

An Information System for Family Practice

Part 3: Gathering Encounter Data

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This paper describes the development of a system for recording encounter data in family practice. The system has been developed by the Department of Family Medicine, University of Western Ontario, and came about as a natural addition to a previously reported method for describing and defining a practice population.

The system gathers information on each encounter and includes data concerning the patient, the provider, the location, and certain other details concerning the encounter, including all problems dealt with on that occasion. The storage and analysis of these data are carried out by a computer. The uses of such data are many, and some of them will be dealt with in the fourth and last paper in this series.

The gathering of encounter statistics in family practice is not a particularly new activity, but it was not until the development of academic departments of family medicine that integrated systems for such data recording began to appear in any numbers. Farley and his colleagues have described such a system within the past two years.¹⁻⁸ We are also aware of other systems which exist in academic practices, and it is likely that only in such a setting can a complete system of this kind be sustained.

It is important to realize that encounter information can be much broader in scope than morbidity information alone. A number of methods for gathering encounter data exist, each with limitations. The E-book⁹ is a commonly used manual method and, though it lends itself to ready retrieval of limited amounts of information, extensive cross-analyses are not possible unless the data can be entered into a computer. Clute,¹⁰ in his pioneer study of Canadian general practice, derived his information from a sample of general practitioners who were interviewed and observed by experienced physicians over a relatively short period of time. Because there was no denominator for the data, the validity of morbidity data gathered in this way has to be questioned.

In the United Kingdom, morbidity statistics from general practice have been gathered for many years, particularly in the First and Second National Morbidity Surveys.¹¹ These surveys must certainly be regarded as most currently representative of the work of the general practitioner, but they are limited in that only one problem per encounter was usually listed. Such surveys tend to be static, and are not designed with the flexibility of method which would permit the answering of new questions.

The National Ambulatory Medical Care Survey¹² is starting to yield data valuable for morbidity comparisons. It has the same limitations as the British National Morbidity Surveys, and because it extrapolates from a sample of the population of the United States, its results need more rigorous confirmation at regional and national levels.

Methods

There is much more than morbidity information to be obtained from the encounter between the patient and the health-care professional. Though the Department started this part of the system with the intention of gathering

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morbidity data alone, it came to realize that certain aspects of problem-solving, beyond diagnosis itself, would not only be more interesting, but would serve a wide range of purposes. A further objective, incorporated as the project evolved, was that of flexibility in accommodating to future studies and questions.

We began with a desire to collect a great deal of information from each encounter, but our familiarity with the difficulties others^{1,3} have had in working with large quantities of information from the clinical record led us to limit severely the amount of data collected. We further believe that the information should be recorded by the provider of the service, rather than by a research assistant.

The initial version of the data-gathering form (Visit Data Sheet) was developed, and a pilot study implemented, in early 1972. On the basis of that experience, Version 1 of the Visit Data Sheet was implemented in all of the teaching practices in June 1972. Version 2 of the Visit Data Sheet (Figure 1) was implemented in April 1973, and it added to Version 1 a mechanism for distinguishing the first visit in any episode from subsequent visits for the same episode. This is a most important requirement for the accurate calculation of incidence and prevalence rates.

Data Acquisition

The Visit Data Sheet is completed for every encounter between a patient and a health-care professional in the teaching practices, with the single exception of in-hospital visits. For those encounters occurring inside the teaching center, and this includes the majority of encounters, the procedure is as follows:

1. In advance of the patient's arrival, the identifying information on the portion of the Visit Data Sheet above the dotted line (Figure 1) is

filled in. The source of this information is generally the Household Data Sheet, which is located inside the front cover of the household record.¹⁴

2. The Visit Data Sheet then goes with the chart to the provider for that encounter.

3. Following the encounter, the provider completes the portion of the Visit Data Sheet below the dotted line.

4. The sheet then goes to the person responsible for coding; this person makes certain that the form is complete, returning incomplete ones to the provider.

5. Following the completion of the coding, the information on the sheet is transferred to punched cards, which are used to update the Encounter Data File. The Visit Data Sheet has been designed for transfer of information to punched cards without the intervening step of coding sheets.

From an examination of the results obtained from previous versions of the Visit Data Sheet, the Department of Family Medicine has arrived at some conclusions regarding the minimum number of items of encounter information to be gathered on an ongoing basis. These items include: the date of service, the place of service, identification of the provider, identification of the patient (including age and sex), and a listing of every problem dealt with during the encounter. Others,¹⁻⁸ independently engaged in a similar process of systems design, have arrived at the same conclusions. Other items can be added, as required, for special studies and to answer specific questions.

Figure 1 demonstrates the presence of the minimum data set. Surname is used for administrative purposes only. The Patient Number is a unique six-digit number (four-digit prefix identifying the family, two-digit suffix identifying the individual within that family), and it permits linkage between the Household Data File, the Encounter Data File, and the clinical record for that patient. The Health-Care Professional Number is assigned to that particular provider, so long as he is responsible for the care of patients in one of the Departmental teaching practices.

Below the dotted line, the Visit Data Sheet allows for the listing of more than one problem; up to five are permitted, though it is uncommon for this number to be reached. The form

permits each problem to be further specified as to:

- N — *new*: the first time this problem has been identified, by any health-care professional, during the current episode.
- C — *continuing*: the patient has been seen previously in this episode, by this or by another health-care professional.
- R — *recurrent*: the first time the patient has been seen for this episode of a problem which tends to recur (eg, peptic ulcer). In practice, this category has proven difficult to capture accurately and will be dropped in future revisions of the form. N and R are generally added, in order to arrive at incidence rates for any problem.

Problem labels are expected to reflect the level of sophistication of the diagnostic process and, hence, will include clear-cut diagnoses, abnormal physical findings, abnormal laboratory tests, symptoms, and health risks. Standardization of the coding of a wide range of problem labels is difficult, and though the health-care professional is encouraged to use problem labels encompassed by the code, coding personnel have to develop considerable skill in interpretation. A steadily growing alphabetic index has greatly facilitated this task.

The code employed currently is the "short list" of the International Classification of Diseases, originally developed by the Royal College of General Practitioners, later modified by Dr. David Metcalfe,¹⁻⁸ and further adapted by the Department, with particular additions in the area of social and emotional problems. It is the intent of the Department to adopt the International Classification of Health Problems in Primary Care (ICHPPC), as this code will make our data more readily comparable with international primary care statistics, and because it is compatible with the present code.

The following specific points relate to Figure 1:

1. *Origin of Contact* — This allows a comparison to be made between follow-up visits, previously arranged by the provider of the service, and visits for which the arrangements were

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<table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th rowspan="2">PROBLEMS</th> <th colspan="3">N C R</th> <th colspan="4">CODE</th> </tr> <tr> <th>1</th><th>2</th><th>3</th> <th>26</th><th>27</th><th>28</th><th>29</th> </tr> </thead> <tbody> <tr> <td>1. _____</td> <td></td><td></td><td></td> <td>30</td><td>31</td><td>32</td><td>33</td> </tr> <tr> <td>2. _____</td> <td></td><td></td><td></td> <td>34</td><td>35</td><td>36</td><td>37</td> </tr> <tr> <td>3. _____</td> <td></td><td></td><td></td> <td>38</td><td>39</td><td>40</td><td>41</td> </tr> <tr> <td>4. _____</td> <td></td><td></td><td></td> <td>42</td><td>43</td><td>44</td><td>45</td> </tr> <tr> <td>5. _____</td> <td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> </tbody> </table> <p>(a) List in order of importance. (b) Do not use the term "No Problem." (c) Only Problem 1 may be referred to in Follow-Up or Referral/Consultation. (d) Remember to check <u>one</u> of N, C, or R.</p>	PROBLEMS	N C R			CODE				1	2	3	26	27	28	29	1. _____				30	31	32	33	2. _____				34	35	36	37	3. _____				38	39	40	41	4. _____				42	43	44	45	5. _____								<p>ORIGIN OF CONTACT (Only one box)</p> <table style="width:100%; border: none;"> <tr><td style="width:80%;">Health-Care Professional...</td><td style="border: 1px solid black; width: 20px; text-align: center;">46</td></tr> <tr><td>Patient.....</td><td style="border: 1px solid black; text-align: center;">1</td></tr> <tr><td>Parent.....</td><td style="border: 1px solid black; text-align: center;">2</td></tr> <tr><td>Other.....</td><td style="border: 1px solid black; text-align: center;">3</td></tr> <tr><td>Specify _____</td><td style="border: 1px solid black; text-align: center;">4</td></tr> </table> <p>(a) H.C.P. —you asked the patient to return now. (b) Patient—the patient came on his own. (c) Parent —the patient was brought by a family member (d) Other —the patient was advised to come in by another H.C.P., agency, etc.</p>	Health-Care Professional...	46	Patient.....	1	Parent.....	2	Other.....	3	Specify _____	4
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Column 80: Code 2

Figure 1. Version 2 of the Visit Data Sheet

made by the patient, parent, or other person or institution.

2. *Initial Reason for Contact* — The main purpose was to demonstrate the way in which problems might be discovered during the course of visits ostensibly planned for routine purposes (eg, "check-up examination"). Experience has demonstrated that this type of information need be gathered only over a short period of time, and this item will not be included in future versions of the Visit Data Sheet.

3. *Follow-up and Referral/Consultation* — These apply only to Problem 1, and they describe certain aspects of problem management, which follow upon the creation of a problem label. The value of these data is limited because they refer only to Problem 1, and future studies of this aspect of problem-solving — ie, problem management — will be more detailed.

A special problem in data acquisition has been the temporary or transient patient. Though a Visit Data Sheet is completed each time such a patient is seen, he has no unique identifying number, and therefore the information cannot be entered into the Encounter Data File. A convention is being adopted that all transients should be identified by the same number and considered to be a single patient with a large number of visits. Though the sophistication of analysis allowed by a unique patient identifier will necessarily be lost, this convention will allow more accurate recording of the workload of health-care professionals.

The Encounter Data File

The person responsible for coding the Visit Data Sheet checks to make sure the Visit Data Sheet is complete, returning incomplete forms. Each problem is given a three-digit code; N, C, and R receive a one-digit code; the rest of the form is self-coding.

Once coding is complete (every effort is made to keep it up on a daily basis), the Visit Data Sheets are hand-sorted in patient number order and are merged with sheets previously collected. At the end of a period of time, usually two weeks, the sheets are used to create punched cards, which are batch-processed to update the Encounter Data File.

Medical Center Visit Merge Update (MCVMU), the computer program which creates and updates the Encounter Data File, follows much the same format as Medical Center Family Merge Update (MCFMU), described in a previous article,¹⁴ and will not be further described here. MCVMU can be made available upon request. Many programs have been written for the analysis of encounter data in the system. Some of the many uses to which the Department has put these data will be described in a subsequent article in this series.¹⁵

Conclusion

The Encounter Data System of the Department of Family Medicine, University of Western Ontario, permits the description of morbidity patterns of a registered practice population in the teaching centers of the Department. This population is generally representative of the city of London,¹⁶ and is used as a denominator for morbidity rates which will be presented in the subsequent paper. A considerable degree of flexibility exists in the system, allowing presentation of data in a variety of formats for service, educational, and research purposes. The system has also been designed with the flexibility to accommodate to new questions which must inevitably be raised by the work already done.

The value of an ongoing system which requires some data input from the provider of care cannot be overestimated. The system would require modification were it to be introduced to private practice. In the academic setting of the Department of Family

Medicine, it continues to demonstrate its worth and versatility.

Acknowledgement

This system was funded in part, during its developmental stage, by a Demonstration Model Grant (D.M. 46) from the Ontario Ministry of Health.

References

1. Farley ES, Treat DF, Baker CF, et al: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 1. The age-sex register. *J Fam Pract* 1(1):44-46, 1974
2. Froom J: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 2. Classification of diseases. *J Fam Pract* 1(1):47-48, 1974
3. Froom J: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 3. The diagnostic index-E-book. *J Fam Pract* 1(2):45-48, 1974
4. Froom J: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 4. Family folders. *J Fam Pract* 1(2):49-51, 1974
5. Farley ES: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 5. Implications of filing charts by area of residence. *J Fam Pract* 1(3/4):43-47, 1974
6. Froom J: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 6. The problem-oriented medical record. *J Fam Pract* 1(3/4):48-51, 1974
7. Froom J: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 7. The encounter form and the minimum basic data set. *J Fam Pract* 2:37-41, 1975
8. Treat DF: An integrated system for the recording and retrieval of medical data in a primary care setting. Part 8. The individual patient's medical record. *J Fam Pract* 2:43-53, 1975
9. Eimerl TS, Laidlaw AJ: *A Handbook for Research in General Practice*. Edinburgh, E&S Livingstone, 1969
10. Clute KF: *The General Practitioner*. Toronto, University of Toronto Press, 1963
11. Royal College of General Practitioners: *Morbidity Statistics from General Practice — Second National Study 1970-71*. London, Her Majesty's Stationery Office, 1974
12. DeLozier JE, Gagnon RO: *National Ambulatory Medical Care Survey, 1973 Summary*. DHEW Pub. No (HRA) 76-1772
13. O'Connell BP, McFarlane AH: A medical care information system: An approach to the computerization of ambulatory patient records. *Med Care* 8:82-87, 1970
14. Newell JP, Bass MJ, Dickie GL: An information system for family practice. Part 1: Defining the practice population. *J Fam Pract* 3:517-520, 1976
15. Dickie GL, Newell JP, Bass MJ: An information system for family practice. Part 4: Encounter data and their uses. *J Fam Pract* 3:639-644, 1976
16. Bass MJ, Newell JP, Dickie GL: An information system for family practice. Part 2: The value of defining the practice population. *J Fam Pract* 3:525-528, 1976