

Research in Family Medicine

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Introduction and Overview

To set the scene for this report, one must go back to the late 1940s and early 1950s. The ferment produced by World War II spread throughout all societies. The technological fallout of war affected medicine, among other sciences, stimulating its scientific aspect and perhaps, in the process, denying the art. The 1950s increased the pace of this movement and the 1960s saw its effects in the overwhelming specialization in medicine throughout the western world, accompanied by the decreasing presence of the generalist.

Society in North America responded to the turmoil of the 1960s by questioning and sometimes rejecting the established order of things. Medicine, as one of the pillars of the establishment, suffered its share of rejection. A focus of this rejection was the unavailability of physicians willing to practice in rural and urban areas of need. This emotive issue, which on occasions reached crusade proportions, was expressed in many ways (often through media, but also by political action at the state and local levels).

The reasons behind it, and the clarifications of the concepts required to correct it, were delineated in a classical series of reports which appeared between 1966 and 1968. These consisted of: (1) "Meeting the Challenge of Family Practice,"* (2) "The Core Content of Family Medicine,"† (3) "The Graduate Education of the Physician,"‡ and (4) "Planning for Comprehensive and Continuing Care of Patients through Education."§

Together, these reports identified deficiencies and suggested requirements for improvement. The last two reports addressed the education and development of the primary physician and made an attempt to divide all care into primary, secondary, and tertiary

elements as a means of conceptualizing the needs of society.

General practice, as it was then called, was part of the primary care element, and its practitioners met many of the requirements of the definition of a primary physician.

They were well prepared to meet the new enhanced role of the primary physician because they had retained their holistic approach to patient care. The traditional concept of responsibility in the profession of medicine is an individual one: physician to patient. Specialization and subspecialization had fragmented not only the practice of medicine but also the relationship between physician and patient. However, general practice was seen to lack a specific area of concern, a visible essential responsibility, a core content of knowledge, and was considered incapable of being taught in graduate or postgraduate medical curriculum. It did not possess its own data base, its own literature, or its own area of new knowledge which could be researched.

As noted by Stephens,* the general practitioners themselves were in difficulty, having been taught by specialists and subspecialists in a medical center

*Meeting the challenge of family practice. The Report of the Ad Hoc Committee on Education for Family Practice of the Council on Medical Education, chaired by W. R. Willard, MD. Chicago, American Medical Association, 1966.

†The Core Content of Family Medicine. The report of the Committee on Requirements for Certification, which was a joint committee of the American Academy of General Practice and the AMA section on General Practice. In Transactions of the 1966 Congress of Delegates of the AAGP, Kansas City, Mo, 1966.

‡The Graduate Education of the Physician. The report of the Citizens Commission on Graduate Medical Education, chaired by John S. Millis, PhD. Chicago, American Medical Association, 1966.

§Planning for Comprehensive and Continuing Care of Patients through Education. The report of the Committee on Medical Schools of the AAMC in relation to training for family practice, which appeared in the Journal of Medical Education 43:751, 1968.

*Stephens GG: Address delivered at the Annual Meeting of the Society of Teachers of Family Medicine, Washington, DC, November 1975.

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environment. They saw themselves as being all things to all people, and their function as being universal. Inevitably, this approach produced a feeling of inadequacy engendered by the impossibility of any one physician being adequately versed horizontally across disciplines as well as in depth in each discipline.

Primary care internists and primary care pediatricians were in a somewhat easier position. They had diminished their societal responsibility by arbitrary age selection but in so doing had fragmented the basic nucleus of society — the family. The general practitioner retained the familial relationship — to some degree everywhere, but perhaps most completely in the smaller communities. This occurred because it was natural and acceptable to both parties. In the mid-1960s, in response to the emotive needs expressed by society and intellectualized by its mentors, the general practitioner redefined the goals and objectives of the general practice discipline and restated his/her responsibilities in caring for individual families and the whole community. The American Academy of General Practice took the leading part in this, and its ultimate position was expressed in "The Core Content of Family Medicine," published in 1966. This defined family medicine in terms of the physician-patient relationship and conceptualized the notion of comprehensive, continuing care of both individuals and families. This also emphasized the counseling role of the family physician and his/her responsibilities in continuing care. It recognized the sociological and community-wide implications of the practice of family medicine.

In effect, the discipline was redefined. The general practitioner became the family physician, the discipline became that of family medicine, which was delivered in the environment of family practice. The redefinition put into words the intuitively accepted responsibilities and overall orientation of the generalist, but, as yet, there was no documentation available to support the concepts expressed — only opinion.

Unscientific on this score and questioned by other disciplines, gaining entry into the medical school's curriculum was difficult. Yet societal needs were so great that, in spite of these deficiencies, a new discipline of family

medicine and practice was reluctantly accepted by the medical establishment and began to gain entry into medical schools in the late 1960s and early 1970s. This was something which general practice as a discipline had generally failed to do in the past.

The first need of this new discipline was an educational capability. New educators from the community had to learn to teach from experience, to develop new teaching environments and methods, and to integrate themselves, as educators, into the medical educational establishment. Successes and failures still continue, but now, seven years later, what was adequate in the beginning will no longer suffice. As educational expertise has developed and exposure to younger, unfettered, critical, and curious minds has increased, the lack of documented data from family practice has become painfully obvious.

This awareness developed gradually; the initial educational thrust of the discipline was directed toward the hospital, but later it was realized that the focus of the universe of primary medicine lay in the office or practice and its interfaces with both hospital and community. It was recognized that the content of family medicine was not clearly defined even in the thoughts of its practitioners and that little or no documentation existed to support any thesis. The first need was a descriptive one: a means, a methodology, for the collection and organization of information about the universe of family medicine. This might not be classed as research by everyone, but it was an essential first step, necessarily preceding the analysis of such data which, all would agree, is research.

All new hospital-based disciplines have gone through this stage of description, and it has been termed in other contexts as the "development of a data base." Family medicine had greater difficulties than other disciplines because its environment or function was often outside the hospital. This required new approaches to the problem of data collection in the office, where data collection instruments and methodologies were not common. Hospital data collection methods were not applicable.

New and different types of information are required to deliver truly holistic care. The individual patient is seen in the whole context of living —

as a person; as a member of a family and a community; at home, at work, and at leisure. This requires the physician to have knowledge of individuals, families, and populations. Information at all these levels will be pertinent and essential in providing appropriate care. Trends and patterns of behavior, morbidity, and social change in large populations will highlight and focus on similar but more discreet changes in the local community or practice population, sensitizing the family physician to his/her preventive role.

The local-level awareness of these changes requires the establishment of a baseline or norm for a particular community or practice against which to measure changes. The descriptive phase of data collection and organization of information in each practice will provide that base, and as the descriptive tools improve, more and better data will result in a clear and more detailed description which, with analysis, will provide better (ie, more specific and experimental) research.

The search for this new knowledge is driven by a basic need. The educator in family medicine is required to develop a curriculum which is specific to the discipline for family practice graduate, postgraduate, and continuing education. The unique concepts to be presented must be supported by data. A curriculum is never definitive; like society, medicine which is a part of society must be dynamic. It must include a leading edge undergoing continuous change, which is responsive to technological improvements, changes in societal values and attitudes, changes in the relationships between patient, physician, law and government, and the needs and demands of members of the discipline and the population it serves. Family medicine is no different, but it is at a disadvantage vis-a-vis other disciplines in medicine in not having this data base. Yet it is also an advantage in that the discipline can begin with no preconceived position in the educational hierarchy, as it has only a position in the "real world." Success in service, education, and research will come from applying what family practice knows and does and from expanding and applying the ever-increasing new knowledge.

This requires a research capability which must come from the community situation. Perhaps we should now ask the question, "What is re-

search in the family practice sense?" The term still produces an image of a white-coated, bench-bound physician that induces many negative connotations for the problem-solving, decision-making clinician reveling in the cut and thrust of community practice. The former is only one type of research; observing, recording, and analyzing personal or practice experience over a continuum must be considered another type. It qualifies by extending the horizons of knowledge for the individual observer, and doubly so if the data are presented in such a way as to allow comparisons with like situations. The hallmark of research is the representation and applicability of the results to other environments, expanding the body of knowledge available.

Perhaps it is too much to expect every practice to be a research practice, every practicing family physician to be capable of "organized curiosity"; but every practice can measure, collect, and retrieve data. If the physician is unwilling or unable to analyze the data, then he/she can make it available to others more willing or able. The provider will always be the initiator of research efforts; curiosity about his/her own working environment will raise questions for which he/she will seek answers. If the family physician does not have the information to answer the questions, he/she can seek ways (ie, instruments and methodologies) to secure this information. He/she can go through the problem-defining, problem-solving, decision-making sequence that is carried out in practice life, applying it, not to an individual patient or family, but to his or her population. This will make the office or practice a laboratory in the community, a major site for the use of scientific method in individual, family, and community care.

The family physician provider has an advantage over his/her other specialist colleagues. He or she sees, side by side with the abnormal, a spectrum of normality in multiple contexts. His/her decisions are based in, tried and tested in, and their validity measured in the context of normality. This gives the family physician, uniquely among the medical specialties, the opportunity to observe and record the natural history of illness and health as it exists in communities. Alone among the specialties, the fam-

ily physician sees the whole of a disease, presented in an unselected way, which can be followed under critical, continuing observation. Unasked and unanswered questions abound in family practice. Observation, recording, analysis, reflection, and discussion among peers are the basic tools. They must be used and will eventually serve as referent points for research that uses experimental design methodologies.

In an attempt to show how far the discipline has come in a few short years in meeting these requirements, this report is presented; it reviews the research efforts of the following three university programs of family medicine:

(1) the Family Medicine Program of the University of Rochester, New York, (2) the Department of Family and Community Medicine of the University of Utah at Salt Lake City, Utah, and (3) the Department of Family Medicine, University of Western Ontario, London, Ontario.

These programs are among the leading ones in the discipline and are recognized as outstanding in the field. It is hoped that what is reported here will provide inspiration and direction to all involved in this endeavor.

Methods

The challenge of a report such as this is to find a way in which to express adequately the research effort of each program, a way in which the overall picture will be visible enough to allow the differences and similarities to be seen by the reader. It will be impossible to report minutely on every effort, but it will be possible to highlight selected papers by paraphrase or synopsis which, it is hoped, will illustrate the major trends of work of each program.

There are papers — published, in press, in progress, and unpublished — which express philosophical opinion or describe educational or service projects. Consideration of these is, perhaps, beyond the remit of the authors

and, in developing this bibliography, only papers which either: (1) develop a hypothesis or question, collect data, and analyze it; or (2) present, describe, or validate data collection, retrieval, or analytical methodologies have been included. In each case, work should have been carried out in the general area of primary health care.

In pursuit of what is hoped to be clarity, research efforts have been divided into five areas. The first three are patient oriented. The last two areas are organizationally oriented.

1. Patient Care Research — Included here will be work concerned with diagnosis, disease management, and therapeutics, and the interface with other specialties and subspecialties. Also, work will be included which deals with the natural presentation of disease in the office and in the community as well as work which deals with the whole area of patient education.

2. Epidemiological and Environmental Research — This will include work concerned with health and disease in cohorts of patients and cohorts of families defined by demography, morbidity, geography, and environment. Also, work will be included which is concerned with the incidence and prevalence of health and disease in communities and populations, including the patient populations served at primary care practice sites.

3. Behavioral and Social Research — Here will be included those papers concerned with behavioral and social manifestations of disease in individual patients, families, communities, and patient groups of all types; the problems of communication between patients and health-care providers and among providers themselves; the behavioral and social patterns of providers of health care and among these providers at the individual and group (team) levels; and, the patterns of relationships among providers of various types and backgrounds, both with each other and with patients at various patient care sites.

4. Operational and Managerial Research — This area consists of papers concerned with providers of all types in office and hospital practice, the rates of hospital admission and referral, and the evaluation of health-care delivery systems of various types. Papers on the development, use, and evaluation of recording and retrieval

methodologies in the primary care practice environment will also be included.

5. Educational Research — Here will be included papers which are concerned with the measurement and evaluation of training programs for all types of providers of primary care: for example, physicians at both undergraduate and graduate levels in addition to mid-level providers of care — nurses, nurse practitioners, physicians' assistants, Medex, etc. Also, those papers will be included which present and evaluate methods of auditing the process of training these providers of care, the appropriateness of their edu-

cational environment, and the evaluation of the records used in that process.

This material will be presented sequentially for each of the three departments, beginning with the University of Rochester, followed by the University of Utah, and concluding with the University of Western Ontario. For each department, an overview will first be presented, including a general description of the program, setting, resources, and organization. The research effort in five major areas will then be summarized, including brief summaries of the content of selected papers. Following the three depart-

mental reports, the research efforts of each department will be compared, and finally, future directions of research in family medicine will be discussed. A complete listing of papers representing original work in each department will conclude this research report. This bibliography will include published, in press, in progress, and unpublished papers, which will be designated by an asterisk when based on research done on family practice patient populations in a Family Practice Center or similar community practice environment serving patients of all ages, both sexes, and all sociodemographic variables.

University of Rochester

Introduction and Overview

The University of Rochester Family Medicine Program began as a division of the University of Rochester in the Departments of Internal Medicine, Pediatrics, and Community Health at Highland Hospital in Rochester in 1967. It was one of the earliest family medicine programs in the United States and from the outset was directed by a practicing family physician. In 1974 the Program became one of the three components of a primary care program of the University of Rochester. These elements were family medicine, primary-care internal medicine, and primary-care pediatrics.

Originally, space was provided by Highland Hospital to develop a free-standing Family Practice Center, and this freedom of action has been responsible for much of the continued success of the Program. In late 1975 the Family Practice Center was moved to larger premises outside the Highland Hospital campus, but the Program has maintained its relationship as a department within the hospital.

Within the Program, the administrative structure is simple. There is an executive committee composed of full-time faculty, the two chief residents, and a resident representative from each of the three years. The commit-

tee is chaired by the Director of the Program and all basic policy decisions are made by that group. The committee meetings are open to anyone involved in the Program, all of whom may attend and participate.

The Program is divided into administrative units, each of which is directed by a full-time faculty member. These units consist of:

The Director of the Program

The Director of Graduate Medical Education and the Residency Program

The Director of Undergraduate Education

The Director of Research

The Medical Director

The Administrative Developer

The Executive Committee meets every month, and each of the responsible faculty members makes a report to the Executive Committee on all matters in his or her area of concern. In this way, there is regular communication among all elements of the Program, including the opportunity for discussion of problems of integration of effort.

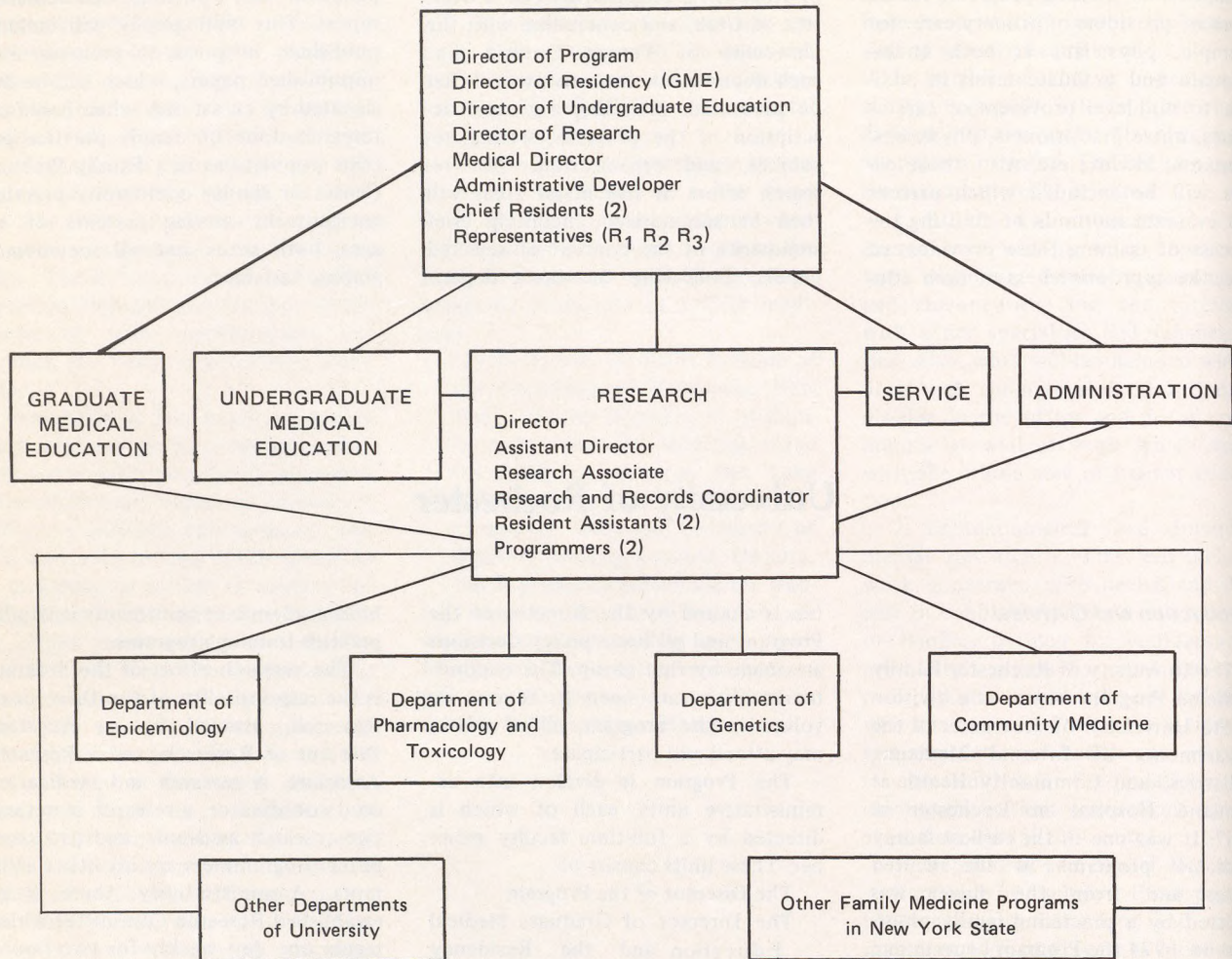
The number of residents in the Program has varied over the years and is currently 12 per year. There are presently 36 residents in the Program. To date, there have been 49 graduates, approximately 50 percent of whom

hold academic appointments in family practice training programs.

The research effort of the Program is the responsibility of the Director of Research, assisted by an Assistant Director of Research, and a Research Associate. A research and medical record coordinator, a research secretary, two research assistants, and two computer programmers are his other assistants. Administratively, there is an established Research Committee which meets one day weekly for two hours. Its membership consists of the individuals listed above and liaison persons representing the Director of the Residency Program, the Director of Undergraduate Education, the Medical Director, and the Administrative Developer. Routinely, there is a liaison person from the University's Department of Preventive Medicine and Community Health and, occasionally, from the Department of Genetics and the Department of Pharmacology and Toxicology. The meeting is chaired by the Director of Research and is open to community physicians to attend as they wish. This will generally occur when they are seeking information and resource from the faculty members of the Family Medicine Program. The meeting agendas are prepared in advance and are concerned with project critique and project planning. Re-

Figure 1
University of Rochester
Organizational Structure of the Family Medicine Program

EXECUTIVE COMMITTEE



search administrative matters are taken up at the end of the meeting; the programmers and research staff usually are only involved in that part of the proceedings.

The Committee works with other departments of the university and interacts with other programs in family medicine at various meetings in New York State. The Director of Research generally represents the Program and the Committee on these occasions, which occur about three to four times

per year (Figure 1).

In addition to their roles in the Committee, the Director and Assistant Director of Research and the Research Associate act as research resources to individual researchers at the faculty, staff, resident, and undergraduate levels. They provide consultation and counseling at the early stages of project planning, but major research effort at the individual level would require discussion of the full Committee.

The Committee has no ongoing relationship with the Department of Biostatistics of the University of Rochester, but individual members of that Department have acted as resources for the Research Committee on occasions.

There are long-standing relationships, going back to 1972, with practicing physicians in the community. All primary care disciplines are represented, namely pediatricians, internists, and family physicians. These

associations were based on data collection in the community practices. Many of these relationships are still extant and will undergo further development in the near future.

Through its Research Committee, the Family Medicine Program has many responsibilities outside the Family Practice Center. It is deeply involved with other agencies of the New York State government and with other family medicine programs in New York and other parts of the United States.

The funding of the Family Medicine Program comes from five major sources: (1) federal grant, (2) hospital funds for part of each resident's and faculty member's salary, (3) fee-for-service income, (4) support from the state of New York, based on an agreement made with residents prior to graduation to practice in New York for two years, and (5) University support and other. The "other" category is composed of foundational grants and other contracts for research training and education.

Over the past three years the total budget has varied between \$1 million and \$1.3 million from all sources. This amount is obtained from among the five major sources as follows: (1) federal grant support, which has been approximately 45 percent, (2) and (3) hospital and fee-for-service income, 40 percent, (4) State support, averaging approximately ten percent, and (5) University support, which has been consistently less than one percent (\$1,500 per year). Research activity has been supported through several grants at four percent of the total budget.

Patient Care Research

Three papers can be classified in this area.¹⁻³ Each will be briefly summarized.

One study evaluated the physician's management of a tracer illness in the family practice environment.¹ It presents the methodology and results of a study to assess "quality of care" by measuring the management of hypertension in a family practice. The author states that this tracer technique, when based only on one disease, cannot be a measure of the general quality of care delivered. Other tracer diseases are necessary to provide a more complete picture of the health-care delivery system. The technique

holds promise as a quality assessment method in view of the minimum requirements of time, money, and resources, and its self-teaching and self-evaluating capability.

A second study is a cooperative effort between the Departments of Pharmacology and Toxicology and Medicine with the University of Rochester.² It is a comprehensive study of the prescriptions written by 50 family physicians in four separate health-care facilities in the city of Rochester. It analyzes the first 1,000 prescriptions and relates the drug prescribed to the morbidity identified.

A third paper discusses the need and possibility of enlisting primary care physicians to record morbidity data on a continuous basis in order to obtain health statistics required to assess health-care needs and evaluate health-care delivery systems.³ Physicians' costs and benefits are discussed, and some of the obtained data are illustrated.

Epidemiological and Environmental Research

In this area, five studies were completed and prepared for publication between the year 1967 and the present.⁴⁻⁸ Three of these will be briefly summarized. As with the University of Western Ontario, the major concern of the researchers in this Program in the last few years has been to develop the instruments and methodologies necessary to establish a research environment in the Family Practice Center.

One study by the Rochester Family Medicine Program reveals that outreach by primary care physicians, based on analyses of patient population needs through data systems identifying patients by age, sex, diagnosis, and area of residence, can significantly contribute to improved national health.⁴

In a second study, a lead-screening program conducted by the Rochester Family Medicine Training Program on 333 children, it was found that socioeconomic status correlated well with evidence of undue lead absorption. Screening of children residing in lower socioeconomic census tracts was suggested. Results are described in detail.⁷

A third paper presents data from a survey on the prevalence of the most frequently diagnosed chronic diseases in children who were patients of pri-

mary care physicians involved in the morbidity study. Results of the study and various aspects of the primary care physicians' participation in treating these cases are discussed.⁸

Behavioral and Social Research

Only a limited amount of research work⁹ was undertaken in this area, between the year 1967 and the present. Until just recently, the Program has had minimal human resources in this field.

Operational and Managerial Research

In this area, between the year 1967 and the present, some 19 papers were prepared for publication,¹⁰⁻²⁸ many of which have focused on methodology for research. It has been assumed that when methods for data organization in practice are used correctly and taught successfully, they can improve medical care, utilization of medical care resources, and medical education. Computers can be brought into and used in medical care at the appropriate level, at a reasonable cost, and with the involvement of many more physicians.

One study reports the work of a New York State medical group which designed and began to use a computer-generated medical recording and health-care data system for state correctional facilities.²¹ Resulting information should be beneficial in planning improvements in health services delivered to institutionalized populations.

A second study presents a model for assessment of quality of care in the ambulatory setting by diagnostic profiles (including an age/sex register, disease classification, and diagnostically grouped morbidity data) of participating physicians.²³ Participation by physicians is indicated, due in part to the benefit they receive and the system's validity in evaluating quality of care.

The feasibility of a change to problem-oriented records in a 21-year-old solo primary practice is evaluated in a third paper.²⁴ A critical review of patients' problems was produced, and it was also revealed that with a modest expenditure of time, a change to problem-oriented records can be accomplished.

Educational Research

Five papers were prepared for pub-

lication in this area, between the year 1970 and the present.²⁹⁻³³ As with the University of Western Ontario, the first priority was to establish the educational environment, and the next to develop an appropriate curriculum for

family medicine. These tasks have overwhelmed other educational research efforts.

One paper reports a study conducted by the University of Rochester Family Medicine Training Program of

the health problems encountered by family physicians in multiple settings.³³ The morbidity data were used to develop a core curriculum to relate training of the residents to the realities of health-care delivery.

University of Utah

Introduction and Overview

The Department of Family and Community Medicine at the University of Utah at Salt Lake City is one of 16 departments in the Medical Center. It began in July 1970, which makes it one of the youngest departments in the Medical Center. Within the Department there are six Divisions: Family Practice, Community Medicine, Behavioral Science, Biostatistics, Epidemiology, and Environmental and Occupational Health. Each Division Head relates to the Chairman of the Department, who has directed the Department since its inception.

The Department is run by an Executive Committee which is chaired by the Departmental Chairman; the other members are the Chairmen of the Divisions of Community Medicine, Behavioral Science, and Biostatistics. Two other members are also appointed to this committee. The Executive Committee meets weekly, establishes policy, and makes major decisions affecting the Department as a whole.

Each Division meets on a weekly basis with the chairing Division Head, and there are bimonthly faculty meetings. Other regular meetings are held between project staffs and other special interest groups.

The Division of Family Practice is presently without a Chairman, and the Departmental Chairman is filling this role. Each division head is responsible for the performance, effort, and function of his division within the agreed upon goals and objectives of the Department. He cooperates and interacts as necessary and agreed upon with the other divisions and also with other departments within the Medical Center.

The funding of the Department comes from three major sources: (1) support from the Legislative Assembly of the state of Utah, (2) University support from the Dean's office of the Medical School, and (3) other support.

The latter is mainly from state, federal, and foundational grants and contracts for research training and education. There are also several individual industrial contracts, and some salary support for faculty and residents from associated hospitals.

Over the past three years the total budget has varied between \$2.2 and \$2.75 million per year. This amount has been obtained from among the three major sources as follows: (1) State support, varying between 6.2 percent and 12.9 percent of the total funding, (2) University support, varying between 3.5 percent and 8.8 percent of the total, and (3) other support, varying between 83 percent and 85 percent of the total funding.

The Department occupies over 9,000 square feet in the University Medical Center and one of the outlying buildings. Current plans call for expansion of the University Medical Center in 1981, and the Department has been allotted approximately 25,000 square feet in this expanded new facility.

At the time of writing, there are 32 full-time faculty members, 16 MDs, and 16 PhDs. Two MDs have shared appointments with pediatrics and psychiatry, and one PhD has a shared appointment with psychiatry. There are 109 clinical faculty and some 75 staff members.

In the Division of Family Practice there is essentially one resident training program with two components: (1) in Ogden, about 40 miles north of Salt Lake City, at McKay-Dee Hospital and (2) in Salt Lake City, the experience being shared among Holy Cross Hospital, the University Hospital, and Children's Hospital.

At this time there are 39 residents: 20 at Ogden and 19 at Salt Lake City. Within family practice, under the direction of the Chairman of the Department, there is a Medex Training Program, now in its seventh year. It is

essentially autonomous and uses central faculty only as resource. This Program is 100 percent federally funded, there is an annual intake of 17 students, and the course lasts 12 months. The first five months consist of didactic training at the University Medical Center and the last seven months are a preceptorship with a matched physician in the community. Ninety-four percent of these Utah preceptors are family physicians.

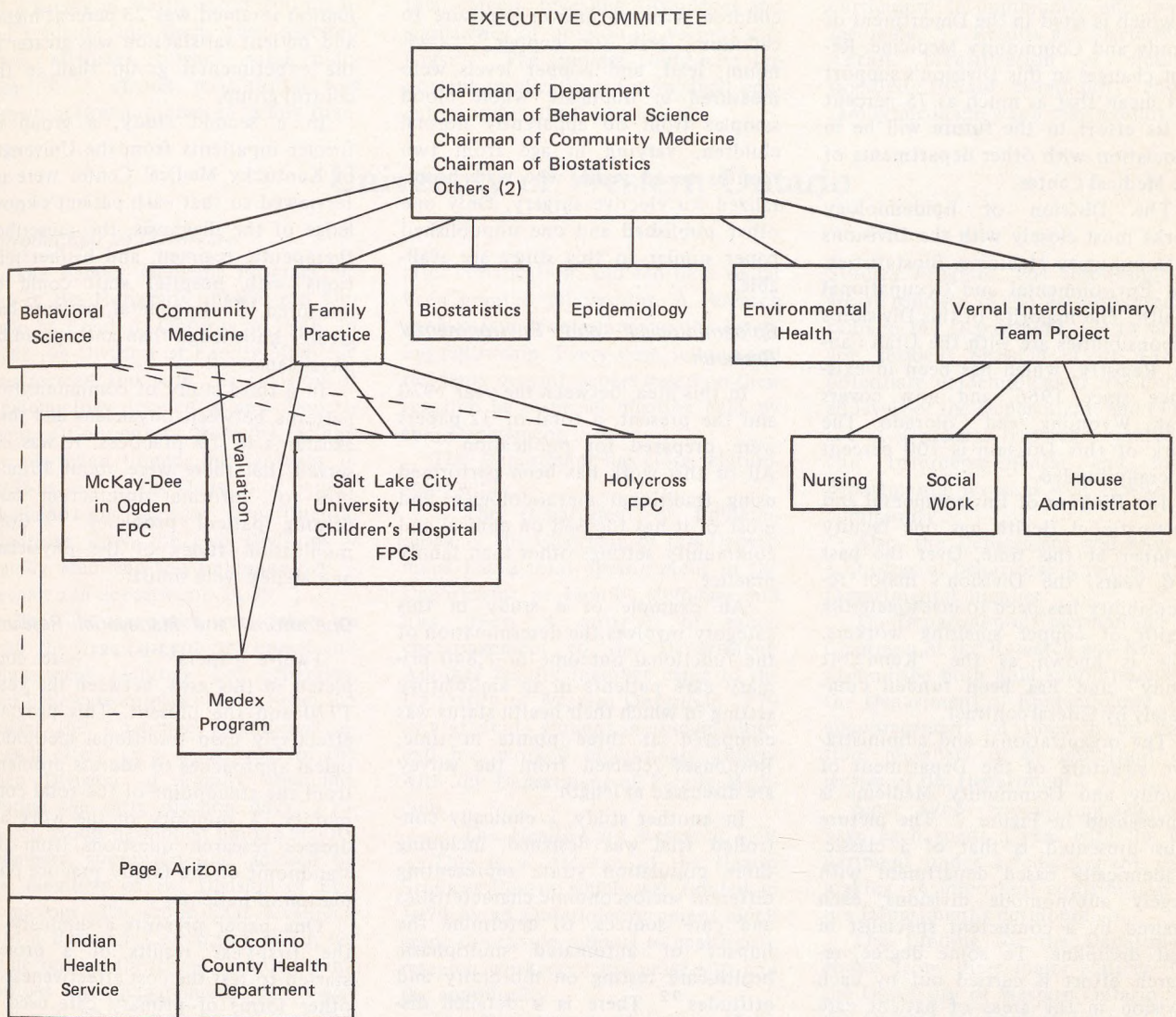
The Division of Community Medicine has three residents, one of whom is represented in both family practice and community medicine during a joint four-year residency. Also, the Division offers a Master of Science course in community medicine; there are currently 12 students in this course.

For the last three years the Division has been responsible for the implementation and development of an ambulatory care delivery system in Page, Arizona. The Indian Health Service and Coconino County Health Department cooperate in this endeavor, the health care being provided by a physician-nurse practitioner-administrator team. Ongoing data collection and analysis of the system are the responsibility of the Division of Community Medicine.

Since mid-1974, evaluation of the Medex Training Program has been conducted by the Division of Community Medicine. This is a major effort and monitors each practice employing a Medex at three points in time: (1) pre-Medex period, (2) training period, while the Medex is being trained by a preceptor, and (3) employment period, when the Medex is working as a full member of the practice. The evaluation includes measures of patient volume, practice finance, and quality of care delivered.

In early 1975 an interdisciplinary committee of the University of Utah was organized to develop a rural pri-

Figure 2
University of Utah
Organizational Structure of the Department of Family and Community Medicine



mary care group practice in Vernal, which is about 175 miles east of Salt Lake City. This committee was composed of representatives from nursing, social work, the Departments of Family and Community Medicine and Health Education. Funding was secured in mid-1975, and since then a team consisting of two physicians, a nurse practitioner, a social worker, and a clinical pharmacist has been established and is now working towards economic stability. This facility will be used for family practice training and, since the completion of an anthropological-ethnographic survey

of the community in September 1975, will provide an excellent research base for the future.

The research effort of the Division of Community Medicine is enormous, using other divisions of the Department as resources when appropriate. However, it has its own statistical resources and is largely self-sufficient in that area.

The Division of Behavioral Sciences works most closely with the Division of Family Practice within the Department, but also has links with other departments within the Medical Center. During the last two years, much of

its work has been at Ogden and Salt Lake City Family Practice Centers where it has been concerned with increasing resident awareness, psychosocial skills, and communication capability.

The Division of Biostatistics controls the computer resources for the Department and for the entire Medical Center. Until the time of this writing, 60 to 70 percent of its effort has been manifest within the Department, mostly with the Divisions of Epidemiology and Environmental and Occupational Health. There has been little involvement with the Division of Fam-

ily Practice, and the Division of Behavioral Science as yet has had few research demands of the quantitative kind. The Division's computer resource consists of a Univac 1108, which has three remote terminals, none of which is sited in the Department of Family and Community Medicine. Recent changes in this Division's support will mean that as much as 75 percent of its effort in the future will be in association with other departments of the Medical Center.

The Division of Epidemiology works most closely with the Divisions of Community Medicine, Biostatistics, and Environmental and Occupational Health. The majority of this Division's responsibilities are with the Utah Cancer Registry, which has been in existence since 1966, and now covers Utah, Wyoming, and Colorado. The work of this Division is 100 percent federally funded.

The Division of Environmental and Occupational Health has one faculty member at this time. Over the past two years, the Division's major responsibility has been to investigate the health of copper smelting workers. This is known as the "Kendicott Study" and has been funded completely by federal contract.

The organizational and administrative structure of the Department of Family and Community Medicine is represented in Figure 2. The picture thus presented is that of a classic, academically based department with largely autonomous divisions, each chaired by a competent specialist in that discipline. To some degree, research effort is carried out by each division in the areas of patient care and education.

Patient Care Research

Since 1970, some 32 papers on research in patient care have been produced by past and present members of the Department of Family and Community Medicine.³⁴⁻⁶⁵ These studies were made on patient populations in variable facilities: clinics, outpatient departments, and hospital-based departments.

One paper discloses the results of a survey of patients identified through Workmen's Compensation records who were treated by a chiropractor or physician for back or spinal problems.⁴² Both types of treatment seemed to be equally effective in

restoring function and providing satisfaction as seen through patient's perceptions of improvement.

The object of a second study was to measure the normal levels of cadmium and copper in a population of well children with no known exposure to cadmium, lead, or copper.⁵⁷ Cadmium, lead, and copper levels were measured in duplicate whole blood samples from 60 apparently normal children, varying in age from two months to 13 years, who were hospitalized for elective surgery. Only one other published and one unpublished paper similar to this study are available.

Epidemiological and Environmental Research

In this area, between the year 1970 and the present, a total of 32 papers were prepared for publication.⁶⁶⁻⁹⁷ All of this work has been performed using traditional methodologies, and most of it has focused on clinical and community settings other than family practice.

An example of a study in this category involves the determination of the functional outcome of 1,840 primary care patients in an ambulatory setting in which their health status was compared at three points in time. Responses received from the survey are discussed at length.⁶⁶

In another study, a clinically controlled trial was designed, including three population strata representing different socioeconomic characteristics and care sources, to determine the impact of automated multiphasic health-care testing on morbidity and attitudes.⁹² There is a detailed discussion of the results.

Behavioral and Social Research

Between the year 1970 and the present, 16 papers were prepared in this area for publication.⁹⁸⁻¹¹³ The presence of an established Division of Behavioral Science in this Department has had a profound effect on the research output in this area. The family practice office is seen by this Division as a unique environment for this type of research.

One study,⁹⁸ performed by a medical student in the Family Practice Center of the University of Utah, showed that patients are more satisfied with physicians when they are given — and are able to retain — more informa-

tion about their illnesses. The method used an experimental group of patients who were asked to repeat the information they had been given by their physician. This response was fed back to the physician for his/her use. Information retained was 23 percent higher and patient satisfaction was greater in the experimental group than in the control group.

In a second study, a group of former inpatients from the University of Kentucky Medical Center were interviewed so that each patient's knowledge of the diagnosis, the prescribed therapeutic regimen, and his/her relations with hospital staff could be measured.¹⁰⁵ In general, patients had greater knowledge than anticipated by physicians.

In a third study of communication patterns between physicians and their assistants in 19 practices, it was observed that there were about 30 minutes of informal interaction concerning patient problems.¹⁰⁶ Communication styles of the physicians and Medex were similar.

Operational and Managerial Research

Twelve papers¹¹⁴⁻¹²⁵ were completed in this area, between the years 1970 and the present. This program effectively used traditional methodological approaches to address problems from the standpoint of the total community. A minority of the work addresses research questions from the standpoint of the family practice population of patients.

One paper presents a summary of the first-year results of a project started to test the cost effectiveness of other forms of primary care used in nursing homes, such as care delivered by nurse practitioners and social workers.¹¹⁵ Results include changes in drug regimens, record keeping, and care provided by nursing home staffs.

Another study discusses problems faced by nursing homes and the authors' attempts to solve them, including a specially designed problem-oriented record. Deficiencies were disclosed, and remedies demonstrated.¹¹⁸ The cost was offset by reduced hospitalization and related medical costs.

Educational Research

In this area, between the year 1970 and the present, 17 papers were completed.¹²⁶⁻¹⁴² Initial research effort was largely with medical and Medex

students. Recently, this Program, too, has begun research in the Family Practice Center educational environment.

One paper summarizes the results of a survey in which about 200 medical students and their wives assessed their attitudes toward rural practice.¹³⁴ A strong relationship was shown between interest in family prac-

tice and plans for rural practice.

Another study compares attitude changes among Medex with those of medical students by measuring variables at roughly comparable points in their careers, revealing differences and similarities of opinion on various subjects.¹³⁵ The findings could have important implications for medical educators and medical education.

Another paper reports the attitudes of two cohorts of medical students measured at two points in time in order to estimate the acceptance and importance of an elective freshman curriculum in community and family medicine.¹³⁶ Results are discussed in detail. Identification of students oriented toward community and/or family medicine was a major result.

University of Western Ontario

Introduction and Overview

The Family Medicine Program began in the University of Western Ontario at London, Ontario in 1966. In 1968 the Division of Family Medicine was formed and with the Division of Epidemiology formed a new Department of Community Medicine. A family physician joined the Division in 1968 as head of the Division of Family Medicine and became Departmental Chairman when the two Divisions — Family Medicine and Epidemiology — became full departments in 1972.

The first few years were taken up with the development of clinical and educational facilities and programs, and little research was done. From the outset the Chairman established research effort as a major goal of the then Division of Family Medicine. During the early division days, a research group developed among faculty members, supported and advised by the members of the Division of Epidemiology. The group later developed into a Research Committee which became one of the three standing committees when departmental status was achieved. There are now 14 professional full-time equivalents in the Department (Figure 3).

The standing committee on Research and Records, along with its working party, is responsible to the Departmental Committee for the review and critique of all research proposals and for initiating and supervising research and records' projects.

Each Family Practice Center has a full-time director and between three and five full-time faculty members. Each full-time faculty member heads a teaching practice team and is responsible for training two residents from each year of the two-year Program. The Program takes in 24 new residents every year. Graduates of the Program may apply for a teaching fellowship

after certification, and ten have so far been granted fellowships. A research project is a requirement of the teaching fellowship. Every year, fellows and residents present papers based on their research at a special meeting held by the Department.

The Department has close relationships with:

1. The Department of Epidemiology — The Chairman of this Department has a joint appointment in the Department of Family Medicine and has been a source of much encouragement to the Department. Another faculty member came to the University of Western Ontario in 1970 as a graduate student in epidemiology and has worked increasingly closely with the Department of Family Medicine.

2. The Health-Care Research Unit — This is a resource of the Health Sciences Centre which was funded in 1974 by an Ontario government block grant to provide support to health-care research workers in the university and the community.

The Departments of Family Medicine from the five Ontario medical schools have formed an Interdepartmental Research and Records Group (IRRG). This Group has developed a standardized terminology for research in the five Departments and has acted as medium for the exchange of ideas and information on research and information systems.

At the Departmental level in the medical school, the Chairman is supported by a national health research scholar funded by the Canadian federal government to spend 75 percent of his time in research. He is a member and Chairman-designate of the Research and Records Committee and recently has been appointed Director of the Department's new Graduate

Studies Program. His responsibilities are as follows: (1) to develop research skills in the Department, (2) to supervise resident research effort, (3) to potentiate epidemiological research at all levels of the Department, and (4) to act as a general research resource at the interdepartmental and intra-departmental levels as well as with the community.

Also, the Department will soon be acquiring a behavioral scientist as a Departmental member.

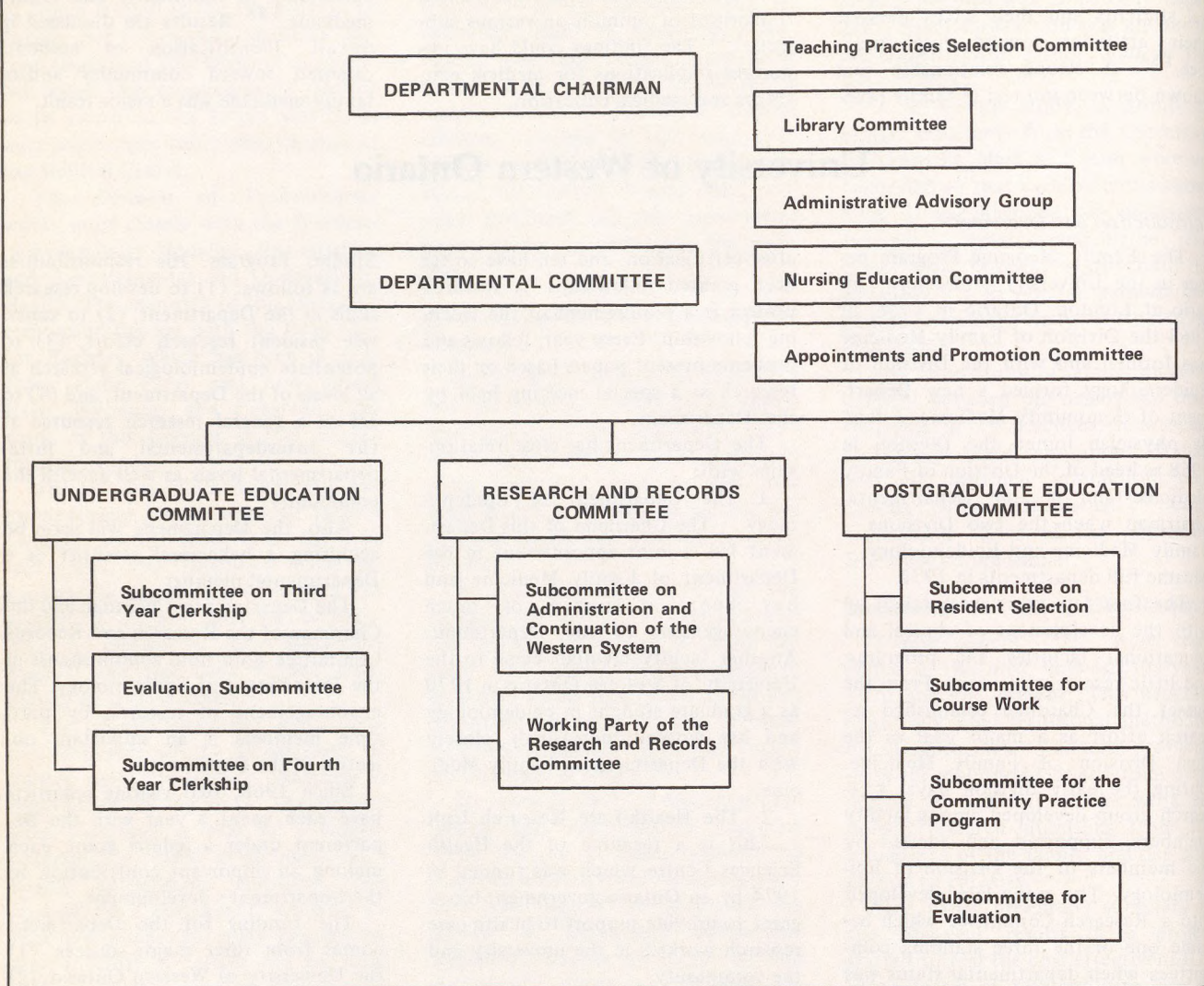
The Departmental Chairman and the Chairman of the Research and Records Committee both hold appointments in the Department of Epidemiology. The encouragement of research by part-time members is an important objective of the Department.

Since 1968, two visiting scientists have each spent a year with the Department under a federal grant, each making an important contribution to the Department's development.

The funding for the Department comes from three major sources: (1) the University of Western Ontario, (2) the Ontario Ministry of Health Grant for Community Practice, and (3) other sources, including funds from a federal government grant for support of a national health research scholar, and foundational grants for research.

Over the past three years a total budget of \$600,125 has been obtained from three major sources as follows: (1) University support, \$399,125 (67 percent), (2) Ontario Ministry of Health, \$175,000 (29 percent), and (3) other sources (federal grants, etc) \$26,000 (4 percent). The Department's research efforts have been funded primarily by grants from the Ontario Ministry of Health, the Canadian Department of National Health and Welfare, and Physicians' Services Incorporated.

Figure 3
University of Western Ontario
Organizational Structure of the Department of Family Medicine



Patient Care Research

Clinical research in family medicine at the University of Western Ontario has been facilitated by the development of the information systems described in the section on operational research. Areas of particular interest have been the natural history of common conditions seen in family practice and the manner in which family physicians respond to their patients' needs. Research in these areas has been pursued by residents and teaching fellows, as well as by faculty members.

It is the policy of the Department that all research protocols be reviewed by the Research and Records Committee. This system allows appropriate expert criticism at the optimal stage in

the evolution of the project. All are agreed that this is a valuable learning experience and enhances the likelihood of successful completion of the work.

Most work in this area has been research in the context of the Family Practice Center and is ambulatory in orientation.¹⁴³⁻¹⁵⁴

One study reported the rate of urinary symptoms over a period of one year in three teaching practices, with a total registered population of 4,368 patients.¹⁴³ The physicians' responses are described and the predictive value of urinary symptoms in the diagnosis of urinary tract infection is discussed.

Another paper reports the results of a survey which was undertaken to

discover the primary health-care role of the pharmacist in London, Ontario.¹⁴⁴ It is concerned with the problems with which the pharmacist deals and the advice he/she gives. The contribution of the pharmacist to primary health care was found to be substantial.

A third study in progress is a research project of one of the teaching fellows in the Department of Family Medicine. It consists of a retrospective study of all patients presenting with the symptom of fatigue over a 12-month period at three Family Practice Centers.¹⁴⁸ It required the review of between 200 and 250 clinical charts, and it related this presenting symptom to outcome in terms of

hemoglobin estimations. Also, the author makes some observations about physician behavior in providing a diagnosis for presenting symptoms (critique). This paper was presented at the Department of Family Medicine's Residents' Day in 1976.

A major study of the natural history of symptoms in family practice is in the planning stage. A pilot study has been completed to investigate problems of data collection, coding, and linkage.

Epidemiological and Environmental Research

In this area, between the year 1966 and the present, six papers have been completed.¹⁵⁵⁻¹⁶⁰ Several papers deal with the methodological problems of data collection and analysis in the Family Practice Center.

One paper discusses the necessity of comparability of morbidity studies from family practice and the different methods which can be used to reduce the variability of the denominator.¹⁵⁵ The most satisfactory denominator is the population at risk.

Another study discusses the methodology and results of a research project on how best to assess patient satisfaction, by comparing patient responses on three measures: (1) a direct measure about the patient's personal doctor, (2) an intermediate measure, and (3) an indirect measure about doctors in general.¹⁵⁹ The results reveal that general and personal responses were quite different, with the intermediate measure appearing to be most valid because it evoked responses more closely associated with patient's recovery and care received.

A third study assesses physicians' knowledge of patients' problems and relates this to measures of patient recovery and satisfaction.¹⁶⁰ Two hundred ninety-nine patients with specific chronic illnesses were interviewed at several points in time. The results of the study are presented from the standpoints of the patient, the physician, and the researcher.

Behavioral and Social Research

In this area, between the year 1966 and the present, four papers were published.¹⁶¹⁻¹⁶⁴ Much of this early effort was at the conceptual level.

A paper by McWhinney represents a landmark in the conceptualization of the primary physician's need for clas-

sifying social and behavioral factors in clinical care of patients.¹⁶¹ The point of contact between physician and patient is used as the basis for the classification of patient behavior. In the taxonomy of social factors in illness, the interactions between patients and their environment are divided into seven categories. The integration of these two classifications with problem classifications already in use in clinical medicine potentiates the delivery of holistic care to patients.

Another study compared two groups of physicians (nine family physicians and nine consulting internists) who were presented with three clinical problems by a programmed "patient."¹⁶² The number and type of questions asked varied, but there were no major differences in the final diagnosis.

The subject of a third paper is the doctor/patient relationship of 299 chronically ill patients as reflected in the physicians' knowledge of the patients' problems: psychological, social, and physical.¹⁶⁴ Several recommendations of use to physicians in increasing their knowledge of the patients are made on the basis of the findings.

Operational and Managerial Research

In this area, between the year 1966 and the present, a total of 18 papers were completed.¹⁶⁵⁻¹⁸² The lack of appropriate methodology for research in the family practice office, in the early years, is shown by the attention paid to this area. It reflects the need to establish a data base for family medicine and an awareness that traditional methods used in and by medical institutions could not fulfill that need.

One report describes in detail a data retrieval system which combines the registration of practice populations with the indexing of chronic problems affecting each patient and with the ready retrievability of important demographic and health data.¹⁶⁷ The high degree of accuracy, efficiency, and simplicity of the system have been demonstrated.

In another paper, the medical care needs and problems of newcomers to the London, Ontario area and the effectiveness of a physician-locating service in London, Ontario, are examined.¹⁶⁹ Through results of a survey, newcomers' medical care patterns and physician-locating service problems are emphasized.

Educational Research

In this area, between the year 1966 and the present, seven papers were completed.¹⁸³⁻¹⁸⁹ Graduate training of residents in Family Practice Centers represents a new educational environment beginning in the late 1960s. Most of the early years were spent in establishing the Centers. Only recently has an educational research effort become possible.

One study examines the results of a survey in which 50 patients of a particular teaching practice completed questionnaires in an attempt to discover patients' attitudes about the care they had received.¹⁸³ Perceived benefits seemingly outweighed the disadvantages.

Profiles of Research Effort by Program

Table 1 shows a measure of the research effort of each of the three programs. The output of all three is prodigious and seems to be roughly in proportion to the number of individuals — residents and faculty — in each Department.

Most of the research product in each Department seems to be the result of individual or small group effort. The time span over which this product was developed is roughly the same, most of the work having been produced since 1970.

The difficulties and time-consuming demands of behavioral and social research are epitomized by the comparative paucity of work in this area. This may be a reflection of the lack of precision of the taxonomy and classification systems in these areas and the general fuzziness of the concepts being evaluated. Part of the problem lies in the multifaceted nature of the behavioral and social arena. This was succinctly paraphrased by a member of the Behavioral Science Division of the University of Utah, who stated that during his two years of research in an interpersonal communication training program for physicians, he had come to expect, and be satisfied with, small gains.

The three programs vary in numbers of faculty and residents. The Family Medicine Program at the University of Rochester employs the smallest number of faculty and residents, and has only one Family Practice Teaching Center. The Department of

Table 1. Types of Research by Program

		Patient Care Research	Epidemiological/ Environmental Research	Behavioral/ Social Research	Operational/ Managerial Research	Educational Research
Rochester	In Family Practice	3	5	1	17	5
	In Other Areas	0	0	0	2	0
University of Utah	In Family Practice	0	4	2	3	2
	In Other Areas	32	28	14	9	15
Western Ontario	In Family Practice	11	4	4	15	7
	In Other Areas	1	2	0	3	0

Family Medicine at the University of Western Ontario is next in size and has three Family Practice Teaching Centers available to it. The largest of the three Departments is the Department of Family and Community Medicine of the University of Utah, which has three Family Practice Teaching Centers available and two Research Centers in the community. In the two smaller Departments, it is obvious that most of their work in all areas has been carried out in the Family Practice Teaching Center or in community practices with which they have a formal association. Their research effort was concentrated largely in the area of practice organization and management, and scrutiny of the papers produced shows that the work is concerned with the creation of instruments and methodologies to define and describe the demand in the family practice environment.

This concentration, in what might be considered a rather sterile area of research, is perhaps a manifestation of the vital need to understand better what is happening in the family practice office in the community. This information is thought to be essential in allowing the family practice educators both to develop appropriate curricula for family practice residency training and to teach the elements of these curricula from an intellectual rather than an intuitive standpoint.

Because the majority of the faculty in the two smaller programs had come to teaching from years of practice in

their offices in the community, the natural direction of their interests would be to the environment they knew best, the family practice office. Without a career in academia behind them, without the conforming demand of the classical academic model of investigation, and with a pragmatism and empiricism rooted in the problem-solving environment of community practice, their initial approach was to begin by measuring the "what is."

A further indication of this is shown earlier in this report in the distribution of the funding in the three Departments. The proportion of resource from state, medical school, and foundational federal funding shows some significant differences. Little federal and foundational money has been available for research in community practice situations until recently, and research effort has been most easily applied in controlled environments, such as hospitals, clinics, nursing homes, or other situations where a readily defined patient population was available.

In examining the work of the Department of Family and Community Medicine of the University of Utah, the increasing concentration of the Department's research effort in community practice is welcomed. The research rigor, expertise, and academic excellence shown by this Program, which in the early years was spread over the whole of community medicine, is now being directed towards

community practice situations in Vernal, Ogden, Salt Lake City, and the offices of resident graduates of the Department. This concentration is appropriate. The new epidemiology of practice populations, highlighting the surprising similarity in the measured demand by populations of similar age and sex distribution in various cultures, means that primary health-care needs can be better identified. With this may come definitions of the most cost-effective environment for the delivery of personal, holistic, family and community-oriented primary and secondary care.

Future Directions

Had this paper been written in problem-oriented form, this section would have been designated as the plan, and in correct problem-oriented style, would have contained the three elements of further investigation, therapy, and education.

All these elements are appropriate here and provide structure for the comments to follow. The authors assume the privilege of forecasting the future direction in research from their detailed examination of these three successful and extremely productive programs, and presume to offer this forecast as a suggested route for the discipline of family medicine to follow. Naturally this represents the opinions of the authors, neither more nor less than that.

The rate of change in family medicine is occurring faster than ever.

Family practice has always been the most dynamic area of medicine. Because of its interface with the community it is the discipline in the profession of medicine which first feels the impact of societal change, and because of its close association and contact with members of the community it is the discipline in which performance and responsibilities are most affected by technological improvement in the profession as a whole.

Classifications

Problem-definition and problem-solving in family medicine, as in other disciplines, depend on the probabilities existing in the environment in which that discipline is practiced. This is particularly true of family medicine and most definitions in family medicine are based on symptom complexes. Classical epidemiology is concerned with the incidence and prevalence of diseases organized in logical classifications determined by the needs of the user. Originally these classifications were used only by pathologists and were structured in terms of mortality, that is, "causes of death." During the last 30 years, there has been an increase, fed by the rapid increase in specialization, in the rate of classifications of morbidity, that is, "causes of sickness." Classifications became more and more detailed as information on rare and esoteric diseases increased. During this same period, primary care classification needs were moving in the opposite direction towards broader groupings to reduce the data recording demand in the high frequency, shorter contacts typical of a community practice environment.

Such classifications were developed by various family practice organizations in the western world and have been the basis for the descriptions of the core knowledge in family practice, that is, the new epidemiology of primary care populations. As in the other specialties, this core knowledge requires investigation in depth and detail, and future classifications in family medicine will be concerned both with the details of preventing disease in the community and with the symptoms or the patients' complaints.

These symptoms, complaints, and reasons for visit, when classified, will allow information recorded in primary care practices to be related to our

current classifications of morbidity and will provide new insights into the natural history of disease presenting in the noninstitutional world. These new insights will be of significant importance in developing new and better methods of preventive care and care of the chronic, long-term disabling diseases.

There is an enormous amount of work to be done in this area. It has been said that no description of disease is so complete that it would not benefit from some new addition. This is unusually true in the field of primary care. As long ago as 1921, McKenzie,* and, in 1967, Bain and Spaulding,† pointed out the link between symptoms and diagnostic probability. More recently, the work of the National Ambulatory Medical Care Survey‡ has taken a major step forward in achieving this.

Most of our current descriptions of disease are based on observations in the controlled environment of the hospital. Family medicine, with an orientation to a comprehensive continuing care, has both a unique responsibility and a unique opportunity to observe the presenting symptomatology in patient populations. Methods of identifying and defining the patient population at risk are necessary so that individuals and families can be observed over time. If this capability was routinely established in family practice, not only would continuing, preventively oriented, health-care management be possible, but each practice would represent a controlled environment in which a scientific investigation both retrospective and prospective could be carried out. Such instruments do exist and papers illustrating them have been published by both the University of Western Ontario and the University of Rochester.

Definitions

Review of the published and unpublished work done in all areas by

*McKenzie, Sir James: *Symptoms and Their Interpretation* (ed 4). New York, Paul B. Hoeber, Inc., 1921.

†Bain ST, Spaulding WB: *The Importance of Coding Presenting Symptoms*. *Can Med Assoc J* 97:953, 1967.

‡National Ambulatory Medical Care Survey: *Symptom Classification: Methodology for classifying patients' symptoms, complaints, problems, and reasons for seeking ambulatory medical care*. *Vital and Health Statistics, Series 2, No. 63*. US Department of Health, Education, and Welfare Pub. No. (HRA) 74-1337, 1974.

these three programs indicates a wide range of criteria concerning definitions of terms and procedures. A beginning has been made in bringing order to the chaos through the development of the International Classification of Health Problems in Primary Care (ICHPPC) and the beginning of a symptom classification in the National Ambulatory Medical Care Survey (NAMCS), but precise definition of the terms used in presenting this information about family and community practice is still lacking. Such simple elements as patient, provider, visit, problem, diagnosis, out-of-hours' call, etc, are still without agreed-upon and universally accepted definitions.

It will probably be impossible ever to reach agreed-upon criteria for the definition of diagnostic labels used in a classification of morbidity for family medicine but this, we contend, is not serious. The major need for specificity in this area will be in prospective studies, and very precise criteria of definition can be established prior to the beginning of a study. This will allow — if necessary or appropriate — comparability with later work.

Training

There is a considerable lack of human resource with experience and training in research design in family medicine. The capacity to undergo the discipline of observation, recording, and analysis, the development of a research question, the establishment of hypotheses, the review of literature, and the designing of research protocols can all be taught. Few of us are born with this capability; the best no doubt are, but the way of the majority must be training by association with experienced researchers, added to an intellectual curiosity about what is happening in the practice environment.

University programs in family medicine such as Western Ontario, Rochester, and Utah have a responsibility to the discipline to train both practicing and future family physicians in research methods and skills, particularly those necessary for personal and individual use in the practice. It is obvious that, in the future, a major research effort must come from the practicing physician — not only from the educationally modified Family Practice Centers in the university programs. As Farley in a personal com-

munication in 1976 has said, every practice should be a research practice; the best research comes from the curious individual working in his/her own practice environment, observing his/her community of patients and families over a continuum, and responding to their needs in both sickness and health. The knowledge of the norms of his/her practice helps the physician-researcher to identify the unusual, and curiosity leads him/her to seek explanations. Such physicians were Osler and McKenzie, and more recently Pickles of Aysgarth in England; while we may not all be able to emulate them, we can at least attempt to follow their footsteps.

If we postulate that these three programs represent the best of research in family medicine in North America at this time, it would seem appropriate to postulate what future research directions may be indicated by what has been done and not done in each of the areas of Patient Care Research, Epidemiological and Environmental Research, Behavioral Science Research, Practice Organization and Management Research, and Educational Research.

Each of these areas will now be addressed in turn in an attempt to synthesize from "where we are" to where we should go in the future.

Patient Care Research

This area, in fact, embraces all the other areas except perhaps that of Education. So only those types of research which cannot be considered under the other headings will be considered here.

In all three programs one significant omission in the work that is being done is the investigation and evaluation of the process of "diagnosis" in the family practice arena. There is a need for answers to such questions as, "Are the criteria used for such and such a diagnosis in a hospital environment appropriate for use in the office?" "If these criteria are in use, what is the consistency and completeness of their use?" "If certain criteria are not used in the office context, why are they not used, and are they necessary?" "Can the diagnosis be established without them?"

After the diagnosis has been made, there is a need for answers to such questions as "What are the criteria of management in the family practice

environment?" "How does the family physician's management differ from that provided in the hospital?" "What are the outcomes of this management compared to the outcomes of similar cases managed solely in the hospital?" "What outcome measures are appropriate to use?" "Should we restrict them to provider-developed outcomes or should we include patient outcomes, such as hard measures of return to plateaus of normality, elapsed time before return to the same or an equivalent job, and elapsed time before return to a plateau of activity similar to that enjoyed prior to the disease process?" "Do we include measures of the cost effectiveness of the care?" "How do we measure cost effectiveness?" "Do we include length of stay in the hospital as a measure?"

Such studies of the cost effectiveness of care for similar problems with similar outcomes, with and without periods of hospitalization, will be the data on which financial decisions to support ambulatory care programs will be made in the future.

In fact, if family medicine concerns itself with the cost effectiveness of care and relates the care delivered to patient outcomes as a method of evaluating the care delivered, then it may be possible to show that in many common and highly significant conditions, hospital care is neither appropriate nor efficient. Recovery rates may be shorter when the patient is retained in the home environment, and there is little doubt that the care of chronic disabling disease and long-term disability is best carried out with the patient living and perhaps working from his/her home base.

Investigation is required into the benefits or disadvantages of treating the family as a unit and managing the problems of individual members of the family by using the family structure as a resource. Further, can the use of this type of relationship among physician, patient, and family develop and embellish an orientation to a disease-preventive course of activity by individual members of the family?

If the end result of our new educational processes is to produce a physician who better serves his/her patients, then it behooves academically oriented educational programs to demand of their faculty research effort which can produce answers to questions such as those presented above.

Epidemiological and Environmental Research

Previous consideration has been directed to the new epidemiology of practice populations and the capacity to develop a controlled environment in the community by identifying the denominator of patients at risk to a particular provider or group of providers. The epidemiology of a particular group of families known personally and individually to the doctors involved in caring for them brings a new dimension to the science of epidemiology.

With the development of efficient instruments for measuring the demand for care over a continuum and for identifying the demographic characteristics of the patient populations at risk, and with the use of new insights which have been developed concerning the definition of denominators, each practice can become a field of research activity through collaboration and association with physicians and groups of physicians with similar interests. Then, large-scale epidemiological and environmental studies can be mounted. One of the major deficiencies in classical epidemiology is its lack of capacity to mount long-term, controlled comparative studies of the effects of environmental differences—both natural and unnatural—in the morbidity presented by defined groups of individuals. Community-based family practice offices possessing this proven recording capability represent an invaluable resource for such studies. Such resources are becoming increasingly vital for the continued good health of our population in view of the almost geometric increase in cases of industrial chemical insults to our environment.

Behavioral Science Research

In this area, much basic developmental work is yet to be done. To date, adequate instruments such as classifications and glossaries of terms and definitions have not yet been produced. This has made it extremely difficult to compare the work being done by different researchers in different periods. This research is prodigal in its use of time, fiscal, and human resources, and as human resources particularly are in considerably short supply within the discipline of family medicine, it is obvious why in the two smaller programs there is a

comparative paucity of effort in these areas. Family medicine is, undoubtedly, at the frontiers of knowledge in these areas, and behavioralists have recognized the family practice office as a unique environment for research in individual and group behavior and its relationship to morbidity and mortality.

Here again, studies which involve the continued observation of individuals and families over the long term are possible, as well as the capacity to observe matched controls.

Much work needs to be done in the areas of communication — among physicians themselves, between physicians and other providers, and between physicians and their patients — as a way of determining the best method of conveying the most appropriate amount of information to the patient. Measures of compliance and data on the most beneficial methods of improving compliance are required. Research into what motivates patients to comply is involved here, and this has really only been touched upon within the family practice office environment.

Acting as listener and counselor, with a data base acquired as a result of associations with so many people over the years, the family physician is well equipped to deal with the vast majority of behavioral problems which beset humanity.

Practice Organization and Management Research

As stated previously, this area has seen the first thrust of effort by the two smaller programs, a thrust fueled by the need to define the "as is" to enable the production and development of appropriate curricula for family practice teaching. While this phase is not over, and in fact there will be a continuing need for long-term data-recording to allow a regular review and update of those curricula for family medicine education, the urgency is now less, and perhaps we shall see in the future less effort in these areas.

This is not to say that we have now reached the ultimate in practice organization or in management techniques. The opposite is true. There is much developmental work to be done and much assessment to be undertaken if we are to improve continuously and demonstrate the cost effectiveness of the health care we deliver, the art,

skills, and techniques of delegation, and the usefulness or disadvantages of the team approach to health care. As new providers of health care develop and as the styles of team performance change, so will there be a continuing need for evaluative studies to show us the best routes to take.

A major part of practice organization and management in the future will be the appropriate use of informational machines, and with the increasing sophistication of a new generation of dedicated computers, the ways in which these instruments can be used to develop and expand outreach capability for the physicians must be identified. The increasing orientation to preventive medicine will require identification of high-risk groups and some degree of monitoring of their health status over time. Without informational machines, such efforts will be impossible, and we look forward to seeing research effort in this area.

Such instruments have obvious uses in the field of billing and would allow the comparison of unique methods of funding health care; it is even possible that both aspects of the use of dedicated computers could be investigated at one time.

Educational Research

This fifth area represents considerable opportunity and, of course, challenge. Family medicine is fortunate in that it alone among the specialties came into being with no pre-established curriculum, with no established institution for educational purposes, and with few entrenched attitudes in its educators. This enabled family medicine to begin with a clean slate and to apply basic educational principles, assess the newest educational techniques and methodologies, and apply them to its own discipline. This has been done almost universally but with varying degrees of success, and much of the educational research has been concerned with developing evaluational methodologies. Also, because the office teaching environment was new and extremely small when compared with other educational institutions, there has been room to experiment with one-to-one and small-group teaching techniques.

Heretofore, few patient care institutions have had such close personal relationships with their patients as do

family physicians, and research and investigation into the best methods of educating and influencing patients will provide a fertile field of investigation in the coming years.

The Family Practice Center is a unique educational institution. It holds promise of being the most effective medical educational institution ever developed. Those family physicians with a bent for education will, it is hoped, concentrate on this one area, which provides unlimited potential for innovation, experimentation, investigation, and research.

Summary

This investigation into three leading programs has led us to believe that at this still very early stage of development, only seven years after reaching specialty status, family medicine is still in its late childhood. However, the early influences were good, excellent habits were established, and the discipline is now about to embark on a journey through a highly active adolescence. Our concerns lie in the fact that while we have chosen three programs, they perhaps represent the very best. We are unsure how many of the long established programs can match the performance of these three and even more unsure of the proportion of newer programs which have even attempted to address the research needs in this same way. It behooves everyone in family medicine to measure the performance of his or her program in this essential area against all that has been presented here and to resolve individually to do everything possible to share in the truly enormous task of rewriting the natural history of health and illness as it presents in all communities.

This is a responsibility owed to the whole profession of medicine. No other discipline can do this and, indeed, the continued survival of family medicine as the major primary care discipline taught as an integral part of the pre and post-MD curriculum will depend on the scholarly activity carried out in the family medicine programs.

The most important and effective component of this scholarly activity will be research and investigation into the unique aspects of family medicine as it is practiced in the office and as it interfaces with the community and the hospital.

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*Indicates research work done with family practice patient populations in a Family Practice Center or similar community practice environment serving patients of all ages, both sexes, and all sociodemographic variables.

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