

## Morbidity in Family Practice

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**I**N recent years there has been world-wide interest in the evaluation of primary patient care and its place in the provision of health services. A result of this interest has been the formation of academic departments of family medicine in several faculties of medicine, both in this country and abroad. One of the main goals of these departments should be to study and expand the body of knowledge concerning primary patient care generally and family medicine in particular.

Accordingly, the necessity for the availability of the kinds of data we wish to report within the context of a developing discipline is apparent. These data represent important aspects of primary patient care and undoubtedly must influence the development of the educational experience involving the trainee in family medicine.

### METHODOLOGY

The results that are described in this paper are generated by the Medical Care Information System, which is part of the continuing research effort of the Department of Family Medicine at McMaster University in Hamilton, Ontario. This information system was designed and implemented by a group of workers from within and from outside the health-science area. The members of the working committee included four physicians, a computer-science systems analyst, a computer programmer, a research analyst, and a methods and procedures analyst.

The earliest patient contact information entered the system in October 1967. Subsequently, modifications have been made to the system as experience has indicated which areas of the patient record required greater detail and explanation for future research.

While the activities of the family physician and his health care team are of special interest to us, the focal point of study is the family. We collect two kinds of data, non-medical and medical. Included in the former are demographic, sociologic and economic data, collected with special reference to the family. In addition

we have accumulated past health information on individual members of the family. These data were obtained by means of a mailed questionnaire.

At the present time approximately 1500 families constitute the patient population at McMaster University Clinic, the site of the study. This figure has remained constant for approximately six months. Where similar types of data allow (size of family, ages within the family, religion, country of birth), comparisons have been made between the sample population at the clinic and the population of the metropolitan Hamilton area as described in the 1966 census.<sup>1</sup> These comparisons have indicated close resemblances, which make us confident that the patient population that we are studying is representative of the population of Hamilton as a whole. From this patient population we have maintained a random sample (95% confidence, error  $\pm 5\%$ ). It is this sample, which at the present time is approximately 23% of the patient population, that provides the data for the Medical Information System.

The medical data in this system are abstracted from the patients' charts and, as with the non-medical data, are keypunched, and the magnetic tape is updated with this information on a weekly basis. Thus we create a data base with sufficient scope and depth to allow the assessment of important aspects of patient care.

The information we collect from a medical contact is centred on the three pivotal areas of the patient visit: the symptoms and complaints (or problems) as presented by the patient; the diagnosis or diagnoses (or labels attached by the physician to the patient's complaints); and the management of the problem, including the investigative procedures. This system has the capacity of relating complaints and diagnoses, as described by the physician, and indicating the "newness" of the diagnosis. In the area of investigation, important physical measurements and positive results of the examinations are collected, as well as results of some of the more common laboratory and radiological investigative procedures. In the management area, information in the system includes the consultations, by specialty type; the drugs used in the management of the patient, along with the dosage and frequency; and the non-drug treatment, including operations and procedures.

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One of the strengths of this system is that information is collected in a manner which parallels the way in which the primary physician functions. This allows us to imitate the way in which the undifferentiated problem (as posed by a symptom or a group of symptoms) is perceived, investigated and managed. The stages of understanding through which the physician passes to reach a solution of the patient's problem, whether the problem is solved or not (as indicated by a final diagnosis), and the number of visits required for the solution of a specific problem, become part of the system. In other words, we have attempted to build a system which we believe is a reliable mirror of the problem-solving procedures applied to the undifferentiated patient.

It is extremely important to note that the tables which follow represent the number of times a symptom or diagnosis was recorded, and do not represent incidence. These tables describe the information obtained from the system in the 12-month period from October 1967 to November 1968 on 3005 contacts, of which 2849 were for families and 156 were for single, unattached individuals within the sample population. Of the family contacts, 721 were phone calls, 1928 were office visits, 67 were home visits and 133 were hospital visits.

#### DISCUSSION

The coding of complaints and symptoms in our system is based mainly on a classification previously reported.<sup>2</sup> For purposes of investigating relationships, the individual complaints were re-grouped as shown in Table I.

The first-ranked group is composed of symptoms referable to the locomotor system or, more properly, complaints referable to various anatomical regions of the body. The main symptoms referable to these regions consist of various kinds of pain, swelling and paresthesias, and of these, 387 were various kinds of pain. Therefore 67% of this first-ranked group were pain complaints.

As might have been expected, symptoms referable to the respiratory and cardiovascular systems represented the next largest group of recorded symptoms. This is entirely in keeping with the experience of other studies.<sup>3</sup> Of these, 240 (55%) represented pain complaints.

Symptoms referable to the gastrointestinal system constituted a large group. This was expanded substantially by the number of complaints of various kinds of discomfort in the region of the abdomen. Again, pain represented 114 (26%) of the complaints.

The group of symptoms referable to the eye, ear, nose and throat was small, until complaints

TABLE I.—SYMPTOMS BY BROAD GROUP\*

	Frequency of occurrence	% Total†
1. Symptoms referable to the locomotor system, including the back, neck, lower extremities, upper extremities, and multiple joints...	571	13
2. Respiratory and cardiovascular symptoms, including various kinds of chest discomfort.....	439	11
3. Gastrointestinal symptoms, including various complaints of abdominal discomfort.....	432	11
4. Symptoms referable to the eye, ear, nose, throat, tongue and teeth.....	432	11
5. Symptoms related to emotional upsets, including structured psychiatric symptoms plus complaints of fatigue and tiredness, insomnia, malaise and run-down condition.....	343	8
6. Symptoms referable to the genitourinary tract.....	211	5
7. Symptoms referable to the skin and mucous membranes.....	190	5
8. Symptoms referable to the head and face.....	183	4
9. General complaints.....	179	4
10. Nervous-system complaints, excluding psychiatric.....	59	1
11. Breast complaints.....	22	1
12. Miscellaneous.....	1060	26
Total.....	4121	

\*These symptom groups represent 99% of the total symptoms recorded.

†These values indicate the percentage of frequency of occurrence of each table entry compared to the total frequency of all the table entries.

which would represent, by and large, modalities of pain affecting these regions were added. Complaints of various kinds of discomfort to these regions represented *over 66% of the total*.

Of particular note is the high recording of emotional symptoms, which represent 343 or 8% of the table total. This group was not particularly large until we added such common psychosomatic symptoms as fatigue and tiredness, insomnia, malaise and run-down condition, bringing it to a sizable group. However, approximately one-half of this group represents symptoms that we can clearly and formally recognize as being emotional, such as crying, unhappiness, irritability, personal problems, family problems, and so on. It is our belief that this entire group represents only the top of the iceberg, but it does help to put into perspective the high frequency of psychiatric morbidity in this population.

The group representative of genitourinary symptoms was moderately sized. This group consisted chiefly of symptoms referable to the lower urinary tract and to various kinds of menstrual

TABLE II.—FREQUENCY OF COMMONER SINGLE SYMPTOMS\*

	Frequency of occurrence	% Total†
1. Cough.....	243	15
2. Throat soreness.....	129	8
3. Fever and chills.....	120	8
4. Headache.....	105	6
5. Colds.....	103	6
6. Regurgitation and vomiting.....	92	6
7. Skin rash.....	85	5
8. Fatigue and tiredness.....	84	5
9. Abdominal pain.....	67	4
10. Back pain.....	65	4
11. Depression, crying and unhappiness.....	60	4
12. Chest pain.....	56	4
13. Earache.....	55	3
14. Nausea.....	55	3
15. Dyspnea.....	54	3
16. Eye, ear, nose and throat discharge.....	48	3
17. Anorexia.....	47	3
18. Nocturia, frequency.....	44	3
19. Dizziness.....	43	3
20. Insomnia.....	41	3
Total.....	1596	

\*These symptoms represent 38% of the total symptoms recorded.

†These values indicate the percentage of frequency of occurrence of each table entry compared to the total frequency of all the table entries.

disorders. There was only a very small group that represented genital pain.

Of the group of symptoms that comprised skin and mucous membrane complaints, 85, or nearly 45%, were complaints of rash. This is a much smaller percentage than was recorded by Bower *et al.*,<sup>3</sup> who reported skin rash as ranking fifth in a comparable table of complaint frequencies (excluding recheck visits of various types). These findings suggest that strong emphasis on the teaching of skin disorders is not clearly indicated. It may mean, however, that skin disorders are self-limiting and of short duration and therefore do not rank high in a study carried out in this fashion.

In the group of symptoms referable to the head and face, 133 consisted of various kinds of head and face pain.

The group designated as general complaints was composed chiefly of symptoms which could not be easily assigned to any specific system or anatomical area of the body.

Pain as an important theme seems to recur throughout the symptom groups in Table I. This may mean that the primary physician should have a higher level of understanding of the anatomical, physiological and psychological aspects of pain than any other physician.

Table II reflects the commonest single symptoms extracted from the broad groups of Table I. Cough is the commonest symptom seen by the

primary physician, and is seen nearly twice as frequently as any other symptoms listed. In addition, symptoms referable to the respiratory system compose a total of 632 or 40% of the table total, the majority of these being infections.

The high ranking of emotional problems as a group is not reflected in this table, and therefore it would appear that these symptoms do not rank high as single complaints, but rather as composites. For instance, if we add fatigue, depression and insomnia together, we have a high-ranking group. Headache is also a very common symptom as seen in this population, and although not a formal indication of emotional problems, is very often linked with tension and anxiety, etc.

This table gives some indication of the breadth of symptoms encountered in family medicine, and some insight into the spectrum of diagnostic skills required by the physician.

The top six categories of diagnoses tend to be a reflection of the top six categories of symptoms (Table III). It is noteworthy, however, that diseases of the digestive system occupy a low position and do not reflect the high frequency of symptoms referable to the abdomen and gastrointestinal system. This may mean that such symptoms often occur: (a) without a specific diagnosis being made or (b) as a manifestation of disease elsewhere. One might conclude that a high degree of skill is required on the part of the physician in dealing with these problems.

TABLE III.—DIAGNOSTIC CATEGORIES BY FREQUENCY\*

	Frequency of occurrence	% Total†
1. Respiratory system.....	494	20
2. Circulatory system.....	363	15
3. Allergic, endocrine, metabolic and nutritional.....	247	10
4. Genitourinary.....	214	9
5. Mental, psychoneurotic and personality disorders.....	210	8
6. Injuries and adverse effects.....	207	8
7. Bones and organs of movement.....	158	6
8. Symptoms of senility and ill-defined conditions.....	150	6
9. Digestive system.....	136	5
10. Skin and cellular tissue.....	124	5
11. Diseases of the nervous system.....	94	4
12. Infective and parasitic diseases (e.g., tuberculosis, measles, mumps, etc.).....	81	3
Total.....	2478	

\*These diagnostic categories represent 91% of the total diagnoses recorded.

†These values indicate the percentage of frequency of occurrence of each table entry compared to the total frequency of all the table entries.

TABLE IV.—COMMONEST SINGLE DIAGNOSES RECORDED\*

	Frequency of occurrence	% Total†
1. Obesity . . . . .	113	16
2. Hypertension . . . . .	108	15
3. Anxiety . . . . .	107	15
4. Otitis media . . . . .	94	13
5. Acute pharyngitis . . . . .	74	10
6. Arteriosclerotic heart disease . . . . .	54	7
7. Tonsillitis . . . . .	47	6
8. Acute bronchitis . . . . .	42	5
9. Depression . . . . .	42	5
10. Other heart disease (e.g., myocardial ischemia) . . . . .	42	5
Total . . . . .	723	

\*These diagnoses represent 26% of the total diagnoses recorded.

†These values indicate the percentage of frequency of occurrence of each table entry compared to the total frequency of all the table entries.

It is of interest to note the emergence of the large group entitled "Injuries and Adverse Effects of Chemicals, Drugs and External Agents", consisting mainly of sprains, soft-tissue injuries, fractures and dislocations.

In the conditions classified as "Allergic, Endocrine, Metabolic and Nutritional Diseases", the diagnoses of obesity, myxedema and diabetes represent 66% of the total, and 46% of the whole group is represented by obesity.

In the group "Mental, Psychoneurotic and Personality Disorders", the diagnoses of anxiety reaction and depressive reaction represent 71% of the total. It is also of interest that the diagnosis of schizophrenia is recorded only twice.

It is important to note that this table conforms to the International Classification of Diseases, Adapted,<sup>5</sup> with one exception. We have taken specific ear infections out of the category "Diseases of the Central Nervous System and Sense Organs" and have added them to "Diseases of the Respiratory System".

Comparison of this table with the findings of Steele, Kraus and Smith<sup>6</sup> and the National Disease and Therapeutic Index<sup>7</sup> indicates the general prominence of diseases of the respiratory system. There is close agreement between the four highest-ranked groups under study and the N.D.T.I.

Other items of interest not included in this table are the following: (a) Diseases of the blood and blood-forming organs made up a very small group, consisting almost entirely of anemia; only 28 such diagnoses were recorded. This low number may relate to the state of nutrition of the population we are dealing with; it may mean, however, that the population is not being screened frequently enough for anemia. (b) There is a very low recorded number (20) of

complications of pregnancy. (c) The diagnosis "congenital abnormalities" was recorded eight times. (d) There is a low frequency of neoplasms recorded; only 20 out of the total of 52 in this group were malignant neoplasms.

The small size of the groups mentioned has implications in terms of curriculum planning. The difficulties for the primary physician in maintaining judicious indices of suspicion for these uncommon diseases is apparent. Perhaps new methods of teaching are required for dealing with these uncommon but important problems.

Table IV represents the commonest single diagnoses recorded as extracted from the diagnostic categories shown in Table III. Once again, it is clear that infections of the respiratory tract, emotional disorders and cardiovascular disease, along with obesity, are the commonest diagnoses recorded on this population. This has also been found in other studies.<sup>4, 7</sup>

Infections of the upper respiratory tract especially are frequently diagnosed, reinforcing the belief of many that more definitive criteria for the treatment of these conditions need to be made available to the primary physician. This has importance, of course, in a rational application of chemotherapy.

The high incidence of emotional diagnoses makes it clear that a satisfactory understanding of human behaviour and the various concepts of deviant behaviour, as well as a practical approach to dealing with these problems, should take high priority in the training of family physicians.

Based on our present knowledge of the links between obesity and cardiovascular disease, we can discuss these two conditions together. There are numerous studies which show the high degree of correlation between these two. From this we might postulate that the role of the primary physician, as a therapeutic counsellor, in this era of chronic degenerative disease needs to be expanded. He will require special skills as a motivator to help prevent this group from travelling the pathway to serious degenerative disorder. He must also have at his fingertips the morbidity and mortality statistics around which he can focus this type of counselling.

#### CONCLUSION

We would like to emphasize the fact that the data described represent patient contacts, not episodes of illness, and are a routine output of the information system. It is our belief that the data base has an inherent flexibility which allows us to study the problems of the ambulant patient

within the context of continuing comprehensive care. Furthermore, we feel that if family medicine is to evolve as a discipline, such systems which will supply heretofore unknown information must be developed. The formulation of rational, educational objectives rests to a large degree on the information so provided.

A number of important problem areas have been identified. Pain ranks extremely high as a presenting symptom to the family physician. Based on this information, we can place suitable emphasis on an in-depth understanding of the anatomic, physiologic and psychologic components of pain. The high incidence of respiratory system disorders, particularly infection, identifies an area in which the physician will require special training and competencies. In addition, it highlights the need for technical facilities on which valid criteria of treatment can be based.

Special skills and insight into human behaviour, along with a familiarity with the various psychotherapeutic models, are clearly indicated by the high degree of psychiatric morbidity found.

The high frequency of obesity and cardiovascular disease points up a well-known relationship. It also identifies a need for counselling skills so that these problems can be dealt with effectively. Perhaps new modalities of treatment for these disorders are also required.

**Summary** One of the major difficulties in preparing physicians for primary care in the community is the lack of available information about the nature of problems encountered by such physicians.

This paper describes a system operational since October 1967 which captures on computer-tape social- and medical-contact data on a random sample of patients attending a family practice clinic.

Medical-care event records were created, from which important elements of the doctor-patient encounter could be abstracted and translated into a computer-readable document. These elements include problems as related by the patient, the diagnosis applied by the physician, and the investigations and treatment centred on these problems.

Tables are presented which show frequency lists of the commonest symptoms and diagnoses, both by broad group and singly. From these tables observations in four main areas of importance are made. These are: (a) high frequency of pain; (b) the high frequency of respiratory problems, particularly in-

fection; (c) the high frequency of emotional problems; and (d) the high frequency of degenerative problems, particularly obesity and cardiovascular-system problems.

Recommendations attendant on these problems are made concerning both the training and functioning of the family physician.

**Résumé** Une des plus grandes difficultés qu'on rencontre dans la tâche de préparer le généraliste à exercer son art dans une collectivité est l'absence de renseignements sur la nature des problèmes que rencontre ce genre de médecins.

Le présent article décrit un système en vigueur depuis le mois d'octobre 1967 et qui permet d'enregistrer sur ruban d'ordinateur des données relatives aux contacts sociaux et médicaux que peut avoir le médecin avec un échantillonnage de malades fréquentant une clinique de médecine générale.

On a créé des cas-types de soins médicaux, dont on a extrait certains éléments capitaux des contacts médecin-patient et qu'on a traduit dans un document que peut lire l'ordinateur. Parmi ces éléments figurent les problèmes du malade, le diagnostic du médecin et les observations et le traitement centrés sur ces problèmes.

On trouve dans cet article des tableaux qui donnent, par ordre de fréquence, la liste des symptômes et diagnostics les plus courants, pour l'ensemble du groupe et séparément. De ces tableaux ont été tirés des renseignements dans quatre domaines principaux: (a) la grande fréquence de la douleur, (b) la fréquence élevée des troubles respiratoires, particulièrement de l'infection, (c) la fréquence également élevée des problèmes de comportement et (d) la grande fréquence des troubles de dégénérescence, surtout l'obésité et les désordres de l'appareil cardiovasculaire.

En terminant, les auteurs donnent des conseils concernant ces problèmes et destinés à la formation et à la pratique du médecin de famille.

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