

Graduate Education in Family Practice

Thomas L. Leaman, MD, John P. Geyman, MD, and Thomas C. Brown, PhD

Introduction

As noted previously, there are organized family practice programs in over three quarters of the medical schools in the United States and in all of the medical schools in Canada at the present time. Each of these programs has developed, or is in the process of developing, residency training programs in family practice.

The development of a family prac-

tice residency program in a university setting involves a particular set of problems and opportunities not encountered in community hospital settings. A number of basic issues must be addressed, such as the clinical role of the department in the medical school, its relationship to other clinical departments and to residency programs in other specialties, the mechanisms for inpatient care and for teaching by family practice faculty and residents, and the relationship to affiliated community hospitals.

Three well-established and respected departments, which reflect different approaches to the above-mentioned kinds of issues, have been selected for the present study. They are: (1) the University of Minnesota, (2) the Medical University of South Carolina, and (3) the Medical College

of Virginia. During the authors' site visits to each institution, discussions were held with departmental faculty and residents, chairmen of other departments, the Dean of the medical school, and others involved with the family practice residency program. All involved facilities were visited, methods of teaching, patient care, and administration were discussed, and related written materials were reviewed.

This report will present sequentially the three programs, beginning with an overview of the resources and programs of each department, followed by a description of the highlights of each department's residency training programs, and educational and administrative approaches. Subsequent discussion will focus on the commonalities and differences among the three programs.

Dr. Thomas L. Leaman is Professor and Chairman, Department of Family and Community Medicine, Pennsylvania State University, Hershey. Dr. John P. Geyman is Professor and Chairman, Department of Family Medicine, University of Washington, Seattle. Dr. Thomas C. Brown is Assistant Professor of Education in Residence, Department of Family Practice, University of California, Davis.

University of Minnesota

Introduction and Overview

A precipitous decline in the number of family physicians serving the state, particularly in rural areas, became apparent in the early 1960s. In response to this, the University of Minnesota began feasibility studies for a program in family practice in 1966. A program was instituted as a division of the Department of Internal Medicine in 1969. A mandate from the state legislature that year, accompanied by substantial funding, resulted in the establishment of the Department of Family Practice and Community Health in 1972. The Department has grown rapidly since then to become the largest family medicine department (in numbers of faculty and residents) in the United States today.

The faculty of the Department has been recruited from a variety of disciplines. Of the 30 full-time faculty, 21 are physicians (17 family physicians, 1 internist, 2 pediatricians, 1 psychiatrist); 2 are educational psychologists; 1 is a clinical psychologist; 1 a specialist in business administration; 1 a family counselor; 2 are communication specialists; 1 is a psychologist; and 1 a research fellow. Also, there are 103 part-time faculty members from all the major disciplines of medicine. The volunteer clinical faculty consists of 442 physicians in the state who participate in the program as preceptors. These faculty serve 215 residents and a medical school with a class of approximately 250 which, during 1976-1977, had 140 of the third and fourth year students tracking in family practice.

Undergraduate Level — The Department conducts teaching programs for medical students at three levels. At the first-year level, it is responsible for a

large part of the instruction in the "Introduction to Clinical Medicine" course. This course is directed toward history-taking, interview techniques, physical examination, and diagnosis. Second year students take a required preceptorship in a family physician's office in the Twin Cities area for a series of 16 half-day sessions. The Department also contributes to the "Patient Assessment and Advanced Interviewing" course conducted during the students' "Introduction to General Psychiatry." Third and fourth year students may participate in the "Rural Physician Associate Program" which provides a one-year elective experience in rural family practice. Students tracking in family medicine take a six-week preceptorship with a family physician, as well as elective courses or rotations on such subjects as Management Concepts, Family Dynamics, Clinical Laboratory, Surgery for Family Practice, Alcohol and Drug Abuse, Medical Ethics, and Independent Study. Further, the Department provides advisors for all of the students who are tracking in family practice.

Graduate Level — A three-year family practice residency teaching program is conducted in a variety of settings. Six model family practice clinics have been established in conjunction with the University Hospital and six community hospitals in the Twin Cities area, to form the University of Minnesota Affiliated Hospitals Residency Training Program in Family Practice and Community Health (the Affiliated Program). In addition to the Affiliated Program, the two county hospitals in the Twin Cities area (Henepin County General Hospital and St. Paul Ramsey Hospital) also offer

three-year graduate training programs in family medicine. The county hospital programs are academically related to the Department of Family Practice and Community Health, and their faculty members are part of the Departmental faculty, although the programs are administered separately. A new training program in family medicine at the University of Minnesota-Duluth Medical School holds a similar relationship. As of July 1, 1976, there were 215 family practice residents in the entire residency system, which consisted of 131 in the Affiliated Program, 61 in the two county programs, and 23 in Duluth.

Postgraduate Level — An annual one-week "Family Practice Refresher" course is offered, which attracts over 200 physicians each year. A variety of shorter courses is also offered. The Department conducts a unique Master of Science Program in Family Practice and Community Health. This academic degree program is available for residents wishing future training in areas of teaching, research, administration, or political science. As of July 1, 1976, there were 22 students enrolled in the Program, all of whom were family practice residents.

Description of the Affiliated Program

The Department of Family Practice and Community Health decided early to develop a cohesive, centrally located program involving the University Hospital and six community hospitals within a 25-mile radius in the Twin Cities area. This decision was based on an interest in maximizing university support and responsibility. Table 1 presents an overview of the component units of the Affiliated Pro-

Table 1. The University of Minnesota Affiliated Hospitals Residency Training Program in Family Practice and Community Health*

Family Practice Center	Hospital	Number of Residents	Year Started
Bethesda Family Physicians	Bethesda Hospital	24	1971
Hazel Park Family Practice Center	St. John's Hospital	18	1972
Smiley's Point Clinic	Fairview/St. Mary's Hospital	30	1971
St. Louis Park Medical Center	Methodist Hospital	18	1971
North Memorial Family Practice Clinic	North Memorial Hospital	23	1972
University Family Practice Clinic	University Hospital and Affiliated Hospitals	18	1971

*All of the units in the Affiliated Program are located in Minneapolis or St. Paul within a 30-minute radius of the University.

gram.

The close professional relationship between the Departmental faculty and the affiliated community units permits the graduate training program to emphasize community experience and service as well as academic learning. The six family practice clinics provide the future family physician with a representative model of group practice in an urban setting and an insight into a team-oriented approach to primary care. Residents are associated with one of the six units for the full three years of their specialty training. Each clinic provides a unique experience of ambulatory care, depending on the ethnicity, age, and income levels of its surrounding community. In addition to ambulatory care experience, each unit is designed to present a complete, well-balanced, core curriculum for the development of the basic primary care requisites: obstetrics/gynecology, internal medicine, surgery, pediatrics, emergency and behavioral medicine.

Some of the community hospitals in the Affiliated Program previously conducted rotating internships prior to developing family practice residency training. None of these hospitals presently offers other specialty residency training, although obstetrics/gynecology and surgical residents from the University rotate through some of

the hospitals. The following further describes each of the six residency units.

Bethesda Lutheran Hospital — This private, 300-bed, general hospital is located near the state capitol in St. Paul. The Bethesda Family Physicians Clinic is located in a large suite of offices in a modern professional building nearby, with internal access to the hospital. The clinic includes 12 examination rooms, a minor surgery and orthopedics room, a conference room, video-tape facilities, and an x-ray unit, and its support areas. The hospital has both coronary and intensive care units, a fully staffed Emergency Room, and a new, 15-bed crisis intervention center.

St. John's Hospital — This 400-bed, community-based hospital is located on the east side of St. Paul. The hospital has a full range of facilities available, including a large, chemical-dependent treatment center. Over half the members of the active medical staff are family physicians, who provide 85 percent of the hospital admissions. The associated Hazel Park Family Practice Center is located 2½ miles away and draws its patient population from the surrounding middle-class neighborhood. The clinic building was once a neighborhood grocery store but has been totally remodeled to provide

modern, efficient facilities. This unit is the only one in the Program in which the Unit Director's practice was converted to a teaching practice. It is interesting to note that 75 percent of this physician's practice remains with the teaching program.

Fairview and St. Mary's Hospitals — These two private hospitals, with a combined capacity of 908 beds, are located across the Mississippi River from the University of Minnesota. They are well equipped and well staffed, with 523 physicians, including both family physicians and a full range of other specialists. Fairview Hospital is particularly active in social service, adolescent crisis, geriatric inpatient, and orthopedic follow-up. St. Mary's Hospital is particularly active in cardiac rehabilitation, chemical dependency, and a mental health and drug treatment community outreach program. The Family Practice Center is located across the street from its affiliated hospitals in a Victorian building — a community landmark — and is known as Smiley's Point Clinic. The Center offers a program in gerontology, which provides health care to senior citizens in the neighborhood, and also services a school health service for students of a nearby liberal arts college.

Methodist Hospital — This private, 470-bed hospital is located in a western suburb of Minneapolis. This hospital contains complete facilities and, since 1975, has been designated as a regional cancer center. Its Family Practice Center has been located at the St. Louis Park Medical Center, one mile away. This is a large, multiple-specialty clinic with 90 physicians. Patient population is drawn from the surrounding suburban area and is largely young and middle class. Increasing administrative and conceptual difficulties between the family practice group and the large multidisciplinary group have resulted in a reassessment of this location. Thus, as of July 1977, this unit will relocate to the neighboring community but will continue its relationship with Methodist Hospital.

North Memorial Hospital — This private, nonprofit hospital, with 550 beds, is located in northern Minneapolis. The hospital has several unique features which add to its strength as a family practice training center. These include an unusually busy Emergency Room, an obstetric service that aver-

ages nearly 200 deliveries a month, a special care nursery for premature or severely ill newborns, and a 35-bed acute psychiatric and crisis intervention center. North Memorial's Family Practice Center is located about two miles from the hospital. Recently it has been remodeled to provide up-to-date facilities, including x-ray and laboratory capabilities.

The University of Minnesota Hospital — This hospital provides complete secondary and tertiary health-care facilities. Some of the usual family practice resident rotations, such as general internal medicine, are not available in this setting, and residents have access to a number of other hospitals in the Twin Cities area. The University Family Practice Center is located on the campus. The current space available is quite compact, but a greatly enlarged family practice area is under construction. The majority of patients seen at the Center are neighborhood residents who live within a one-mile radius of the University. Additional patients include faculty and students from the University.

Common Educational Approaches

While each unit of the Affiliated Program is uniquely designed to best fit its particular cadre of residents, Unit Director, and affiliated hospital and community setting, the administrative structure and many educational aspects are common to all units. The common educational goals of the Affiliated Program are: (1) to produce family physicians who are able and willing to provide medical care of a comprehensive and continuous nature within the context of the patient's family and community, and (2) to produce family physicians who will locate to the geographical areas of need within the area of responsibility of this Program.

Curricular objectives and program standards are being derived from these goals and, presently, a detailed set of core curricular objectives, which define the minimum competencies expected of all residents, is being completed and piloted in two of the affiliated units. Also, the Affiliated Program is presently involved in the development and implementation of a common set of standards and policies applicable to all units of the Program.

The "typical" curriculum in the Affiliated Program includes eight months of internal medicine, four months of pediatrics, four months of obstetrics/gynecology, three and a half months of surgery, one month of emergency medicine, two months of orthopedics, one month of otolaryngology, two months of neurology, two months of psychiatry, one month of community health, and six months of electives. Each unit, however, has instituted a number of variations to meet particular needs and opportunities. These differences allow the program to fit into a wide range of community settings and meet a variety of resident and faculty needs.

All the units of the Affiliated Program use the University's resources extensively. All residents are required to take the same courses in behavioral science, business management, and research which are offered predominantly by university-based faculty and are taught at the University campus. Required courses cover such topics as Communications, Psychosomatic Medicine, Dynamics of Marriage and Family, Quantitative Methods, Practice Management, and Community Health.

As part of the required behavioral science teaching program, all residents throughout the Affiliated Program are recorded on video tape with a patient on two occasions during the first year. The taped interaction is then reviewed and critiqued by a group which includes the respective resident, faculty members, practicing family physicians, and a behavioral scientist. Immediate feedback and written evaluations are subsequently provided to the residents.

Family Practice Grand Rounds are held at the University on a weekly basis for all residents, and facilitate a multidisciplinary approach to common clinical problems encountered in family practice.

The Affiliated Program uses a series of evaluational systems. Each part of this series is designed for data collection to assist in making decisions based on all available information. The decision-maker may be a resident concerned about his or her own strengths and weaknesses, or a Unit Director asking about a Unit's program, or a course instructor concerned about teaching effectiveness, or the Program Director concerned about where best to place funds to meet overall needs of

the Affiliated Program. To collect information to help answer such questions and make subsequent decisions, the Affiliated Program uses a series of evaluational systems including: (1) a periodic internal review, (2) a criterion-referenced system, (3) a norm-referenced system, and (4) special forms of evaluation (not regularly scheduled), including an interviewing checklist, resident profile, chart audit, and special project evaluation.

The periodic internal review seeks information from a wide variety of sources about the conduct of the entire program, including administration, residents, faculty, and patients. The results of these reviews are examined and used as a basis for making appropriate changes in the Program. The criterion-referenced system, currently in the developmental stage, compares residents' and teachers' abilities to well-defined, expected competencies. The norm-referenced system compares residents, teachers, and services to other residents at the same level, to other teachers, and to other services. Chart audit is used as an evaluational strategy as well as an educational tool, providing residents with immediate feedback on their record-keeping skills and decision-making abilities. Much emphasis is placed on chart audit throughout the Affiliated Program, and regular audit conferences are held. One unit requires precepting family physicians to audit every chart in the Family Practice Center on a daily basis.

Emphasis has been placed on data retrieval in all of the Family Practice Centers. In four centers, the data retrieval is automated and tied to the billing system, which is able to provide regular reports, the age/sex profile, the clinical problem register, the longitudinal patient care report, and a category analysis of problems encountered. Data are provided both for the practice as a whole and for each individual provider. The system has practical applications in management, program evaluation, resident education, and clinical research.

Administrative Aspects

The Chairman of the Department of Family Practice and Community Health is the Program Director of the Affiliated Program. He is responsible

for the conduct of the Program, accountable to the accrediting agency and to sources of programmatic funding, and holds the final authority for making decisions relative to the conduct of the Program. With a program of this size and complexity, no single individual can personally plan, implement, and evaluate all the many aspects of this multifaceted program. Thus, while the entire faculty is responsible for the educational aspects, the Department's Graduate Education Committee, which consists of the Program Director, Unit Directors, and other faculty, proposes policies and programmatic guidelines for the Affiliated Program. Also, the Department has identified faculty members with specific administrative roles; these individuals relate with the Program Director in implementing approved policies and guidelines.

Application and selection procedures for new residents are centrally coordinated. A single NIRMP matching number is used throughout the system, and applicants are then internally matched to their desired unit through negotiations of the Program Director and Unit Directors. To date, interview visits are scheduled for all resident applicants so that each may be interviewed in any of the six units of the Program in which they have an interest. Preference is accorded to residents from Minnesota or with Minnesota ties.

Financial support for the Affiliated Program comes from state appropriations, the affiliated hospitals, federal funds, and clinic-generated monies from patient care. The Program Director determines the allocations of these funds with input from the Budget Committee composed of Unit Directors, hospital representatives, medical school representatives, and others. A nonprofit professional corporation has been established at each unit to provide a mechanism for handling patient-generated income.

The annual budget for all programs related to the Department of Family Practice is about \$7 million. In the first few years the state funding was provided for both the Department and the Graduate Program on a special appropriation's basis, but as of 1976-1977, the Department funds have been incorporated into the annual budget for the School of Medicine. The annual budget for the Affili-

ated Program is in excess of \$4 million per year.

The following analysis represents the approximate contributions to total costs of the Affiliated Program during the years 1973-1976: one third from state funds, one third from patient care income, one sixth from hospital contributions, and one sixth from federal grants.

It is estimated that the total cost per resident is approximately \$33,000 per year. With this in mind, state funding was provided on the basis of \$15,000 per resident per year during 1975-1976, when there were 100 residents enrolled in the Program. However, this level of funding was held constant during the 1976-1977 year, when there were 131 residents enrolled, so that capitation per resident was substantially reduced. Further, since the termination of a 2¼-year Department of Health, Education, and Welfare grant as of July 1976, no federal funds have been available to support the Program. Efforts to provide adequate funding in light of these decreases include an increase in each affiliated hospital's contribution to a level of \$6,000 per year for each resident in its unit. Also, it is anticipated that greater efficiencies in patient care and closer scrutiny of indirect costs now being allocated to each Family Practice Clinic can increase the proportion of funding from patient care revenue to approximately 40 percent of total Program cost. While these efforts have maintained the Program for the past year, federal funding is necessary and has been applied for.

Comment

The Department of Family Practice and Community Health is now recognized and respected as a major clinical department in the School of Medicine. Effective liaison with other departments has been established, and the contribution to the teaching of medical students is substantial. The Department's residency programs are attracting a large number of qualified applicants. The affiliated hospitals are convinced that their residency programs are contributing to improvements in the quality of patient care and the continuing medical education of their staff.

Further, there is every evidence that the state's needs are being effectively addressed by this Department's coordinated efforts. The proportion of graduating medical students from the University of Minnesota who choose family practice residencies is impressive. In 1977, 28 percent of the graduating medical students matched with family practice residency training programs. During the past three years, the two major fields selected by medical school graduates from the University of Minnesota were family practice and internal medicine. A preliminary estimate in 1972 suggested that the State of Minnesota would require a 125 new family physician graduates each year for the next ten years to meet its needs. It is predicted that there will be a total of 72 physicians in each year of the residency training programs in Minnesota. This growth in programs clearly represents an effective response to the state's needs for graduate training in family practice.

An excellent record has been demonstrated by program graduates. Of 239 former residents in family practice residency programs affiliated with the University of Minnesota, 168 (70 percent) are now in private practice; of these, 110 (65 percent) practice in Minnesota and an additional 25 (15 percent) are in practice in the surrounding region (Dakotas, Iowa, and Wisconsin); 19 have changed specialties; two have entered academic medicine; and the remaining are primarily in the military or public service.

The most pressing problems affecting the continued development of the Department are in three areas. First, faculty recruitment continues to be a challenging problem, as in many other family medicine departments. The difficulty is in the identification, recruitment, and development of experienced family physicians with interest and skill in teaching. Secondly, the Department is heavily dependent upon the continued flow of a high level of state funding. Any reduction of this level could have a major impact on the Department's efforts and effectiveness. Thirdly, while much progress has been made in the development of mutually productive interrelationships between the University and its affiliated community hospitals, further sharing and cooperative efforts in teaching, quality control, and research remain to be developed. In particular, the affiliated

relationships with Hennepin County General Hospital, St. Paul Ramsey Hospital, and the Duluth Program can benefit from an increased level of cooperative interaction to meet mutual needs.

On a national basis, the Department has recognized from its beginning the opportunity and responsibility to contribute to the total knowledge of education in family medicine. It has shared information freely through

publications and national meetings. The contributions of the Department have been many and are continuing, but three areas should be particularly noted.

1. Working relationships have been developed with community hospitals to provide mutual benefits for the institutions and to strengthen teaching capabilities. These relationships include the establishment of the Family Practice Centers as nonprofit corpora-

tions.

2. The development of evaluational instruments and systems has been a major thrust of the Department and continues at all levels.

3. Within the behavioral science teaching program there has been a concerted effort toward teaching communication skills. New methods are constantly being investigated and evaluated and the results shared.

Medical University of South Carolina

Introduction and Overview

In 1969 South Carolina was 48th of the 50 states in physician/population ratio. The greatest need was for family physicians. The Medical University of South Carolina, then the only medical school in the state, accepted the responsibility of meeting the shortage of family physicians by establishing a full-status, major Department of Family Practice in May 1970. There has been a remarkable degree of encouragement and financial support as well as excellent cooperation from all other departments in the establishment of this new Department.

Currently there are 25 full-time faculty members including 15 physicians. The full-time members of the Charleston faculty represent a wide range of expertise in such areas as: (1) nutrition, (2) geriatrics, (3) behavioral science, (4) medical ethics, (5) anthropology, (6) social work, and (7) computer technology.

The Department of Family Practice has as its objectives the teaching of the concepts of family practice at graduate and undergraduate levels, the demonstration of the modern specialty of family practice, the pursuit of relevant research, and the support of the Affiliated Family Practice Residency Programs throughout the State. The divisions within the Department function primarily in Charleston, but each Division Chief meets regularly with his or her counterpart in the affiliated residencies throughout the State.

The Department of Family Practice is now organized into six divisions, each headed by a senior faculty member. There is a division to address each

of the following areas: (1) undergraduate education, (2) graduate education, (3) behavioral science, (4) research, (5) evaluation, and (6) geriatrics.

Division of Undergraduate Education — This Division has 60 hours of required curriculum time in the first year. During this period the clinical rationale for the specialty of family practice, the common disorders seen in family practice, emergencies, and diagnostic anatomy are covered through family and patient presentation with a multidisciplinary approach. The curriculum will use the family life cycle as a lattice for the entire course next year, beginning with pediatrics and ending with geriatrics. The Department also offers a variety of electives, including both preceptorships and clerkships for third and fourth year students.

Division of Graduate Education — This Division is responsible for the curriculum of the Charleston Residency Program and for defining and achieving its educational objectives. The operation of the Family Practice Model Unit and all of the hospital rotations and other learning opportunities within the Medical University program are managed by this Division.

Division of Behavioral Science — This Division includes eight full-time faculty members who give formal presentations, supervise residents in their care of patients, serve as co-counselors with residents, and manage selected problems at the residents' request. Television monitoring is used extensively and is available in every examining room. Both a family physician and a behavioral scientist are scheduled to be on duty at all times in the monitoring room of the Charleston

Family Practice Center. Immediate feedback can be provided to residents who are observed; in addition, desired segments of their interviews are recorded, reviewed, and discussed.

Division of Research — The mission of this Division is to encourage and develop scientific curiosity and investigative skill among the residents and faculty. Members of the Division are available to residents throughout their training. Also, a one-month elective opportunity is available. Many types of research are possible, including an epidemiological study of the community in which a resident might choose to locate. Elaborate computer facilities are also available and are used extensively in the computerization of the medical records in Charleston.

This Division is responsible for all research conducted within the Department and must approve any studies undertaken by faculty members, residents, or other members of the Medical University who may wish access to any family practice patient data. All patient data for the past seven years are stored in the computer and are immediately available for research purposes. There is high interest among the residents, and several faculty members are actively engaged in research.

Division of Evaluation — This Division is responsible for the development of procedures for resident and faculty evaluation, and evaluation of the residency as a whole. Procedures for chart audit have been developed. The annual In-Training Examination is a big event during which each resident has an extensive written and clinical examination. This Division provides evaluative services for all residency programs of the Statewide Family Practice Resi-

**Table 2. Statewide Family Practice Residency System
Medical University of South Carolina**

	Established	New Residents Per Year	Capacity	Residents Now In Training
Spartanburg General Hospital	1970	12	36	29
Greenville General Hospital	1971	12	36	29
Richland Memorial Hospital, Columbia	1975	10	30	11
Anderson Memorial Hospital	1975	8	24	14
Medical University Program, Charleston	1970	15	45	45
Self Memorial Hospital	1978	4	12	—
McLeod Hospital, Florence	1978-1979	6	18	—
Totals		67	201	128

gency System (SFPRS). All residents in the Charleston Program are required to take this examination annually; the affiliated programs are encouraged to participate. The results of the examination are available to the resident and his/her faculty advisor and/or Program Director.

Division of Geriatrics — This is the newest Division. It is developing a teaching program in a nearby nursing home as well as didactic presentations for undergraduates and residents.

Statewide Family Practice Residency System

The Department is deeply committed to the success of the Statewide Family Practice Residency System (SFPRS). In 1973 the Governor urged the training of more family physicians. This prompted a proposal by which a SFPRS would be developed that would include the three existing programs and add four new programs. To provide one family physician for each 2,400 persons in the state by 1985 would require a system which could produce 67 family physicians each year or have the total capacity of 201 training positions. The program was to be implemented over a period of four

years at a total cost of approximately \$22 million. Total capital funding and 60 percent of the teaching operational costs were to be provided. This was approved and funded.

The capacity and development of each Program is shown in Table 2.

Development of the system has been slower than planned because of lengthy start-up times and difficulty in recruiting directors and faculty. In the fourth year of the project 128 positions are filled, which represents about 64 percent. The system will be completely developed by 1979. The following describes each of the five currently operational programs.

Charleston — The University-based Family Practice Residency Program at Charleston is now well established with a total of 45 residents — 15 in each year. The Family Practice Center is an attractive, one-story facility of 30,000 square feet located within easy walking distance of the 500-bed Medical University Hospital, three affiliated community hospitals, and a large Veterans' Administration Hospital.

First year residents are assigned to the Family Practice Center their first two months. The curriculum in the Medical University-based program includes approximately eleven months

of internal medicine and medical subspecialties, five months of pediatrics and its subspecialties, two months of obstetrics/gynecology, four months of surgery and surgical electives, two months of emergency medicine, and eight months of electives. Two separate one-month behavioral science rotations are required in the second and third years of the Program.

The 45 residents are divided into five practice groups, each with a family physician, behavioral scientist, dentist, pharmacist, physician assistant, nurse, and LPN as faculty members. A computerized problem-oriented medical record is used. All information is available from cathode-ray terminals — located in every room — and also from computer typewritten paper records. A computerized life-events program has been developed for use in patient care, teaching, and research. The computer is also used for management of appointments and the billing of patients for services. Residents spend one half-day per week in the Family Practice Unit during the first year, three half-days during the second year, and four half-days during the third year.

Spartanburg — The Spartanburg General Hospital Family Practice Residency Program is located in a modern office setting in the ambulatory care building, which is attached to the 500-bed hospital. It is designed to accommodate 12 residents per year or a total of 36. There has been a problem of attrition which has reduced the number of senior residents appreciably. The three-year curriculum includes 12 months of internal medicine and 6 months of pediatrics. A wide variety of electives is offered and a two-month rotation is required in community medicine. Also required is two months in "psychiatry and ambulatory psychological medicine," an offering made possible by a half-time psychiatrist on the faculty. Residents spend three half-day sessions per week in the Family Practice Center during the first year, four during the second year, and five during the third.

Greenville — The Greenville General Hospital Family Practice Residency Program began in 1971. The Family Practice Center is presently located one mile from a 600-bed community hospital, but a new building is under construction which will place it very near a newly constructed hospital complex where there is ample parking.

Two training plans are offered to residents depending upon their wish to include obstetrics in their practice. Those electing obstetrics include nine months of internal medicine, eight months of pediatrics and six months of obstetrics, with a variety of subspecialty rotations. Those not electing obstetrics have ten months of internal medicine, nine months of pediatrics, and the minimum of two months of obstetrics/gynecology. The residents spend one half-day each week in the Family Practice Center during the first year and one half of each day at the Center during the second and third years.

Columbia — The Richland Memorial Hospital Family Practice Residency Program is located in the State capitol. The Family Practice Center comprises the largest part of a new and modern ambulatory care building adjacent to the newly constructed modern 500-bed hospital. This Program, whose curriculum is patterned after that of the University Program, has a capacity of ten residents in each year.

A new medical school is being developed at the University of South Carolina in Columbia, and the Family Practice Residency Program is expected to form the nucleus of the Department of Family Practice for the new school. This Residency Program will continue to be a member of the Statewide Family Practice Residency System and will maintain its close relationship with the Medical University Program at Charleston.

Anderson — The Anderson Memorial Hospital Family Practice Residency Program was established in 1975. A new Family Practice Center has just been completed which provides clusters of rooms around nursing stations, facilitating an interdisciplinary team approach.

This Program has a capacity for 12 residents in each year. The curriculum is similar to that at the University, including the required preceptorship. A one-month, community medicine rotation during the first year is required. Residents are required to spend two half-days per week in the Family Practice Center during the first year, three during the second year, and five during the third year.

Common Educational Approaches

A common characteristic of each of the Programs is the emphasis on

quality education. The development of good practice habits is stressed, as well as the utilization of teachers, who are always available in the units. In each, the ratio of teachers to residents is relatively low — averaging five to one or less. While ample time is provided in the practice units for residents to practice, the pace is relatively slow, and direct supervision is always available and encouraged. Some faculty members continue to maintain patient care activities, but in a very small proportion of their time. Resident supervision is conducted through chart review, personal observation, and television monitoring. The use of television for both monitoring and video taping is extensive in all of the Programs. The procedure, thought to be essential as a basic educational tool, has come to be regarded as commonplace by both patients and residents.

A second commonality is the availability of computer resources for medical record storage and data analysis. At Charleston, extensive experimentation has been conducted with computer storage of all medical record data. The entire dictated note and all data are entered into the computer. All computer services are available to all programs within the Statewide System, but they are used less extensively in the other Programs.

Behavioral science is taught in all of the Programs. A major goal of the Department, from the beginning, has been to achieve a balance between teaching in the behavioral and biological sciences. The Division of Behavioral Science provides teaching at the University Program and also serves as a resource for statewide members. Within the system, each Program is free to choose its faculty to meet its own identified needs, and each Program has chosen to appoint a behavioral scientist as one of the full-time faculty members. These persons are of varying backgrounds, but most are clinical psychologists. The activities in most Programs include didactic teaching and working with patients, usually with the resident involved. Faculty members usually do not serve as consultants for referral, but provide patient care only through the residents. Each is responsible to the Program Director at his/her own location and not to the Division of Behavioral Science. When faced with a clinical-behavioral problem, residents in all of the Programs

report that the usual procedure is first to consult with a seasoned family physician from the staff. A second source is the behavioral scientist in the resident's own Program. The ultimate source for the most complex problems is consultation with a psychiatrist.

Evaluative procedures are available to all the SFPRS Programs and are used by all to varying degrees. As described earlier, the Division of Evaluation in Charleston has developed a series of instruments designed to provide a broad measurement of achievement, including patient management skills. Continuity of care is a major concern and has resulted in a fixed policy affecting all residents in the system. It is required that every resident spend at least 33 of his or her 36 months maintaining some activities in the Family Practice Centers. Thus, a resident is not able to take elective courses away from the Family Practice Center for more than a total of three months during the training program.

All of the Programs have developed regular, daily conferences at noon, which vary widely in type and purpose, and which are frequently conducted by residents. The many patient-centered conferences are used to demonstrate the different approach of the family physician. Attendance is expected.

Administrative Aspects

Each of the Programs of the SFPRS is almost autonomous, having been separately accredited by the Residency Review Committee and having its own matching number in the National Intern and Resident Matching Program. The Departmental Chairman shares the overall responsibility for all of the educational programs but each may determine its own curriculum within broad limits, taking full advantage of community resources and characteristics of the hospital and staff. This flexibility and the varied curricula offered permit applicants to choose a program which will suit their individual needs. All full and part-time teachers must be reviewed and approved by the Medical University Appointments and Promotions Committee for appointment in the Department of Family Practice. Faculty members at the Medical University are available for consultation and for

teaching in the affiliated programs. Likewise, teachers in the community hospital-based programs are welcomed teachers at the University.

SFPRS monies are distributed to the various programs according to a formula, based largely on the number of residents in training, which covers all capital costs and 60 percent of the costs of the educational program. Costs such as nurses' salaries are not covered. Each program contributes substantially to the operating costs from its sponsoring hospital, federal grants, fees from patient care, and the Area Health Education Center (AHEC). Also, some faculty support is available through the Medical University consortium, which provides for undergraduate educational experiences in several of the sponsoring hospitals. Statewide funding provides for a teacher-resident ratio of one to six in addition to the Director and Assistant Director. An even lower ratio is projected for the future. Some Programs presently use funds from other sources for additional full and part-time teaching. In South Carolina, AHEC functions statewide and has contributed \$318,000 to family practice education during the current academic year.

The cost per resident at the present time is estimated to be \$31,000 per year. When the system is completely developed there should be greater cost effectiveness, so it is projected that in the future the figure will be decreased to \$28,000.

Comment

One obvious and great strength of the South Carolina system is its abundant and apparently dependable funding, which has provided an opportunity for imaginative advanced planning. Total funding is available for capital development and a matching arrangement with community hospitals for operating expenses. The question must be raised as to the future of the Program if legislative funding should suddenly cease even though any abrupt termination would seem extremely unlikely because of the success of the Program in approaching its goals. The system is designed to provide considerable financial strength, since operating budgets include funding from multiple sources. So it could be anticipated that if state funding

should cease, these Programs could continue, although at a markedly curtailed size.

The SFPRS has proven to be a sound working relationship between community hospitals and the university, with advantages to both. Resources (talent, consultation, direction, initiatives, funding) are available to community hospitals, without stringent controls. This arrangement has encouraged variability among programs while at the same time maintaining quality control. The University benefits by the exchange of ideas and through the advantages of increased size and statewide impact. Funds are used by the University Program to develop new ideas — possible only within an academic center — which are then shared with community programs.

The attrition problems of two of the community hospital programs are puzzling and not yet fully explained. Within the University Program the attrition rate is one of the lowest in the nation. Numerous explanations are possible and will warrant further investigation.

Although the projected number of residents in the SFPRS at the present time is less than originally planned, the development seems to be proceeding at an acceptable pace. The high retention rate of physicians in the state may well offset the lower than anticipated number of graduates. To date there have been 79 graduates of the Statewide Family Practice Residency System, including 41 from the Charleston Program, 19 from the Greenville Program, 8 from the Spartanburg Program, and 1 from the Anderson Program. Of these graduates, a total of 45 (57 percent) have established practice in South Carolina. Almost one half (46 percent) of Charleston graduates have remained in South Carolina, whereas over two thirds of graduates from the other programs in the SFPRS have stayed in the state.

The University Program at Charleston has accepted responsibility for exercising leadership in developing educational methods in family medicine. While the contributions of this Program have been many, two of the most notable are in the development of an emphasis on behavioral science teaching in family medicine and in the use of the computer in medical records. The fact that each of the

community hospitals has chosen to include at least one full-time behavioral scientist in its faculty is evidence of the success of the parent program in demonstrating the value of the contribution of these faculty members to the teaching of family medicine. The use of the computer has been less well accepted by community hospitals, partially because many aspects are still developmental and partially because both the future funding and direct benefits are less clear.

One of the most outstanding strengths of this Program is the evident enthusiasm and strong support from other disciplines within the University and within the community hospitals. This kind of support is also much in evidence from the administrative arms of these institutions.

It is interesting to note that the directors of the Programs are individuals who have had extensive personal experience in private family practice prior to entering into their present roles. This is also true of most of the senior faculty who serve as the chiefs of the various divisions.

Another great strength of this entire system is the overwhelming emphasis on teaching. Ample evidence for this is shown in the teacher/resident ratio, in programs for instructing teachers, in the close supervision of residents at all levels, in the extensive use of chart audit, in the daily conferences at noon, and in the all-pervading use of the video camera. Other evidence includes the carefully paced patient schedule — typically one patient per half hour. The stated reason for this is to provide adequate time for discussion, reading, recording, and reflection.

Another growing aspect of this Program is an emphasis on evaluation, demonstrated by the full Division designed for evaluative purposes. That Division has developed extensive instruments, currently being validated, which should provide both a measure of success and a useful teaching tool.

One of the greatest contributions of this Program that may, perhaps, be of national interest, is the demonstration to legislators that meeting the need for family physicians can be accomplished through the development of the highest quality programs at predictable times and costs.

Medical College of Virginia

Introduction and Overview

In Virginia the need for primary care physicians was first recognized as reaching crisis proportions in rural areas. The Virginia Academy of Family Physicians joined with the Farm Bureau and the Virginia Council for Health and Medical Care (a private foundation) to seek legislative help in finding a solution to the problem. This triad began efforts to educate the legislature in 1966. Every legislator was contacted by his or her family physician. The coalition began to gather data and to educate both the legislature and the public concerning the need to replenish Virginia's family physician population.

In 1968 the Virginia State Legislature appointed a subcommittee to study the shortage of family physicians and subsequently documented both the shortage in numbers and the discrepancies in distribution. In 1969, following a period of data gathering, documentation, and public education, specific funds were made available to the two medical schools in Virginia — the University of Virginia and the Medical College of Virginia — for the purpose of family practice training. The legislature did not specify administrative structures but permitted the schools to develop their own programs.

The Medical College of Virginia chose to establish an autonomous Department of Family Practice which became a reality in July 1970. A family physician was identified who was in active practice in Virginia and who had written articles concerning the need for family physicians, criticizing the University for not attending to the training of family physicians. A search committee nominated this physician as a person with the necessary leadership skills and motivation to head the new Department. He was confronted by the Dean with his own criticisms and challenged to "put up or shut up."

He accepted the responsibility, and the first priority identified in the development of the Department was the establishment of informational systems which would provide data in two areas: (1) the population of existing physicians in all forms of primary care in relation to the patient popula-

tion in each political subdivision of the state, and (2) the content of primary care in terms of numbers and kinds of problems presented to primary care physicians.

The first collection of data was completed in 1972 and provided a basis for projection of Virginia's primary care physician needs over the next 20 years. It has been generally accepted as accurate, reasonable, and achievable. It calls for an annual production over the next 20 years of 111 primary care physicians per year for Virginia, of which 75 should be family physicians. The Medical College of Virginia's proportionate responsibility of this expressed need is considered to be between 36 and 42 family physicians per year. A resurvey was conducted and the projections updated in 1975.

About the same time, a massive study was begun to identify the numbers and kinds of problems Virginians present to primary care physicians. A coding and data retrieval system was developed. Data were collected on the primary care experiences of 88,000 patients in 26 practices representing a variety of both private practice and academic settings. A careful analysis was made of over 500,000 patient encounters.* One of the interesting conclusions drawn from this study was that in the urban, suburban, and rural areas studied, the same patterns of medical problems existed, and that these were identifiable and relatively constant within and between practices.

Having identified the needs in terms of numbers, kinds, and distribution of physicians, a program was developed to meet these needs. It was decided to begin at the residency-training level because of the possibility for earliest results. Family practice was established as a full and autonomous Department of the College of Medicine of the Medical College of Virginia. The Chairman, Associate Director, and staff represent the Department, which is physically located at the College of Medicine at Richmond. It was decided to establish four Residency Programs at first, based geographically in the shortage areas identified in the data

*Marsland DW, Wood M, Mayo F: A data bank for patient care, curriculum, and research in family practice: 526, 196 patient problems. *J Fam Pract* 3:25, 37, 1976

collection study: Fairfax, Blackstone, Newport News, and Virginia Beach. A Program was not established initially at Richmond — the location of the Medical College — because the study indicated Richmond as an area having the least need for family physicians.

While the Department's major focus is in the resident program, it is also directly involved in teaching at other levels. At the *undergraduate level* the Department has responsibility for conducting a third-year, required community hospital rotation. While students may elect various specialties with which to associate in these rotations, a large number choose family medicine and the course is coordinated by that Department. The Department also plays a major part in the human behavior course offered by the Department of Psychiatry for first and second year medical students. A variety of electives are offered for first, second, and fourth year students. These electives combine carefully designed experiences in teaching practices with conferences at the medical center involving students, faculty, and clinical faculty.

A variety of *continuing education* opportunities for practicing physicians is also provided through the Department of Family Practice. In all of the Residency Programs, noon conferences have been approved for category I credit and are often attended by practicing physicians. At the rural location of Blackstone, Virginia, the resident journal club has become a major continuing education attraction for physicians from throughout the area. The Department also participates in the primary care continuing education activities of other clinical departments.

The Affiliated Residency Programs

Each of the five Residency Programs has unique features forming an individual personality, but all have some common features also. The patient populations are demographically typical of the various localities in which they are situated. The total number of patients served by the five Family Practice Centers is 75,000. Data from the 23 practicing physicians in Virginia whose practices were studied, indicate that the spectrum of problems encountered in the Centers is

**Table 3. The Affiliated Residency Program*
Medical College of Virginia**

Program Sites	Number of Residents	Year Started
Blackstone	18	1971
Fairfax (Vienna)	18	1971
Newport News	36	1970
Virginia Beach	18	1973
Chesterfield (Richmond)	18	1976
Total	108	

*There is not a full University-based Program (including a Family Practice Center) on the Medical College of Virginia campus. Most of the inpatient clinical rotations for the Blackstone Program are conducted at the University Hospital. The Family Practice Centers and their related community hospitals provide the major teaching settings for family practice residents during the entire three-year Program.

almost exactly the same as the spectrum presented in private practice. Each Residency Program is related to a full-service hospital, and each has modern office facilities with appropriate laboratory and x-ray services. All maintain problem-oriented records and have an informational system which allows immediate identification of patients and particular problems for use in preparing for the daily conferences. This information is also collected in Richmond and computerized for use in statistical and epidemiological studies for educational planning and research purposes. Table 3 presents an overview of the five Affiliated Family Practice Residency Programs.

Blackstone — The Blackstone Family Practice Center is located predominately in a rural section of southern Virginia, approximately one hour from the Medical College of Virginia (MCV) in Richmond. It is the only medical facility in the town of Blackstone and delivers all primary care services to the community. The three physicians who were located in the community developed the Family Practice Center and constitute the full-time teaching faculty. The Center provides ongoing family care for approximately 11,000 people from the area.

During the first year, residents rotate through MCV hospitals in Richmond in all the clinical areas, and each

resident spends a full day every two weeks in the Family Practice Center with patients to whom he or she has been assigned.

After finishing the first year, residents physically move to Blackstone but spend four months in elective hospital rotations either in MCV or in community hospitals in the Richmond area. Residents spend approximately half their time in patient care and the other half in teaching conferences and other academic pursuits. Patients from Blackstone are hospitalized primarily in Richmond. Referring residents make rounds to in-hospital patients approximately twice weekly, but referred Blackstone patients are usually seen daily by family practice residents who are on rotation in Richmond. First year residents see approximately five patients per day, and second and third year residents, about eight to twelve.

The Center teaches a total of 18 residents: six each in the second and third years, who spend most of their time in the Center, and six first year residents, who are there briefly.

Fairfax — The Fairfax Family Practice Center is located in Vienna, Virginia, and occupies an entire second floor of a modern office building in a suburban business area. The Center includes a large conference room and offices for each resident, as well as

laboratory and x-ray facilities. The Center, with an enrollment of 11,000 people, serves approximately 2,000 patients from the area per month. There are 12 residents: six in each of the second and third years, plus an additional six first year residents who are in attendance at the Center one half-day per week. Each resident provides care for approximately 100 families.

All hospital work is performed at the Fairfax Hospital, a 600-bed, general hospital located nearby.

Newport News — The Riverside Family Practice Center is located at Newport News and was the first model training center affiliated with the Medical College of Virginia. Riverside Hospital is a community facility with more than 600 beds.

The Program provides educational opportunities for 36 residents in family medicine, plus an additional six first year family practice residents who receive their first-year in-hospital training in this program, with the family practice training at Virginia Beach. Riverside residents spend one half-day per week in the Family Practice Center during the first year and approximately half time during their second and third years. Third year residents have a one-month required rural experience with a practicing family physician.

The Family Practice Center is in a recently constructed modern building and provides 14 examining rooms, although there are plans to almost double this space in the near future. Both x-ray and laboratory facilities are available within the unit. Care is provided for 14,000 patients through approximately 2,300 encounters per month. Unlike the other three MCV programs, the patient population here is largely indigent, with only about 25 percent paying privately. The practice profile of problems presented, however, is comparable with that of other MCV programs and with private family practices in the area.

Virginia Beach — The First Colonial Family Practice Center is located in the city of Virginia Beach. Six residents per year are accepted in this Program. The first year is spent at Riverside Hospital at Newport News, during which time residents return to the First Colonial Family Practice Center in Virginia Beach one half-day each week. Second and third year residents

receive their family practice training in the Virginia Beach Center and the General Hospital of Virginia Beach, a 400-bed, full-service hospital.

During the first year, residents see an average of six patients per day. During the second and third years, residents are assigned responsibility for 100 to 200 families. Approximately half the residents' time at the Center is spent in patient care and the other half in academic pursuit. While the residents spend a large part of their time during the second and third years in the Family Practice Center, four months are available each year for elective rotations.

Family practice patients are usually hospitalized at the General Hospital in Virginia Beach and cared for by the family practice residents from the Center. The patient population includes approximately 20,000 people and is representative of all social groups.

Chesterfield Family Practice Center

— The newest member of the MCV residency family group is the Chesterfield Family Practice Center, located in the southside of Richmond, six miles from the Medical College of Virginia. Its associated hospital is the Chippenham Community Hospital, a full-service hospital with bed capacity approaching 400 at the present time.

This Program also accepts six residents at each level and provides teaching in the same general format as the other MCV programs. Residents spend one half-day per week in the Family Practice Center during the first year and two thirds of their time there during the second and third years. Elective opportunities are available for four months in both the second and third years in both the Chippenham Hospital and in the MCV hospitals in Richmond.

Common Educational Approaches

The basic philosophy of the Department continues to advocate a systems approach: identify the data needed, devise the systems to collect the data, collect and analyze the data, and develop programs based on the analysis. This has been the approach used for (1) developing a system of Residency Programs in geographical locations of physician need and (2) for developing an educational program based on an ongoing analysis of what family physicians need to know.

The initial curriculum had been

developed on the basis of the opinion of the faculty as to the needs of family physicians. The faculty is convinced, however, that this method of determination is faulty and that curriculum ought to be based on the problems encountered in practice. A major effort has been expended to develop the necessary data base for curriculum closely related to known content of practice. The curriculum was organized in accordance with the "special requirements for residency training in family practice" of the Essentials of Approved Residencies.* It is currently being modified by the actual experience as recorded in the data system; and ongoing efforts are being made to complete a set of objectives and an evaluative mechanism based directly on the data accumulated.

A general review of the curriculum of the five component members of the Medical College of Virginia system reveals a typical rotating program with the greatest emphasis on internal medicine, plus block-time in pediatrics, obstetrics/gynecology, surgery, and emergency medicine, a short elective, and minimal time in the Family Practice Center. The most striking departure from the usual curriculum occurs in the second and third years, during which the major emphasis in teaching all disciplines occurs in the Family Practice Centers. Active teaching is conducted by regularly scheduled daily consultants and by the family physician faculty. In these two years there are only eight months of required in-hospital rotations and eight months of elective time, which may be both inpatient and outpatient experiences.

As in many programs, there is an absence of any required rotation in psychiatry. In-hospital psychiatry is available as an elective at most member Programs, but basic teaching occurs in patient-oriented conferences on a longitudinal basis with generous use of both psychiatric and behavioral science consultants.

In the management of psychological or emotional problems, residents turn first to faculty family physicians and secondly, to consultants in behavioral science or psychiatry, depending on the availability of particular consultants.

*American Medical Association: Special requirements for residency training in family practice. In *Essentials of Approved Residencies*. Chicago, American Medical Association, 1975

Opportunities are made available for participation in special research projects, community activities, and practice management. Practice management techniques are taught through the offices of a full-time faculty member in practice organization and management. This person is charged with the responsibility of providing each resident with the opportunity to participate in the actual unit management and to provide access to information regarding practice locations, building plans, methods of financing, legal arrangements, insurance, accounting methods, office procedures, personnel policies, and the related basics of practice management.

This general curricular plan, with diminished inpatient teaching, expanded specialty teaching in the Family Practice Center, and only outpatient psychiatric teaching, corresponds precisely with the Department's commitment to a curriculum based on practice content. Teaching methods in the past have often been on an apprenticeship basis. The leadership of this Department believes that this is not the best method — in fact, the apprentice is not likely to learn more than his or her instructor knows. Consequently, new methods are being sought and are relying heavily on the consultant-conference in the family practice setting and on clinical investigation projects.

The Audit and Evaluation Procedures of the Medical College of Virginia Programs are similar in each Program: original, extensive, and continuing. Philosophically, the attitude is that "episodic audit leads to episodic care." Evaluation of residents in the teaching/learning process is based on the standard of patient care delivered by each resident over the three year continuum. The attempt is made to develop in the physician's mind the continuing appropriateness of self-examination and assessment of patient outcomes as the most valid measures of personal success. It is actually a process of continuing education.

An additional precept is the belief that to be effective in the field of health maintenance, family physicians need detailed knowledge of their practice community in terms of number of patients by age, sex, distribution, and kinds of problems which affect them. This information permits the physician to identify various high-risk groups for

specific health educational purposes. It permits the physician to see his or her patients as members of family groups making up the larger community, where the largest proportion of health care usually remains unsupervised and unmonitored until the patient chooses to return to the office. Effective health maintenance requires complete practice information for adequate practice monitoring.

The methodology that has been established to permit this ongoing evaluation consists of: (1) a problem-oriented medical record adapted to family practice, (2) a census tract filing system, (3) an age and sex index with a record of demographic characteristics for a diagnostic index classification (soon to be converted to the International Classification of Health Problems in Primary Care System), (4) a physician's daily work sheet, permitting the recording of biological, behavioral, and social problems of identified patients for classification with the diagnostic index, and (5) an E-book, maintained for the resident by a staff coder.

These instruments form an ongoing evaluative system which is functioning in all MCV programs and is funded by the educational component. Data from the daily work sheets are key-punched (through a unique arrangement with the State Penal System) and entered into the computer at the Medical College. In order to check the similarity of residency practices with those of private physicians, additional data are being collected from 23 separate nonteaching practices in the state. This provides a total patient population base of greater than 100,000.

This system has permitted evaluations of a resident's performance in three ways: (1) structural adequacy and completeness of the resident's problem-oriented medical record; (2) measurement of the resident's capacity to achieve the minimum critique, established by faculty and residents, for *diagnosis* of a condition; and (3) measurement of the resident's capacity to achieve the minimum critique, established by faculty and residents, for *management* of a condition.

The resident's strengths and weaknesses are identified, allowing for adjustment of patient and elective experiences to repair any deficiencies. An additional capacity of this system, which is currently being pursued by a

number of residents on an elective basis, is the "longitudinal audit." In this form of audit all patients with a particular problem at one practice location are identified. The patient charts are analyzed in detail for both process and outcome, and for associated additional problems. The information generated provides new insights into the value of various procedures and identifies previously unsuspected but related problems. It is then available for curricular modifications.

Administrative Aspects

Each of the five Residency Programs is under the direct leadership of a full-time, family physician Program Director. The key to the relationships throughout the system is a very personal one in which each of the component programs is considered a partner to the others. Functionally, this system operates through three standing committees: the Records and Research Committee, the Curriculum and Evaluation Committee, and the Practice Organization and Management Committee. Faculty from each Family Practice Center and residents from each level of training constitute the membership of these committees. The faculty at the Medical College of Virginia coordinates the activities of these committees. The Chairmen of each of these committees plus the Program Directors and Chairman and Associate Director of the Department form the Executive Council. These committees are advisory to the Council and, functionally, they serve as full partners in all decision-making areas within their purview.

The full-time faculty of the affiliated programs have been largely recruited from the communities in which they serve. Frequently, faculty members have brought their practice into the educational system. The faculty is chosen on the basis of clinical excellence and educational interest, and members serve as partners in the management of the educational system as well as directors of patient care within the Residency Program.

A carefully selected consultant faculty in all appropriate specialty areas is available in each Residency Program. These faculty members are compensated financially and, after a trial period, offered faculty rank. Consultants provide patient care advice and daily clinical conferences. The

conference is of several hours duration and is part of a planned curriculum covering the entire spectrum of problems which have been identified as important in family practice.

Payment for all full-time faculty salaries, consultants, and second and third-year stipends and clerical personnel is funded through the educational system itself rather than the participating hospitals in all but one Residency Program. Because of this mechanism, it is possible to make decisions regarding reallocation of funds by educational rather than institutional needs.

Each of the affiliated programs has received individual accreditation and therefore each has a separate matching number in the National Intern and Residency Matching Program. While resident applicants have increasingly come from Virginia medical schools, there are also highly qualified applicants from out of state.

The funding mechanism for this Program began with an initial allocation by the state legislature of \$228,000 in 1969 for the biennium 1970-1972. The state continues to be the major source of support for the entire system, currently appropriating approximately \$1.8 million per year, provided by direct line-item budget to the Department of Family Practice. Initially there were some difficulties within the institution apparently related to a lack of appreciation of the University's need to train a new type of physician to meet Virginia's rural needs. However, as it became apparent that the Department of Family Practice was not subtracting from the University's total resources but adding to its capability by developing affiliated programs, these difficulties greatly diminished.

Approximately 88 percent of the state funds are distributed to the member Residency Programs. The formula for this distribution provides full support for resident stipends at each location only in the second and third years. The first-year stipends are paid by the affiliated community hospitals. State funds are distributed by the Department of Family Practice and pay for a portion of faculty salaries plus full support of an educational and secretarial staff; an additional \$60,000 is distributed to each Program for consultants in a variety of clinical fields. The general formula for support

in each Program is for approximately three full-time faculty members and two secretaries per each 12 residents in the second and third years. (Since first year residents spend little time in the family practice unit, they are not included in the formula.) The allocation for consultants amounts to approximately \$240 per day per program throughout the year.

The three Departmental faculty persons and staff located in the medical school are funded by the College of Medicine with Departmental and grant funds. Each of the component Programs receives additional support in varying degrees and methods from the hospital in which they are situated and through federal grants. The approximate cost per resident per year at the Medical College of Virginia is \$30,000.

Comment

The Department's statistical determination of Virginia's family physician needs over the next 20 years comprises the only data available. It has been generally accepted by all authorities as accurate, reasonable, and achievable. It calls for an annual production over the next 20 years of 111 primary care physicians per year for Virginia, of which 75 each year should be family physicians. The Medical College of Virginia's proportionate responsibility of this expressed need is considered to be between 36 and 42 family physicians per year. The Department's five present Programs accept 36 physicians each year for residency training.

An analysis of the family practice graduates from the MCV Programs through 1976 indicates that 62 percent of the total of 76 graduates have chosen to stay in the state of Virginia. An additional 22 percent have located in nearby areas. Sixty percent of these graduates have chosen to practice in nonmetropolitan areas.

The major goal of the Department of Family Practice is to increase the availability and quality of primary health-care services for the people of Virginia. While this has been the primary goal, the leadership of the Department has recognized the need for academic pursuits as well. While these activities have enriched the Program and assisted in achieving its primary goal, they have had an even greater impact on the development of the new discipline of family medicine through better definition, understanding of

process, and development of innovative educational methods. The Medical College of Virginia's family practice program has made enormous strides in a very short period of time, based on a carefully planned systems approach.

Several interesting or potential problems have arisen and are currently being addressed.

1. The teaching of behavioral sciences in these Programs through intermittent use of consultants rather than through their constant availability has been identified by program directors as a problem.

2. Since a major portion of the funding is derived from the state legislature, any funding decrease would present a hazard to further progress. But because the funding base is built on multiple components it would be anticipated that the Program could continue, although at a seriously reduced size.

3. The educational process described here may be seen to vary considerably from those described elsewhere. This raises the question of determining the value of this educational approach and is one of the most basic of all questions facing the entire discipline of family medicine — how can the results of educational efforts be measured?

The contributions of this Program to the discipline of family medicine and, indeed, to the whole field of medical education, have been considerable and are most notable in two areas — innovative educational methods and ambulatory care research.

The most creative aspect of the curriculum under development at MCV is its foundation upon carefully measured data of the content of family practice. Rarely have curricula been developed on such a rational base.

The extensive research program in ambulatory care has, of course, been instrumental in the development of the curriculum. However, there are other aspects of the Program which are also of great value. The methodology developed is of use to other programs and practitioners in primary care. The size of the sample and the care with which the information has been collected make the "Virginia Study" a standard to which other data may be compared.*

The use of these methods has already proven an excellent educational tool for residents within the MCV system,

and faculty and residents are experimenting with new applications of the system — eg, the "longitudinal audit." The publication of this process and its results have served as a positive motivational factor for residents in other programs as well.

Discussion

The history of the three programs is similar. In each, there was a study measuring the need for primary care physicians within the state and projections of this need during the foreseeable future. In each instance, a university accepted a measure of responsibility for meeting the need and established a full Department of Family Medicine, under various titles, and under the leadership of a strong personality.

In each of these programs there has been direct, abundant, and predictable funding. The funding has been carefully earmarked to provide direct support for the family practice program. While this assistance has provided the necessary lifeblood for these programs, the danger of future loss of funding is recognized. In each instance, multiple financial sources have been identified, involving some federal and private funds, but involving community hospital funds to an even greater extent. It would seem likely that if state legislative funding diminished, these programs could continue, although at a considerably reduced level.

Each of the three Departments, while focusing a major effort on the residency program, is also actively involved in family medicine teaching at other levels. All offer some teaching at the predoctoral level and some continuing education activities. All of these various activities are seen as a continuum of the effort to meet health-care needs through the teaching of family medicine.

Each of the programs involves a network with a number of other hospitals, and each has a considerable degree of autonomy. This autonomy has encouraged the development of a variety of educational programs — deliberately attempting to meet resident needs and to provide for experimentation in the development of new teaching methods. These networks

*Marstrand DW, Wood M, Mayo F: A data bank for patient care, curriculum, and research in family practice: 526, 196 patient problems. *J Fam Pract* 3:25, 37, 1976

have been able to identify some areas of activity which are best conducted jointly: research efforts, educational objectives, general curricular outlines, funding sources, teaching patterns, and methods of evaluation. In each instance there is some organization which promotes communication both with the parent university and among the various members. Through this organizational arrangement there is active input from all community hospital partners, and, in most cases, active input from residents at all levels of each hospital.

Each of these university programs has accepted a role of innovator of new ideas both in research and in teaching methods. In each program this thrust has been different: for example, South Carolina has incorporated behavioral scientists in the faculties; MCV has emphasized careful compilation of problem and demographic data on each encounter; Minnesota has developed a new series of evaluative techniques.

The teaching of behavioral science has been approached quite differently by the three programs. At MCV the teaching is conducted by behavioral scientists or psychiatrists, who are engaged as consultants by the individual program and combine patient care consultation with conferences on a scheduled basis. At Minnesota there is a didactic series of behavioral science presentations, usually conducted at the university, in which residents are expected to participate. This is supplemented by various conferences at the member hospitals. At South Carolina a behavioral scientist is a member of each Program's faculty and teaches through guiding residents in their patient care, as well as through conferences and didactic presentations.

There are two common denominators among the three programs with regard to behavioral science. These are (1) a commitment by each program to include behavioral science as a major component of the educational program, and (2) a consistency of the residents' approach to seeking help when handling human behavioral problems. When asked, residents consistently report that their first source of help is a seasoned faculty family physi-

cian. The second resource is a behavioral scientist, either in the program or as a consultant. Their third source of help, for the most complex problems or deeply disturbed patients, is consultation with a psychiatrist. This pattern has been reported by residents with great consistency at all three programs.

There is interest in all three programs in evaluation through a variety of approaches. Two of the programs, South Carolina and Minnesota, have groups of faculty members whose prime responsibility is the development of evaluative techniques. In all programs the various evaluative instruments are supplemented by the personal evaluation of those with whom the residents work — and this measurement is given great weight.

In each program, although in varying degrees, there is active participation by residents in all phases of the organization and of the decision-making process. This includes various teaching conferences, of course, but in nearly all instances includes programmatic decision making, curricular change, evaluation, and residency selection.

Even though the three statewide systems represent a much larger number (16) of residency programs, the consistently high quality of the programs is quite evident. This quality is manifested both in the University-based programs and in the affiliated community hospital programs, lending strong support to the concept that both are better because of their interrelationships. Along with this high quality there is an attention to the detail of the known ingredients of successful programs — attention to selection, curriculum, evaluation, etc. There is also a strong sense of stability and "belonging" among the faculties of the various programs.

Through a wide array of mechanisms — including work with the legislature, development of nonprofit corporations, and the use of consultants and rotations from other clinical departments — each of the programs has developed a variety of relationships with other institutions and groups. For just one example, at South Carolina the behavioral science division in the

Department of Family Practice has now been asked to teach behavioral science to other departments as well. This type of willingness to explore relationships with new groups and with new means of relating is common to all three programs.

In addition to the attainment of legislative funding for the programs, each organization has successfully sought and found support through a variety of other mechanisms and systems. In South Carolina there is an Area Health Education Consortium which has provided strong financial support. At the Medical College of Virginia an arrangement has been worked out with the state penal system enlisting its assistance in the coding process. At Minnesota the Family Practice Center at each of the community hospitals is being handled through the development of nonprofit corporations. This variety of support systems adds additional stability.

In each program, there is a tendency to consider some aspects a *sine qua non* for a successful program, as exemplified by the inclusion of a behavioral scientist in each program at South Carolina, the extensive use of consultants on a daily basis, and the total coding system at MCV, and the various mechanisms for personnel and group evaluation at Minnesota. But since none of these programs uses all of the emphasized features of the other programs, either the educational products are less than optimal or the features are not, after all, totally essential.

It is of interest to look for the various common denominators of these three excellent programs, of which there appear to be at least six: (1) an enthusiastic and committed faculty, possibly the most important factor, (2) dedication, skill, and interest in the educational process, (3) adequate funding, (4) careful screening of applicants in the selection process, choosing those who would fit best in the particular program, (5) family practice physicians who are able to serve as genuine role models, and (6) an "accepting" environment, both in the university and in the community hospital.