A Study of Family Practice in Wisconsin

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Studies of family practice in Wisconsin and elsewhere show that the clinical content of family practice has about 20 to 45 patient contacts per day and about two to six diagnoses per patient contact. Seventy-five percent of patient contacts are in the office and on the telephone, 15 to 20 percent in the hospital, and 5 to 10 percent elsewhere.

There is a broad array of patient problems. Special Conditions and Examinations Without Illness contain the largest number of patient problems. About 60 percent of patients are female and present more endocrine and genitourinary problems. Men present more trauma, circulatory, and respiratory problems, and less health maintenance care.

Well-baby and well-child examinations stop at age 15 years. Pre and postnatal care decline sharply at age 35 years, at which time surgical care increases. Infectious disease and trauma, ranking high in the young, are low in the elderly. Circulatory problems, obesity, diabetes, and arthritis increase greatly with age.

There is no major difference in type of patient problems related to town size (ie, population). However, comparative studies may uncover different disease occurrence rates between regions.

Family practice has developed as a discipline in recent years. Because its content is not limited by age, academic, or organ system distinctions, research is necessarily attempting to define and describe its disciplinary scope.

The research published to date describing the nature of family practice includes studies from five states—Vermont,[1] New York,[2] Massachusetts,[3] Colorado,[4] most recently Virginia[5]—and the National Disease and Therapeutic Index[6] general practice profile. While the specific focus of each of these research efforts has varied, the general purpose was the same: to identify the epidemiology of patient care problems and to identify practice characteristics and patterns which describe family practice.

That each of these studies took place in a different geographical area is fortuitous. Among the issues research must address to improve understanding of family practice is whether a description of family practice can be applied across state and regional boundaries. Specifically, are there practice characteristics and patient care problems that are uniform across different areas or locales? Are there practice differences that can be traced to demographic and geographic differences?

Selected Wisconsin family physicians have studied their practices with the help of the Department of Continuing Medical Education of the

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Table 1. Family Practices and Patient Contacts by Population of Town

Population of Town	Number of Family Practices	Percentage of all Patient Contacts
	(N=100)	(N=17,416)
0-2,500	25	27
2,500-4,999	26	21
5,000-9,999	20	24
10,000-49,999	15	17
50,000-plus	14	11

University of Wisconsin Medical School. The data collected from these physicians were analyzed with the above questions in mind, and were compared with practice data from other regions of the United States. Such comparisons will contribute to a better understanding of the nature of family practice and of the needs of family physicians.

Method

Detailed descriptions of family practice were obtained by studying 100 Wisconsin family practices over a three-year period through Individual Physician Profile (IPP), a three-step process reported previously.[7]

IPP is aimed at helping family physicians identify their individual educational needs. In the first step, data are collected from the physician about every patient contact (a contact is defined as any interaction between physician and patient requiring the physician's medical judgment) for one different day a week for four weeks. A pocket-size tape recorder is lent to the physician for this purpose. The patient problems indicated by the physician are coded into the Eighth Revision International Classification of Diseases, Adapted (ICDA)[8] and these data are then computerized. The computer generates a practice profile and a test, the second step of IPP.

The examination is drawn from a test bank of 2,800 questions which are coded into the ICDA at the Department of Continuing Medical Education of the University of Wisconsin Medical School. The distribution of questions is determined by the individual's practice profile.

In the last step of IPP, the participant and a physician-educational consultant review the materials from steps 1 and 2 by phone. Recommendations for continuing education are the end result.[9,10]

The data collected from 100 Wisconsin family physicians (1970 to 1973) were analyzed from two vantage points: practice characteristics and epidemiology of patient problems. Three variables included in the analysis, which related specifically to practice, were the population of the town the physician served, the type of practice in which the physician was engaged, and the place where the patient contacts occurred. The epidemiological data of patient problems were analyzed in terms of patient age, sex, and the population of the town.

Data Analysis

Practice Characteristics

The 100 self-enrolled physicians were located in towns ranging in population from less than 2,500 to over 50,000 (Table 1). During the sampling period, these 100 family physicians had 17,416 patient contacts (average 43.5 per day), and reported a total of 28,803 diagnoses, averaging 1.7 diagnoses per patient contact.

The distribution by type or location of patient contacts included 61.7 percent in physician offices, 20 percent in hospitals, and 14.9 percent by telephone. The remaining 3.3 percent were divided among hospital Emergency Rooms (1.5 percent), nursing homes (0.3 percent), and house calls (0.8 percent).

The physicians participating in this study were described using five practice types: 22 were in solo practices, 35 were in single specialty practices with five or fewer physicians, and 8 were in single specialty practices with more than five physicians. The remaining 35 physicians practiced in *multispecialty* groups, 13 of these in groups with five or fewer physicians, 22 in groups with more than five physicians.

Epidemiological Data

Figure 1 presents the total percentage distributions of the 28,803 recorded diagnoses among the 18 ICDA general categories and by patient sex.

Special Conditions and Examinations Without Illness (Category 18 in the ICDA rubric, which includes prenatal and postnatal care, surgery, and postoperative care) accounted for the largest single percentage of total diagnoses (19.6 percent). Diagnoses related to the circulatory system (Category 7) and to the respiratory system (Category 8)

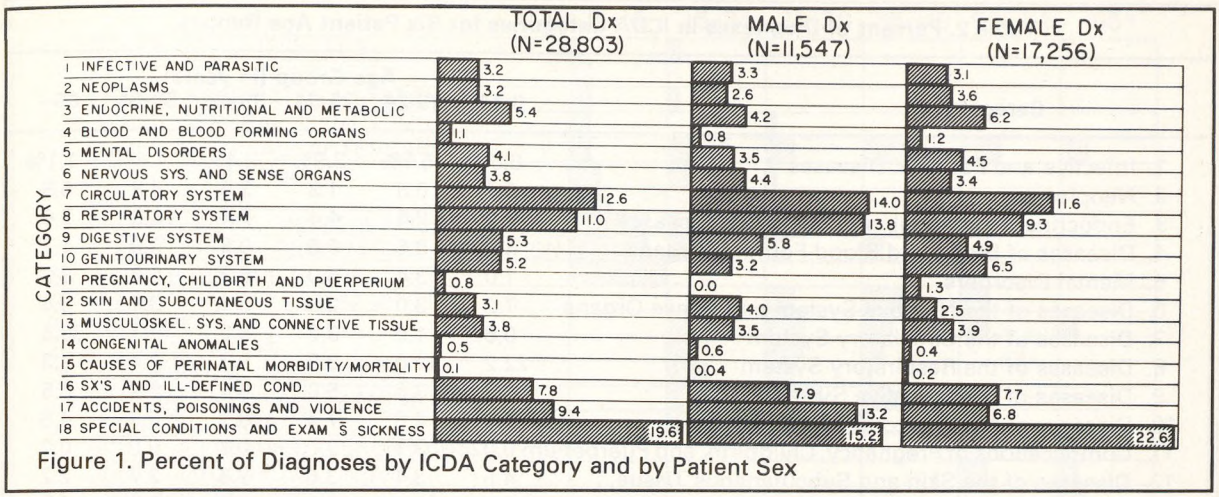

Figure 1. Percent of Diagnoses by ICDA Category and by Patient Sex

comprised the next largest categories of diagnoses (12.6 percent and 11.0 percent, respectively).

Women comprised 59.5 percent of all patient contacts and presented 59.9 percent of the diagnoses. They had more endocrine and genitourinary-related diagnoses than the male patients, as well as more diagnoses in the Special Conditions and Examinations Without Illness category. A greater proportion of the diagnoses made for male patients was circulatory and respiratory related. In addition, male patients accounted for the greater percentage of diagnoses made in Category 17, Accidents, Poisonings, and Violence.

The diagnoses recorded in the 18 general categories of the ICDA were analyzed according to six patient age groups (Table 2), which ranged from infant and pediatric (0 to 14 years) to geriatric (65 years and over).

Several patterns in diagnoses emerged as a result of these analyses. Diagnoses relating to Infective and Parasitic Diseases (Category 1), to Diseases of the Respiratory System (Category 8), to Accidents, Poisonings, and Violence (Category 17), and to Special Conditions and Examinations Without Illness (Category 18) were recorded with greater frequency for younger patients, especially those in the 0 to 14 and 15 to 24 year age groups. The percentage of diagnoses in these categories decreased steadily as the age of patients increased.

Diagnoses of Diseases of the Circulatory System (Category 7) showed a marked increase with patient age, so that almost one third of the diagnoses for patients over 50 years were related to the circulatory system. This trend was also evident, to a lesser degree, in the diagnoses relating to Diseases of the Digestive System (Category 9) and to Diseases of the Musculoskeletal System and Connective Tissue (Category 13).

The relationship of diagnosis to patient age is further demonstrated by comparing the ten specific diagnoses occurring most frequently for each age group (Figure 2). For all six age groups, the ten most frequently occurring specific problems accounted for a large portion of all diagnoses recorded for that age group. The range was from 28 percent of all diagnoses in the 35 to 49 year age group to 47 percent of all problems in the 0 to 14 year age group.

The most frequently occurring specific diagnoses recorded in the 0 to 14 year age group concerned well-baby and well-child care (14 percent), acute upper respiratory tract infections (8 percent), and prophylactic inoculations and vaccinations (8 percent). In both the 15 to 24 and 25 to 34 year age groups, prenatal care and general medical examinations occurred most frequently.

The most frequently occurring specific diagnoses in the 35 to 49 year age group were surgery and surgical aftercare (5 percent), general medical examination (5 percent) and obesity (4 percent). For the 50 to 64 year age group, surgery and surgical aftercare continued to be one of the more frequently occurring diagnoses (4 percent), while diabetes increased to four percent of the total diagnoses made in this age range. Specific diagnoses relating to the circulatory system also began to occur with greater frequency in this group.

In the 65 years and over age group, the specific circulatory diagnoses increased in frequency to

Table 2. Percent of Diagnoses in ICDA Categories for Six Patient Age Ranges

Category	Age Group (in years) 0-14	15-24	25-34	35-49	50-64	65+
1. Infective and Parasitic Diseases	6.6%	5.1%	3.9%	2.4%	1.4%	1.1%
2. Neoplasms	0.4	0.8	1.3	3.5	5.8	5.5
3. Endocrine, Nutritional, and Metabolic Diseases	0.9	2.4	4.4	7.4	8.6	7.6
4. Diseases of Blood and Blood-Forming Organs	1.0	0.6	0.5	0.8	0.9	1.7
5. Mental Disorders	1.0	3.4	6.0	6.3	5.3	3.9
6. Diseases of the Nervous System and Sense Organs	7.2	3.0	2.5	3.1	3.1	3.4
7. Diseases of the Circulatory System	0.6	1.0	3.2	8.2	18.7	30.5
8. Diseases of the Respiratory System	22.2	11.0	8.8	9.3	7.4	7.3
9. Diseases of the Digestive System	3.2	3.6	5.0	6.2	6.7	6.5
10. Diseases of the Genitourinary System	1.5	4.6	7.4	8.2	6.3	4.6
11. Complications of Pregnancy, Childbirth, and Puerperium	0.02	3.1	2.0	0.7	0.0	0.0
12. Diseases of the Skin and Subcutaneous Tissue	4.5	3.4	3.6	2.6	2.7	2.2
13. Diseases of the Musculoskeletal System and Connective Tissue	0.8	1.3	2.2	4.3	6.2	6.3
14. Congenital Anomalies	1.6	0.4	0.4	0.3	0.2	0.2
15. Certain Causes of Perinatal Morbidity and Mortality	0.7	0.07	0.0	0.07	0.0	0.0
16. Symptoms and Ill-defined Conditions	8.7	7.5	8.2	8.1	8.2	6.8
17. Accidents, Poisonings, and Violence	12.0	13.0	10.0	10.1	6.9	5.5
18. Special Conditions and Examinations Without Illness	27.0	35.5	30.6	18.4	11.6	6.9

comprise 23 percent of all diagnoses. Chronic ischemic heart disease increased from three percent in the 50 to 64 year age group to seven percent for patients 65 years and over, while symptomatic heart disease increased from one to four percent. Acute ill-defined cerebrovascular disease and arteriosclerosis make their appearance among the major specific diagnoses in the 65 years and over age group.

The distribution of diagnoses across the 18 categories, when analyzed by town population, did not deviate markedly from the distribution of total diagnoses described in Figure 1. In every town size group, the percentage of diagnoses in Special Conditions and Examinations Without Illness (Category 18) far exceeded any other single category. Furthermore, the percentages of circulatory and respiratory-related illnesses were also considerably larger than those of the remaining categories. Circulatory-related illnesses comprised a larger percentage of the diagnoses made in the less populated towns, while respiratory-related illnesses constituted a larger portion of the diagnoses made in towns with larger populations.

Discussion

The 43.5 average number of patient contacts per day for Wisconsin family physicians compared to 21.1 reported in Massachusetts and 21.6 described in the National Disease and Therapeutic Index. These averages point out the range in number of patient contacts per day among physicians in different areas. Such comparisons, however, must take into account the differing types of patient contacts recorded. For example, failure to record patient contacts by telephone could significantly reduce the total number.

For Wisconsin physicians, 61.7 percent of patient contacts were in the office, 20 percent in the hospital, 14.9 percent by telephone, and 3.3 percent were divided among the hospital Emergency Room, nursing home, and patient's home. In the New York study, 77 percent of patient contacts were in the office, 14.5 percent in the hospital, 4 percent in the patient's home, and 4.5 percent in other areas; 56.6 percent of physicians received more than ten telephone calls each day. In the Massachusetts study, 71.6 percent of patient contacts were in the office, 21.6 percent in the hospital, 5.6 percent in the patient's home, and 1.2 percent elsewhere. The National Disease and Therapeutic Index data indicate that 86 percent of patient contacts were in the office, home, or on the telephone, and 14 percent in the hospital. These data reaffirm that about 75 percent of patient contacts for family or general practice physicians

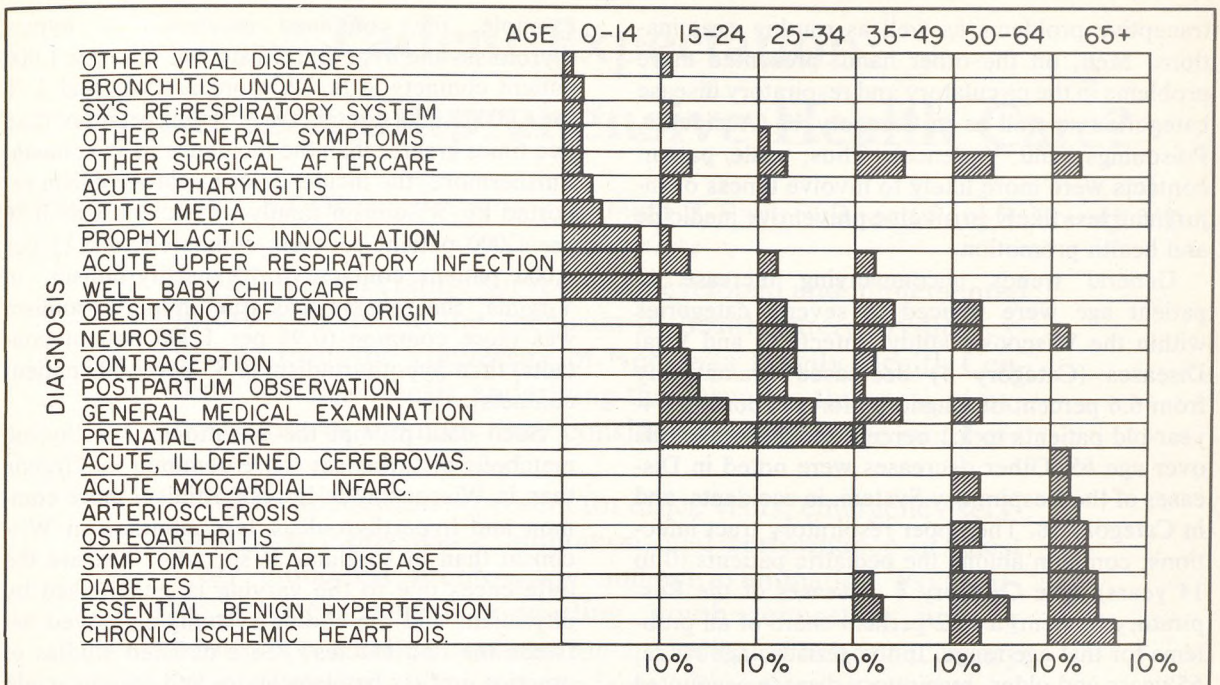

Figure 2. Most Frequent Diagnoses by Percent and Age

occur in the office and on the telephone.

The 1.7 diagnoses per patient contact for Wisconsin family physicians compared to 5.9 reported in the Virginia study. Why the number of diagnoses per patient was more than three times greater in Virginia than in Wisconsin is not clear, but might be related to the physician sample. Nearly 70 percent of the physicians in the Virginia study were residents in training for family practice where use of the problem-oriented medical record and formation of a complete patient problem list is emphasized. The Wisconsin family physicians were long-established private practitioners who had never been trained to use the problem-oriented medical record.

Among the 100 Wisconsin practices studied, Special Conditions and Examinations Without Illness, arbitrarily called Category 18, even without surgery, was consistently the largest category with diagnoses for which patients sought primary care. This was also true in the Massachusetts, Virginia, and Colorado studies. While patient problems under Category 18 ranked very high, they did not rank first in the studies of family practice in Vermont, the National Disease and Therapeutic Index, and the National Ambulatory Medical Care Survey.[11] (The failure of patient encounters for non-illness to rank first in these last three studies may be explained by differences in coding systems.) The top ranking of some other category usually signaled an atypical family practice among the Wisconsin participants in IPP. Examples of atypical practices were physicians who had, and in effect, emphasized psychosomatic, rheumatologic, surgical, or some other specialized area in their practices.

When examined more closely, Category 18 decreased in ranking with increasing age of the patient population in Wisconsin. However, within the category certain specific diagnoses increased while others decreased. Well-baby and well-child examinations disappeared at age 15 years or so, being replaced by general medical examinations. Prenatal and postnatal care decreased sharply at about age 35. Lastly, the subcategory which included surgery and postoperative care increased at about age 35 years.

The breakdown of patient contacts by patient sex (59.5 percent female) for these Wisconsin physicians agreed closely with the above-mentioned studies which varied from 58 percent females in Vermont to 60.8 percent females in Virginia. Women in the Wisconsin study presented more obstetrical, gynecological, and con-

traceptive problems as well as routine examinations. Men, on the other hand, presented more problems in the circulatory and respiratory disease categories as well as in Category 17 (Accidents, Poisonings, and Violence). Thus, male patient contacts were more likely to involve illness or injury and less likely to involve preventive medicine and health promotion.

General trends accompanying increase in patient age were noticed in several categories within the Wisconsin study. Infectious and Viral Diseases (Category 1) decreased dramatically from 6.6 percent of diagnoses for newborn to 14-year-old patients to 1.1 percent for those patients over age 65. Other decreases were noted in Diseases of the Respiratory System, in accidents, and in Category 18. The upper respiratory tract infections, common among the pediatric patients (0 to 14 years) gave Category 8 (Diseases of the Respiratory System) a 22.2 percent share of all problems for that age range. In the geriatric age range, 65 years and older, respiratory disease accounted for 7.3 percent of all medical problems. The percentage of problems associated with Accidents, Poisonings, and Violence decreased from 12 percent of patient problems for 0 to 14-years-old to 10 percent for the 35 to 49 year age range, and then more suddenly by nearly half, to 5.5 percent for the age group 65 years and older.

Increases in frequency of diagnoses with patient age were most noticeable in circulatory diseases, endocrine and nutritional diseases, and diseases of the musculoskeletal system. The incidence of obesity increased with patient age and was paralleled by diabetes; together they accounted for the greater part of the increase in endocrine-related diagnoses. Osteoarthritis was the single most important medical problem accounting for the increase in disease of the musculoskeletal system (from 0.8 percent in the 0 to 14 year age range, to 2.2 percent in the 25 to 34 year age range, to 6.3 percent for the final patient age range, 65 years and older). Within these same categories, similar shifts of diagnoses relating to age were documented in the study of the content of family practice in Virginia.

When compared to other published studies with data on epidemiology of patient problems, regional differences can be anticipated, not only between major categories but also between more specific patient problems within a single category. For example, the combined incidence of hyperthyroidism and hypothyroidism was 0.71 per 1,000 patient contacts in the Wisconsin study and 1.78 for 1,000 patient contacts in Virginia, ie, more than two times greater than the incidence in Wisconsin. Furthermore, the incidence of hypothyroidism reported by Wisconsin family physicians was 0.56 per 1,000 patient contacts compared to 0.15 per 1,000 patient contacts for hyperthyroidism. In Virginia, the reverse was true; hyperthyroidism was more common (0.95 per 1,000 patient contacts) than hypothyroidism (0.83 per 1,000 patient contacts).

Such data prompt the questions: Are thyroid metabolic disturbances more common in Virginia than in Wisconsin? Is hypothyroidism more common and hyperthyroidism less common in Wisconsin than in Virginia? If so, why? Or, are the differences due to the varying language used by physicians and the coding systems employed between the two studies? More detailed studies of practice profiles between states and regions might provide answers to these types of questions.

Psycho-socioeconomic (family) problems, health promotion and patient education, and the systems approach to practice, combined with the data reported here, would fully describe the specialty of family practice.

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