

Experience with an ICL 1905 computer in general practice

G. M. CLAYTON, M.B., B.S., B.SC., M.R.C.G.P.
Norwich

A GOOD WORKING KNOWLEDGE OF the contents of the practice filing cabinet is a most useful tool for the general practitioner. In an attempt to rationalize and to systematize this buried information many practices keep a number of different registers. There are age-sex registers, cytology registers, obesity registers, immunization registers, geographical registers. The starting and maintenance of these registers is a time consuming bore, but their usefulness in the furtherance of an active, as opposed to the more traditional passive, approach to the question of disease in the community is not denied. It is a field in which straight-forward application of the computer is admirably suitable. It may be thought that it would be simple to programme a computer for maintaining a practice magnetic tape which could be kept in the consulting room desk and used whenever a new register is required. The problem, however, is more complicated than appears at first sight—and all the more interesting for it.

The technique of simple programming can be learnt with little difficulty. The initial groundwork was laid by evening lessons at the Norwich City College. Early attempts at programming a practice system were inadequate for the purpose in mind. Their preparation, however, led to further work with the Computing Centre at the University of East Anglia where both the philosophy of programming and its detailed application were clarified.

A difficult and principal problem at the beginning is to decide which information is to be recorded and stored on the final magnetic tape. It was decided to record items under the following four headings. Each group to be entered into the system by using a different layout of a standard Hollerith card.

- (1) *More or less unchanging data.* Name, sex, date of birth, date of joining, occupational class, marital status, NHS number.
- (2) *Address and map reference.*
- (3) *Illness.* Four items of illness coded in accordance with the RCGP classification of morbidity with their dates and a note on treatment. Date and cause of death. Date and reason for leaving the practice.
- (4) *Clinical procedures.* Room for four measurements with automatic storage of the level and date of the highest, lowest and most recent measurement only. At present in use are weight, haemoglobin and blood pressure. There is a facility for converting avoirdupois into kilograms and per cent Hb into grams per cent. One space is not used but could easily be brought into use for such a measurement as peak flow rate or serum cholesterol. Room also for the dates of up to 14 different procedures. At present there are diphtheria, pertussis, tetanus, polio, smallpox, BCG, rubella and measles immunizations. Also positive and negative cervical smears.

Programmes have been written to accept and check data from punched cards and to maintain a practice master file from them. The results are in the form of lists constituting practice registers of various sorts which can be obtained by using the master tape with other programmes. It is not a difficult matter to produce an age-sex register, a state of immunization register for a stated age group, a cytology register with dates and results of examination, an obesity register, an anaemia register which can be combined with one for those who have had gastro-intestinal surgery, a register of those with chronic chest disease who might benefit from influenza vaccine. The number of variations on this theme is limited only by the content of the master file and the interests of the general practitioner.

Data is entered, in the consulting room, straight onto computer coding paper. In this form it is readily understood by the card punch operators and no special stationery is required. This coding paper is in effect squared paper marked off into columns and lines. There are 80 columns corresponding with the 80 punching positions of a Hollerith card. Each line

represents one card. Data has to be written onto this paper taking care to get the right information in the right column. This is done by using a cardboard ruler the length of the width of the paper, the four edges of which have been marked off to correspond with the data to be recorded under the four headings already mentioned.

Cards are punched from the manuscript coding sheets and are then ready to enter the machine. The first programme reads one card at a time (at 300 per minute), checks that the information that it contains is reasonable and if satisfied writes a facsimile of that card onto magnetic disc. Finally this programme will sort these records into the same order that the patient records appear in the master file.

The second programme accepts this checked and validated data from the magnetic disc and incorporates it into the master file of the practice which itself finally emerges as a reel of magnetic tape. Each record occupies about one centimetre of tape and each tape is long enough to hold about 10,000 records. These can be scanned in about five minutes.

The object of the exercise has been to create a workable simple system for use in the practice and to gain some familiarity with the up and coming world of the computer. The immediate task ahead is to complete the master tape by entering the contents of all the medical record envelopes. The next task is to obtain registers of the complete practice and to use them in a useful manner. The master file will also be suitable for statistical analysis in a number of ways. Its scope could be enlarged to include such things as surgery attendance, prescribing habits and medical, social, obstetric, family history. It has already been suggested that a map reference of the patient's home would be a worthwhile addition and this has been incorporated so that possible geographical influences on disease can be studied.

The system described above has been introduced and is now working in a second general practice and the possibilities of increased sophistication and the employment of ancillary help for locating and investigating areas of hidden morbidity are to be explored.

The ethical problems inherent in the preparation of a magnetic tape file have been considered and personal ownership of the tapes and programmes is a valuable safeguard to confidentiality. The complexity of the programmes is itself a protection. The material contained in manuscript in the medical record envelopes of the practice would be more readily understood by anyone with little conscience about breaking and entering the practice office.

Summary

A short description of the development of a very simple system for register maintenance in general practice using an ICL 1905 computer.

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PERSONAL POINTS OF VIEW

Retrieval of information from medical journals

DR D. D. BODLEY SCOTT

Hampshire

RETRIEVAL OF INFORMATION IS ONE OF the problems facing all of us. With the advances in all areas of medicine there is an increasing number of periodicals, both in specialist and general medical fields. The majority of doctors receive journals, and of these a variable number is read. We have probably all experienced difficulty in tracing references to recent journals.

If journal reference is required one can obtain this either from a journal to which one