	Percent of Graduates Who Feel: Under-prepared	Adequately Prepared	Over-prepared
Counseling skills	16.2	76.9	6.9
Assessing community health resources	38.9	59.2	1.9
Using community health resources	25.8	71.7	2.5
Exercising community leadership	34.0	64.7	1.3
Understanding hospital organization and function	29.3	69.4	1.3
Obtaining hospital privileges	19.6	79.1	1.3
Medical and local priorities	19.5	79.9	0.6
Relationship with other physicians	5.7	93.7	0.6
Legal aspects of family practice	39.6	60.4	0.0
Organization of practice	29.8	69.6	0.6
Personnel issues	32.1	67.3	0.6
Financial management and business records	47.2	52.2	0.6
Office management	37.7	61.6	0.6
Clinical records	11.8	87.6	0.6
Estate planning	69.5	30.5	0.0

Conclusions

The 11-year experience of the family practice activities at the University of Minnesota has been successful in producing many medical school graduates who have an interest in pursuing a career in family practice (35 percent of the current class). In addition, the graduate education program goals of producing family physicians able and willing to provide comprehensive and continuing medical care within the context of the patient's family and community and who will locate in geographic areas of need within our area of responsibility have been accomplished with an unusual degree of success.

This study documents the need for continuous review of the curriculum and directs attention particularly to certain areas in which the graduates have found themselves underprepared. There seems to be considerably less evidence of areas in which the residents find themselves overprepared.

Care should be taken in the interpretation of data based upon a limited number of years in practice, but it would seem that the typical resident graduate is a male practicing in an urban Minnesota community, in a single specialty group practice, typically with a staff in his office composed of registered and licensed practical nurses, transcriptionists, laboratory technicians, and receptionists. He is spending approximately 56 hours a week in professional activities of which 83 percent is in direct patient care. He has an average of 132 patient encounters per week, of which 76 percent are in the office and 15 percent are in the hospital. The most commonly performed laboratory procedures are complete blood count, urinalysis, pregnancy test, urine culture, electrocardiogram (resting), streptococcal screening, and x-ray procedures. He is active in all major fields of family practice, including internal medicine, pediatrics, obstetrics-gynecology, surgery, psychiatry, and the care of patients in special units. The most important factors affecting location of his practice have been the opportunity to participate in group practice and acceptance of family practice in the community.