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Using Computers in the NHS

The Long Term View.

An extrapolation of the ideas
conceived & executed by the
EXETER COMMUNITY HEALTH SERVICES COMPUTER PROJECT

J. SPARROW
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March 1976

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1. INTRODUCTION.

When considering how the Exeter systems, both operational and under development, which have been described elsewhere can be used for the long term future in the improvement of patient care then certain basic assumptions need to be made.

For the sake of organisational clarity and for an overall view of the patient the General Practitioner should act as the patient's 'health care manager'. Most other health care agencies are specialists who tend to see the patient in terms of the conditions with which the patient presents. As the agent of the patient the General Practitioner will organise other resources in the health service to suit best the clinical condition and social characteristics of that patient. Whilst this may be the ideal, one of the consequences is that the general clinical care received by the patient may be very much dependent on the knowledge, experience and conscientiousness of the General Practitioner. Because it was sometimes thought that general practice could not provide all the necessary care other systems have emerged operated by what used to be local authority doctors to fill the gaps which ideally should have been filled by general practice. These cover the areas of School Health, Vaccination and Immunisation, Pre-School Health and so on. In the age in which we live these systems are now becoming an excuse for the continued existence of medical care at primary level outside the control of the General Practitioner. It is in the interest of the patients that such a situation be reversed.

The factors which mitigate against the conscientious delivery of good health care by general practice are as follows:- poor premises, misunderstandings between General Practitioner and patient and poor records. The consequences of poor premises may be discomfort and inconvenience but they do not necessarily lead to a lowering in clinical care of the patient. Misunderstandings between General Practitioner and patient can be caused by differences of culture, class, region and language. In addition patients assume that information given to one doctor relating to their clinical care is passed on to another. To ensure that this does happen at General Practitioner level the GP relies on the record written by other General Practitioners. A record keeping system which allows quick and easy understanding of the previous medical history of the patient, which at the same time is easily maintained, is therefore of utmost importance. General Practitioners should be encouraged to keep records about their patients that are not only comprehensible to other General Practitioners but which give the opportunity and facility to review their own practice with the practice of their partners so that within a group or health centre General Practitioners achieve common understanding about the methods that they use.

The complete record keeping Computer System designed by the doctors at Ottery St. Mary in conjunction with the Exeter Community Health Services Computer Project satisfies all the above requirements. It is the only practicable system available in which General Practitioners can be kept informed about what is happening to the patient whether the patient is receiving the attention of health visitors, district nurses, social workers, or hospitals. This system is also the only available way whereby an individual practitioner can analyse the day to day management of his patients and compare his practices with the practices of his partners. It must be appreciated that the Exeter system is not 'just another way of keeping records', ie analogous to the proposed change to A4 stationery, but offers the opportunity to revolutionise the level and quality of care that is given to patients.

By making full use of the integration of the data (IPR) from multiple sources improvements in the quality and type of care at the general practice level can completely redefine the nature of the problem which hospitals have to solve. By further extending the communication of data between hospitals, in addition to between GP's, it should help to ensure that the best treatment is provided in the interests of the patient and the service generally. Elements of care taken away

from the general practitioner to be administered by others without full collaboration will lead to a fragmentation of care, a diffusion of responsibility, the confusion of the patient and waste of valuable and costly resources.

It must be remembered that the greater the number of agencies in the health service dealing directly with a patient the greater the organisational problems for the health service and the greater the confusion in the mind of the patient. Reorganisation of April 1974 was done from the point of view of the administrators rather than the point of view of the patient. By using computing techniques a correction to this policy is possible.

2. INTEGRATED RECORD.

The medical record in the form currently provided by the Department of Health and Social Security does not always promote an understanding between doctor and patient. This is why an integrated patient record has been developed using a computer. It has a number of separate components which need to be assembled in a logical order. It is not necessary to include all the components in order to arrive at a workable system. A record that will be useful in the management of patient care can be obtained by including almost any subset of the available components. Obviously the more complete the record the more useful it becomes.

The components currently developed, which are in daily use in the Exeter system, relevant to the system are shown below. Each component contributes to the centrally held integrated patient record.

Component

1. Patient Identity
2. Hospital Contacts
3. Priority medical details
4. Summary medical history including archives (hospital letters and reports)
5. Current episode(s)
6. Medication including Repeat Prescriptions
7. Social History
8. Obstetrics History
9. Family History
10. GP - Patient contact statistics

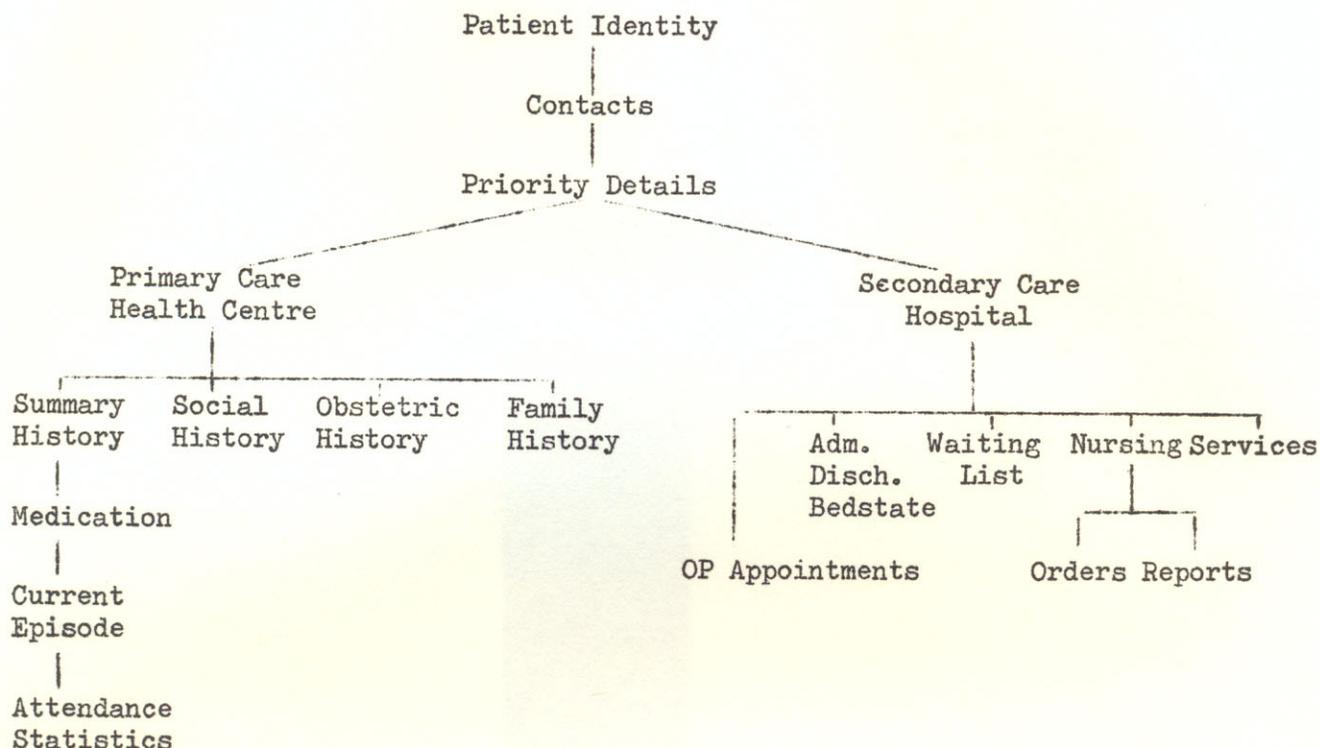
Items 1 and 2 are operational at two hospitals and two health centres. The remaining items are operational at one health centre and are being installed at a second.

Those components under development are:

1. Admission, Discharge, Bed state
2. Waiting List management
3. Nursing Orders
4. Nursing Reports
5. Service Department Applications (Path. Lab., X-ray)
6. Outpatient Appointments

Items 2 and 3 are already running in parallel with manual systems in one hospital.

The above components are linked in the following logical structure:



Given the patient identity it is possible to link directly Hospital and Community data in any way consistent with the pre-defined ethical and confidentiality rules. Each integrated patient record must have an identity section but all other components can be present in any combination.

3. COMPONENTS OF THE SYSTEM.

If the above components are gradually implemented in the order suggested by the tree structure they make a coherent record at any given stage. Moreover many of the components have uses outside the particular Health Centre or hospital at which the patient is registered.

(a) Patient Identity.

This data is repeated in many records currently held separately within the NHS.

i.e. FPC
Pre-School Child Health
Vaccination & Immunisation
Health Centre
Hospital Indices
School Health

In the current NHS organisation each individual record incurs or has incurred the full cost of set up and maintenance. The possibility of keeping the records in each of the separate locations up to date is remote. The Exeter system by using a single centrally held integrated records turns this remote possibility to a high probability.

(b) Priority Details.

This information is vital to any clinician caring for the patient. It also provides data for Handicap Registers, At risk Registers and Vaccination and Immunisation systems. In an ideal manual system these items of data should be duplicated, one copy being with the agency dealing with the patient (eg Hospital department) and the other copy with the General Practitioner. The attendant risks of error and inadequate information are obvious. For instance the General Practitioner is often unaware of whatever treatment is given to his patient.

(c) GP Medical Data.

This data is used in the day to day care of the patient by the GP but is also valuable to other health centre workers and hospital doctors when patients are referred to them. By making this information available a full medical history of the patient can be used by all providers of care which minimises the duplication of effort and helps establish the basis for giving the patient better care.

(d) Hospital Administrative Data.

This is primarily of use within the hospital to enable the Medical Records department to function efficiently. It could also be used by those outside the hospital to check on appointments, X-rays and contacts the patient has with the system. Through linking with the community this data is kept more up to date and is thus improved for management and research purposes.

(e) Hospital Medical Data.

This covers the range of activities of the nursing and service departments. Whilst essential to inpatient management a full record of care during a hospital stay can be of value to the after care of the patient in the community as well as for follow up outpatient and inpatient episodes.

4. USE OF THE RECORD.

Not only does the record consist of several different parts but the data can be used and maintained by many different people such as -

in Health Centre	in Hospital
1. General Practitioners	1. Doctors
2. Health Centre Receptionists	2. Nurses
3. Health Visitors	3. Medical Records Staff
4. Practice Nurses	4. Service Department Staff
5. District Nurses	
6. District Midwives	
7. Child Health Service Drs.	
8. Social Workers etc.	

Each person can contribute to the one central record and as necessary have controlled access to their own and other components. Access is a combination of one or more of the following actions: Read, Add, Delete, Summarise.

What the reader will realise is that the situation described above is complex, i.e. any of at least twelve types of person can, theoretically, do any combination of up to four actions on up to thirteen groups of data. This is not a function of the computer system but a reflection of the needs of the patient and the complex nature of the Health Service. This is what leads to the fragmentation of the current manual record system.

To produce order out of such chaos it is necessary to have an organisation based on the needs of the patients and a record keeping system to reinforce the organisation. As mentioned in the introduction the focal point for the organisational relationship between the patient and the Health Service is the General Practitioner. He should therefore be the focal point for any record keeping system. This puts considerable responsibility on the General Practitioner which many would argue he is at best ill equipped and at worse unwilling to carry. The computer system provides not only a better record keeping system but such records could be used to give an indication of the quality of care which could be kept under review by, say, Local Medical Committees; so that with the greater responsibility, aided by better facilities, would go more rigorous accountability.

The benefits of the computer system will be considerable even if no further thought is given as to how the NHS might best be organised to take advantage of the systems full potential. If we are to capitalise on the experience of the system gained so far in health centres and hospitals then the following ideas need to be explored in more depth.

(a) Delegation of work within Primary Care.

At present the GP tends to see all patients who turn up at the surgery. However many cases do not need the care of a doctor and could be seen equally well by a nurse. The patient may in fact prefer to see a nurse whose time the patient will feel is less 'precious'. If a good recording system is in use then the GP can leave a nurse to see most of his patients knowing that he can put reminders and recall dates into the system so that he can keep in touch.

(b) Individual definition of at-risk groups.

The GP can control his 'at-risk' registers by whatever factors are important in the area in which he practices, e.g. Ebbw Vale would have different risks to Budleigh Salterton. If one uses more of the skills that a GP was given in his training then the level of his expertise will tend to remain higher, the job satisfaction should be greater and one GP, because his skill is being concentrated where it is required could deal with many more patients.

(c) Communication between various branches of NHS.

The GP should be provided with accurate up to date information concerning all the treatment being given to his patient.

Full co-operation between GP and Consultants should be encouraged by the frank exchange of relevant clinical and administrative data.

(d) Population Coverage.

The population covered by the system should be as large as practical and covered as fully as possible.

5. IMPLEMENTATION.

To implement the above ideas more widely would mean:

STEP 1. Complete implementation of the full system as agreed at the second Health Centre and in the two hospitals.

- STEP 2. Take on the registry system of the Family Practitioner Committee thus increasing the effective population covered. The amount of development work would be small as the vast part of the system exists and has already been running for two years.
- STEP 3. Without further implementation it would then be a simple matter to supply all general practitioners in the Area with Age/Sex registers on a quarterly basis either on paper or on microfiche using existing batch programs operating on the real time data base.
- STEP 4. One could then begin to link Family Practitioners Committee records with hospital indices from other parts of Devon. This would require additional terminals in selected major hospitals in the Area and hospital indices would be provided on microfiche. The microfiche could contain the whole index or sub-sets of it broken down by hospital or hospital group as required. In this way the hospital indices would be kept more accurately up to date using the existing Family Practitioner Committee register.
- STEP 5. Two or three appropriately sited terminals would supply sufficient input capacity for the Devon Area Health Authority to add Child Health Record/Vaccination and Immunisation data to the existing Integrated Patient Records. This step could take place in parallel with step 4.
- STEP 6. The Family Practitioners Committee would provide an input service for those General Practitioners who wished some part of the system to be operational for their patients, e.g. to add priority medical details for their patients. These priority details could be output to microfiche so that for very little additional expense each practice could have a complete set of microfiche showing the most critical factors about each of their patients available anywhere all the time. GP's could also then receive information regularly relating to all 'at risk' patients and thus provide an improved follow up and surveillance system. Priority Details would also be available at all Accident and Emergency Departments in hospitals.
- STEP 7. By the time it is feasible to attempt step 7, which would be the addition of a complete system to new Health Centres and would involve the installation of terminals at Health Centres, the clinical economics of the system should be proved beyond doubt. In addition the demand for the whole system will be much clearer although current indications are that there are already a number of practices which would seriously consider going onto the Exeter system.

The advantage of the strategy described above is that no step prejudices the worth of a later step so that the implementation can be taken over as long or as short a period as would suit the requirements of the Area. Whilst it has been developed with a particular Area in mind there is no logistic reason why the same facilities should not be provided in other areas on existing or new equipment. The advantages of a full microfiche record system could be even more beneficial in the urban areas supplied with an on call locum for GP night and emergency calls.

6. SAVINGS AND CHANGE TO THE NHS.

The costs of setting up and running the first application groups were contained in the evaluation report dated November 1975. In creating the project from scratch certain basic groundwork was needed, which although costly in development, is now complete and building further components onto the system is relatively cheap.

We have already shown that to add new components to the health centre systems requires only a few months of systems and programming activity and of course once designed it is available to the complete population covered by the system. Extension to the FPC held records has also been shown to be practical since the patients at the second health centre were all registered on the system using the FPC index. Preliminary calculations indicate that the Computer Project could create and maintain an FPC registry system more cheaply than the current manual system (through staff savings) and cheaper than the National Standard batch system which is currently still at a development stage (eliminating duplication of effort and staff savings).

At present money is short in the NHS and obviously one must concentrate on utilising existing resources and expanding with the minimum of set up and capital costs. The staged programme proposed utilising the existing equipment with the addition of a few terminals would meet those criteria. Full exploitation of the one accurate and centrally held record for each patient should minimise maintenance costs and at the same time give more confidence in the use of the data for management purposes.

It must not be overlooked however that the main benefits of the system can only be achieved by the wider adoption and expansion of the system which initially requires substantial capital and revenue expenditure. Accepting that hospital treatment will remain a relatively high cost factor in the NHS, systems must be developed that ensure that the right patients are treated in the most optimum fashion. Without a good record system, at the primary level of care, which records all treatments and from which analysis can be done for individuals or for the community, it is difficult to see how the NHS can move from curative to preventative medicine. By tackling the symptoms earlier the most expensive part of the NHS treatment can be minimised and the total NHS expenditure can be contained if not reduced in total.

The introduction of such a system does mean some replanning of the delivery of health care in the NHS in the interests of the patients it serves.