# THE STRUCTURE AND FUNCTION OF A FILE OF PATIENT HEALTH DATA IN GENERAL PRACTICE

CHARLES HODES, M.B., Ch.B., D.Obst.R.C.O.G., M.R.C.G.P.
Boreham Wood, Hertfordshire

THE GENERAL practitioner, in contact with the patient at all times in his life, is in a most favourable position to record and assess the disease processes to which the population is exposed. In addition, the information available to the family doctor allows him to make community and social studies of considerable importance.

Acheson, in the Oxford Record Linkage Study, has shown the value of proper recording and the results already obtained are of considerable importance. Galloway in West Sussex, has used automatic data processing in local health administration with particular emphasis on vaccination and immunization. In the hospital field, Holland at St. Thomas's Hospital is studying improved methods of keeping patients' records. General practice, with the ancillary help and public health attachments it can now have, has much to offer. With the aid of a generous grant from the Ministry of Health, a study in a group practice has been set up to examine patient data, with particular reference to screening procedures.

## Method

The essential requirement of this project is a register of patients. Ledger systems and punch-cards are unsatisfactory because they are bulky, slow to operate, tiring and therefore liable to error, and relatively high in staff demands in operating time, and consequently relatively expensive. Automatic data processing involves storage and transporting of cards for the necessary processing and is also relatively expensive.

The most sophisticated method—the computer—offers a system with the following advantages:

1. No storage problems.
2. Up-to-date information in and out.
3. Reduction in labour and therefore costs.

J. ROY. COLL. GEN. PRACTIT., 1968, **15**, 286

4. Efficient handling.
5. Speed.
6. No restriction of record size.
7. Surveillance of patients.
8. Assessment of "normal".
9. Analysis of results, e.g. tabulation.

The computer to be used is a N.C.R. 315 system. This is a compact modular electronic data processing system broadly expandable so that it can be applied as a small-scale system or built up to one with large-scale capacities. It has the speed and efficiency to handle scientific problems and as it has an automatic interrupt feature can provide time sharing. Data is input by punched paper tape and output by high-speed printer. The data is stored on magnetic cards and need not be sorted in order to process it against a file, and the entire file need not be read to update a portion of it. A deck of 256 magnetic cards can be mounted on a single Cram

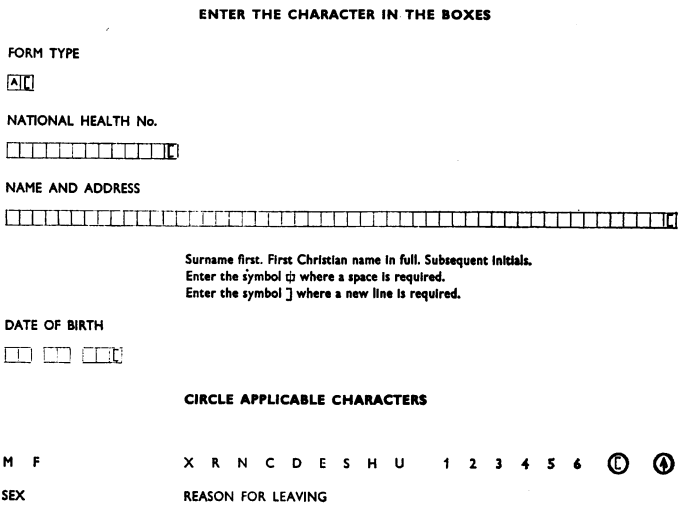


Figure 1

CODE

X = On removal, transfer to another doctor within E.C. area.
R = Removal to another E.C. area.
N = Transfer to another doctor within E.C. area after giving notice.
C = Transfer to another doctor within E.C. area with previous doctor's consent.
D = Death.
E = Embarkation.
S = Enlistment.
H = Mental hospital.
U = Duplicated.

file providing over 5.5 million characters of information. This represents more information than could be punched into 69,000 punched cards. In a single computer run, information can be sorted; all related records can be updated; report information can be generated and stored; additional programme information read and reports printed out.

The efficiency of the system depends, to some extent, on the ease of data collection, and to this end special forms and techniques have had to be developed. All patients on a doctor's National Health Service list are known at the appropriate executive council. With the co-operation of the Clerk and Registrar of the Hertfordshire Executive Council, information about all patients on the N.H.S. list of the practice was entered on an arrival and departure form (figure 1 with Code).

The N.H.S. number is used throughout the United Kingdom; in England, Wales and Scotland it consists of a maximum of twelve digits (usually four letters and eight numbers), and in Northern Ireland it has a maximum of ten digits, being a combination of letters and numbers.

The numbers shown on figure 1 are not used at present, but can be allocated for any special purpose; there is also a procedure for deletions and amendments. This arrival and departure form is then sent for punching and inclusion in the patient record file. This file will gradually grow as more patients are included and more facts are included against existing ones. Each patient would be

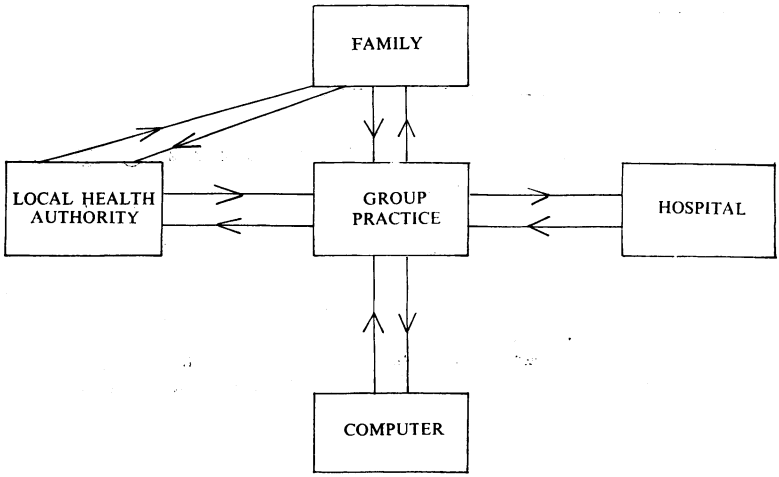


Figure 2
Position of group practice

known by his N.H.S. number and date of birth, which must therefore accompany any information which relates to him. Probably once a month, although it could be more frequently if required, the collected data would be processed. This means that all new data since the last computer run must first be input and added to the patient record file. Details of the tables that it is required to produce are then fed into the computer and the patient record file is scanned as many times as is necessary to extract the requested data. Finally, the tables are printed out on the line printer.

This new position of general practice can be diagrammatically shown as in figure 2. With the attachment of local authority staff to practices, more information is accessible and has to be stored. A new range of work that can now be undertaken and the results constantly examined is now possible (figure 3).

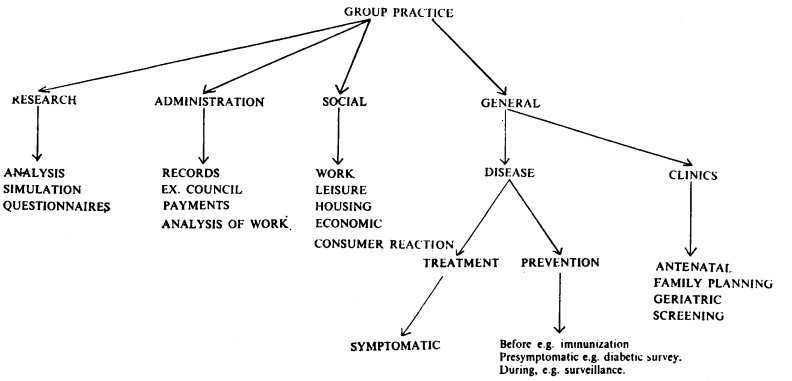


Figure 3
Work of group practice

## Discussion

Many situations exist which can be readily adapted to this system. The International Classification of Diseases is already numbered and easily adapted. The work done by doctors, health visitors and nurses can be coded and then entered. The distribution of variables in the population and for the individual can be determined.

On the research side the material is readily analysed and tabulated. Simulation techniques have to be developed to enable rapid changes in methods and the use of staff to be made.

The general administration should be facilitated, and movement of patients, payments, and analysis of work load easily assessed.

Community and social studies must be part of the development, and a programme for questionnaires has been worked out. This

permits a survey to be carried out, analysed and tabulated, and the information can then be erased from the computer file and the space used again for other work.

In the field of preventive medicine, immunization schemes are already in use. Appointment cards with the type of immunization are printed by the computer and addressed to the patient (complete with date of birth). An automatic recall procedure ensures that all injections and vaccinations are given at the right time. A diabetic survey has been in progress since January 1966; basic information storage, urine examination with and without glucose loading, supervision of prediabetics and diabetics are all possible with an increased efficiency.

Multiple screening in general practice is now a real possibility using this system. Work on selected age groups has been started here. This includes body measurements, blood pressure, tonometry, cervical smears, breast examination, chest x-ray, respiratory function, and a large number of biochemical estimations. It is hoped that a preliminary report will shortly be available.

A combination of data from the routine curative and preventive work of the general practitioner with those from multiple screening, will provide a high standard of patient care and facilitate operational research. In this case the county computer is being used, but throughout the country there are computers which should be available to general practitioners.

Increasing demands for medical care and a reduction in the manpower make it essential that all modern facilities are available to general practice.

## Summary

A method is described which will allow a high standard of medical care, with information readily available, accurate and up to date. The general practitioner's position in the health field and his relationship with his patients make him best suited to be responsible for his patients' health data.

### Acknowledgements

This work is supported by a grant from the Ministry of Health. For advice and assistance I am indebted to Drs T. E. A. Carr, A. Bryce Stewart and J. M. G. Wilson of the Ministry of Health; Dr G. W. Knight, county medical officer of health, Hertfordshire; Mr J. Alexander, county treasurer, Hertfordshire; Mr W. F. Banks, clerk to the Hertfordshire Executive Council; Dr C. C. Spicer, director, Computor Unit, M.R.C.; and to Drs J. H. Marks, S. E. Nathan, G. D. Ripley and the staff of the group practice.

### REFERENCES

Newcombe, H. B., James, A. P., and Axford, S. J. (1957). Reports of the Atomic Energy of Canada Ltd. Nos. 470 and 511. Atomic Energy of Canada Ltd., Chalk River, Ontario.

Acheson, E. D. (1964). *Brit. J. soc. prev. Med.*, **18**, 8.
Oxford Regional Hospital Board (1964). Operational Research Unit. *Computer simulation of a maternity hospital*, Oxford.
National Cash Register Co., Ltd, London.
Seale, J. R. (1959). *Lancet* **2**, 555. (1960) *Lancet* **1**, 1939. *Lancet*. **2**, 696.
Office of Health Economics (1964). *New frontiers in health*. London.
Office of Health Economics (1965). *Surveillance and early diagnosis in general practice*. London.
The Records and Statistical Unit, *J. roy. Coll. gen. Practit.* (1963). **6**, 204.
Medical Research Council (1965). *Mathematics and computer science in biology and medicine*, Her Majesty's Stationery Office.
Elliott Automation, Progress in Medical Computing (Symposium), London, 1965.
Kent, A. (1966). *J. Amer. med. Ass.* **196**, 927.
Payne, L. C. (1966). *An introduction to medical automation*. London. Pitman Medical Publishing Co., Ltd.

## EDWARD PERCY PLANTAGENET MACLOGHLIN OF WIGAN

C. ALLAN BIRCH, M.D., F.R.C.P.
Enfield

IT IS PROBABLE THAT FEW members of the Royal College of General Practitioners know that the house of the Royal College of Surgeons owes much to the fruits of many years of hard work in general practice, yet the money which paid for the magnificent marble floor in the entrance and main hall of the Royal College of Surgeons was earned by Dr Macloghlin, a family doctor in Wigan, Lancashire.

Edward Percy Plantagenet Macloghlin was born in Wigan on 2 August 1855. He received his medical training at University College, Liverpool—then part of the Victoria University of Manchester. It is not known where he went to school. He qualified M.R.C.S. in 1884, and settled in Wigan where he practised with Dr Barnish. He had a large and successful practice, but ill-health compelled him to retire to Southport where he died on 17 April 1904.

Dr and Mrs Macloghlin were great friends of the sculptor, Alfred Gilbert who executed a study of them in bronze entitled, *Mors Janua Vitae* (Death, the gateway of life), which stands in the College. Dr Macloghlin's ashes were placed in an urn forming part of this bronze. His wife's ashes were mingled with those of her husband in 1929.

As well as giving this piece of bronze statuary to the College, Mrs Macloghlin left £10,000 to the College to found a scholarship, and also presented the Piastraccia marble floor, which cost £650. One of the marble slabs of the floor is inscribed in small lettering:

*This marble floor to the Royal College of Surgeons, from Eliza Macloghlin. 1911.*

Thus it is that surgery is indebted to general practice.