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HOSPITAL MEDICAL RECORDS:
THE UNIT FILE IN CURRENT USE.

by

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A C K N O W L E D G E M E N T S.

This work has resulted from the study of hospital medical records undertaken by the Medical Records Research Group during the past $2\frac{1}{2}$ years, and I must thank collectively the many hundreds of people, both in this country and abroad, who have given us information, assistance and advice.

In particular, I welcome this opportunity of specially thanking Professor Bernard Lennox, who was responsible for forming the Group in the first instance, and whose constant efforts, advice and encouragement ever since have made the research venture a success.

I am also indebted to my own staff for their tireless support; to the Nuffield Provincial Hospitals Trust for their continuing financial help; Dr. H.R.L. Fraser for his help at all stages; Professor T.F. Paterson and his staff at the Department of Industrial Administration, Strathclyde University, for their generous hospitality and their advice on aspects of management and operational research; and Professor Thomas Anderson for lending us several offices for over a year in his Department of Epidemiology in Ruchill Hospital.

In addition, I wish to thank Drs. A.C. MacDonald, R.L. Richards and A.S. Rogen for encouraging and permitting me to continue to practise clinical medicine during this time.

Finally, I am indebted to Mrs. Eileen Douglas, Mrs. Elizabeth Elliot, Miss Joyce Grant, Mrs. Morag Lacey and Miss Jessica Nichol, for their careful typing of the final manuscript.

S U M M A R Y.

The "explosion" of scientific information in the last 3 decades has revolutionised medical and surgical treatment, but has, at the same time, increasingly strained the facilities of both medical scientific libraries and medical records departments. Patterns of illness have changed, and the case papers of individual patients now frequently relate to illnesses which last for many years. Unit files are becoming so bulky that their contents can neither be easily physically stored nor mentally assimilated. More patients and more knowledge about their illnesses result in more clerical work in wards and clinics, and this in turn slows the flow of information throughout the hospital.

In Chapter 1 the present situation is outlined, and it is suggested that major faults exist in the present system of making and keeping medical records. In Chapter 2 the term "operational research" is explained; application of this technique to problems of medical records is discussed. It is suggested that altering work routine may often be the best way of solving specific record problems, and that the facilities for making and keeping good medical records are the same as those necessary for good patient care. A model is described by means of which any hospital Unit may be surveyed in detail to define faults in the existing record system.

Two medical and two surgical Units are surveyed in detail

in Chapter 3 to illustrate the application of this model and to indicate common faults in present-day British hospitals. Some of these faults are discussed in more detail in Chapter 4, and an E.C.G. and an X-Ray department are surveyed to illustrate some of the problems of ancillary departments.

In Chapter 5 the arguments for and against centralising typing services are considered in detail, together with the question of how best to organise the non-typing duties of a secretary. It is concluded that Unit secretaries are too valuable members of clinical teams to be satisfactorily replaced by typing "pools".

The methods available for transporting documents are reviewed in Chapter 6 and it is concluded that, because in the foreseeable future "handraulic" methods (Payne, 1966) will continue to be used, adequate internal messenger services should be organised in all large hospitals. Some of the problems in making and handling laboratory records are considered in Chapter 7 by reference to a detailed survey of a radio-isotopes department.

In Chapter 8 the traditional systems of drug prescribing, administration and stock control in hospital wards are described and criticised. Two existing new systems are considered in detail: these involve drastic alteration of work routine and recording, and it is suggested that they should, together, be widely adopted.

An attempt is made in Chapter 9 to answer the classical question "What is meant by a good medical record?". It is concluded that, because a record is a means of communication, its efficiency

as such is an index of its quality.

Standardisation of format is discussed at some length in Chapter 10, both in general terms and in relation to specific documents, and it is pointed out that many of the problems of keeping case papers tidy in a unit file depend not on page format but on the binding mechanism used.

Future trends in administrative organisation and electronic equipment are reviewed in Chapter 11, and the potentials of computer-assisted diagnosis briefly discussed. Finally, in Chapter 12 it is concluded that present working conditions in many British hospitals are seriously prejudicing the making and keeping of good medical records, and that only detailed operational research can provide the necessary information about what exactly is at fault and what remedial measures should be taken.

A U T H O R ' S N O T E

In this thesis I have largely avoided considering the problems of the storage and retrieval of medical records, and the content of discharge letters relating to hospital in-patients, because I shall write an account of them in a separate work to be published elsewhere.

"As in the human body structure reflects function,
so within a Health Service records reflect organisation and
communications".

(Acheson, 1967)

CHAPTER ONE

P R E S E N T P R O B L E M S

"Our system of intelligence is adapted admirably to the short-term Trafalgar-like actions of the era of infective disease, but is inadequate for the diffuse and protracted struggle against chronic and hereditary disease."

(Acheson, 1967)

"Over the last three centuries the rate of publication of scientific papers has doubled every fifteen years."

(Lever, 1965)

The Information Explosion

In the thirty years since the advent of the sulphonamides, medical knowledge and achievement have far exceeded that gained in the previous five thousand years. The advances in medical investigations and therapeutics (see Table 1/1) have been made possible by, and have themselves helped to create a vast "information explosion" (Alexander, 1966).

Medical librarians throughout the world can barely cope with the flood of text books, monographs and learned journals, and the indexing of their contents: this is already well-known. What is not yet widely appreciated is that, with medical treatment now, at best, making more cures possible, and, at least, delaying death, sometimes indefinitely, the expansion of recorded information relating to this treatment has been enormous.

T A B L E 1/1

SOME ADVANCES IN MEDICAL TECHNIQUES IN RECENT YEARS

CHEMOTHERAPY	ANTI-INFECTIVE	e.g. against meningitis pneumonia tuberculosis
	PSYCHIATRIC	e.g. tranquillizers anti-depressives
	SYNTHETIC HORMONES	e.g. corticosteroids oral contraceptives
IMMUNISATION		e.g. against poliomyelitis
INTRAVENOUS FLUID THERAPY		e.g. blood; electrolytes; protein
ANAESTHESIA		e.g. deep hypothermia & hypotension
NEW MACHINERY TECHNIQUES		e.g. renal dialysis; cardiac pacing; cardio-pulmonary bypass; regional perfusion; stereotactic neurosurgery; arthroplasty; artificial limbs
TISSUE GRAFTING		e.g. renal; synthetic vascular prosthesis
NEW INVESTIGATIONS	FIBER-OPTIC	fiberoscopy
	ELECTRICAL	unipolar E.C.Gs.; vectorcardiography
	ULTRASONIC	e.g. in intracranial lateralisation
	RADIO WAVE	e.g. in intestinal motility studies
	RADIO-ISOTOPE	e.g. in endocrine function and mineral balance studies, and organ scanning

No longer are most illnesses separate self-contained episodes; more often each episode is simply a chapter in a long story of chronic or recurrent ill-health. Moreover, the dangers of iatrogenic morbidity are now such that it behoves an attending physician to become familiar with all relevant medical information, past as well as present, about his patient, if he is not to do positive harm rather than good.

Unit Files

Such considerations have led to the adoption in most U.K. hospitals of the "unit file" system. One patient has one file in a given hospital, and in it are housed all his medical records originating in that hospital (Kurtz, 1943). Enquiry by one department of another about his past illnesses is avoided, but enquiry is, of course, still necessary by one hospital of another. Now the idea is spreading of having a life-long unified personal medical record comprising all relevant information from the three branches of the National Health Service (Acheson, 1967).

This sounds promising until one considers the sheer bulk of paper involved. Already, in a unit file system less than fifteen years old, one encounters many files which are several inches thick. What, one wonders, will the situation be like in a few more years' time, and how, on this basis, could one possibly think in terms of a unit file lasting a patient's whole life-time, even if relevant to only one hospital ?

The storage space in hospitals is fast running out, and the difficulty of indexing and retrieving the records at present is a problem in itself. The records department must, by its very nature and function, be located somewhere near the centre of a hospital, and the master index must be at its own centre. The encroaching growth of a master index within a records department, and of a records department within a hospital is like that of a malignant neoplasm.

What, too, is the point of keeping such bulky files, when their contents are so untidy, diverse and often illegible as to make their assimilation by a clinician well-nigh impossible in any reasonable space of time ?

The Communications Barrier

There are two reasons for the bulk. Firstly, in the current records so much is written and kept initially, and secondly, and much more important, in past records so much is kept permanently. Unit files are bulky mainly because so much material is preserved in past records. The unit file system has defeated its own purpose within a few years, by presenting records officers on the one hand, and clinicians on the other, with a voluminous mass of unclassified information, much of which is useless. We have now reached a "communications barrier", which must, as a matter of urgency, be broken through.

The problem, however, does not end there. The communications barrier applies in other areas of hospital activity. Patients' investigation results take unduly long to arrive; discharge letters to general practitioners are sent weeks late; secretaries are too few, and are overworked, often in conditons which no commercial firm would tolerate (Ralston, 1967); this makes it hardly surprising that the general accuracy of typescript leaves much to be desired. The cost in doctors' and nurses' time spent on clerical procedures has been estimated at £17 million annually in England and Wales alone. (Acheson, 1967).

Such is the present situation. I suggest that major faults exist in the system of medical records, and I propose to consider various aspects of this system, identify the faults and suggest means of correcting them.

CHAPTER TWO

METHODS OF ENQUIRY

"At present, opinions on many aspects of medical work are far too often based only on personal experience and subjective judgments even although the techniques of operational research have now been developed to the point where quantitative studies could be made."

(Scottish Home & Health Dept., 1967)

Operational Research

This country is now at the start of a new Industrial Revolution. Competition in business and industry is increasingly severe, and costs, particularly of labour, are rising steeply, but these factors are offset by increasing mechanisation and by the use of automation, which is defined (Payne, 1966) as any machine system in which information is instrumented partially or completely for decision, adjustment, or control purposes.

Suitable machinery may necessitate great capital outlay and a complete review of existing methods and techniques, so we have the growing application of enquiries into present work processes, under the various names of operational research, work study, activity analysis, organisation and methods(O. & M), methods work, systems analysis and design, and network analysis. Indeed, with the advent of electronic computers, many of these terms are now being included in the concept of computer sciences (Institution of Computer Sciences, 1967).

General Principles.

Operational research is, in its sequence of steps, very similar to medical practice (see Table 2/1) although one is not accustomed to think in these terms. The analogy is even closer in that, if the first step is omitted in each sequence, the resulting operation is a routine examination designed to find faults which are not already apparent.

Three main dangers are always present in any operational research. Firstly, personnel in the system being observed may resent the presence of the observers and may make the research valueless through wilful non-co-operation, usually being under the impression that the research is aimed at proving the system is overstaffed. Secondly, observation, by interfering with the basic work routine, may itself alter the system and so invalidate observed results. Thirdly, the operational research personnel may be so ignorant of the type of system they are observing that they misinterpret their findings.

Until recently the third danger has been minimised by the fact that systems in business and commerce could be reduced to a common framework of description, so that an observer trained in the general techniques of operational research could equally well investigate the canteen of a power station and the stock control of a rubber factory. However, this is no longer true when a system is complex and highly technical as is, for example, hospital medical practice, so there is a new élite of operational research workers appearing, who are known as systems analysts, and who work in close collaboration with personnel employed in the situation under investigation. Such co-operation between internal personnel and outside

T A B L E 2/1

A COMPARISON OF OPERATIONAL RESEARCH AND MEDICAL PRACTICE

STEP	OPERATIONAL RESEARCH	MEDICAL PRACTICE
1	PROBLEM IDENTIFICATION	COMPLAINT
2	ENQUIRY INTO THE GENERAL SITUATION	HISTORY, PHYSICAL EXAMINATION & SPECIAL INVESTIGATIONS
3	DEFINITION OF THE FAULTS IN THE SYSTEM	DIAGNOSIS
4	MODIFICATION OF THE SYSTEM	TREATMENT

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systems analysts has been found to be essential in the introduction of automation techniques employing electronic computers (Payne, 1967).

The popular idea persists of an O. & M. observer following staff around, clicking a stop watch on and off. Measurements of activity times can be made in other more satisfactory ways, one of which, using bar-charts, I shall describe later. Another less well-known method is that of activity sampling.

Activity Sampling (Davies, 1965)

This is a technique in which a large number of instantaneous observations are made over a period of time of a group of machines, processes or workers. Each observation records what is happening at that instant, and the percentage of observations recorded for a particular activity or delay is a measure of the percentage of time during which that activity or delay occurs.

The theoretical basis of activity sampling is statistical sampling, which is widely used by market research agencies and in public opinion polls. In statistical quality control the quality of a batch can be inferred by examining in detail the dimensions, finish and other aspects of a small sample, whereas in activity sampling the time spent in various activities in a work situation is deduced from a comparatively small number of observations.

An essential requirement of activity sampling is that the observations are made entirely at random, and the best way to ensure this

is to number all the minutes (or seconds, as the case may be) of the whole observation period, and to select times by using a table of random numbers. The next step is to make a small number of observations to determine the approximate percentage of time taken by the activity in question, and then to calculate the number of observations necessary to establish the exact percentage of time by the formula:-

$$N = \frac{4P (100 - P)}{L^2}$$

where N is the number of observations required, P is the approximate percentage of time taken by the activity in question, and L is the percentage limit of accuracy considered acceptable.

Once N is known, further sufficient observations are made, and the exact percentage of time (P^1) taken by the activity in question is determined. The observer can be 95% certain that this figure is accurate within a range of $P^1 \pm L$.

Applications in Hospitals

Applications of these techniques in the Health Service have so far been very limited, although critical path programming, which originated with the Polaris project (Payne, 1966), is now being used in new hospital planning by the Western Regional Hospital Board (Brown, 1967).

The Muffield Provincial Hospitals Trust (1962 & 1965) has pioneered the use of operational research in the clinical environment, and the Ministry of Technology has already (1965 & 1966) made surveys in

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laboratory and general practice, but a contribution by the Ministry of Health (1966) has been singularly disappointing. So far no systematic attempt has been made to review comprehensively the activities of medical, nursing and secretarial staff within hospital wards and clinics, and this is, at first glance, surprising. On further consideration, there are three important reasons: (a) laymen cannot properly be permitted to be present during medical and surgical procedures on any, especially female, patients; (b) laymen do not understand medicine, anyway; and (c) very few nurses and doctors are familiar with or even much interested in the techniques of operational research.

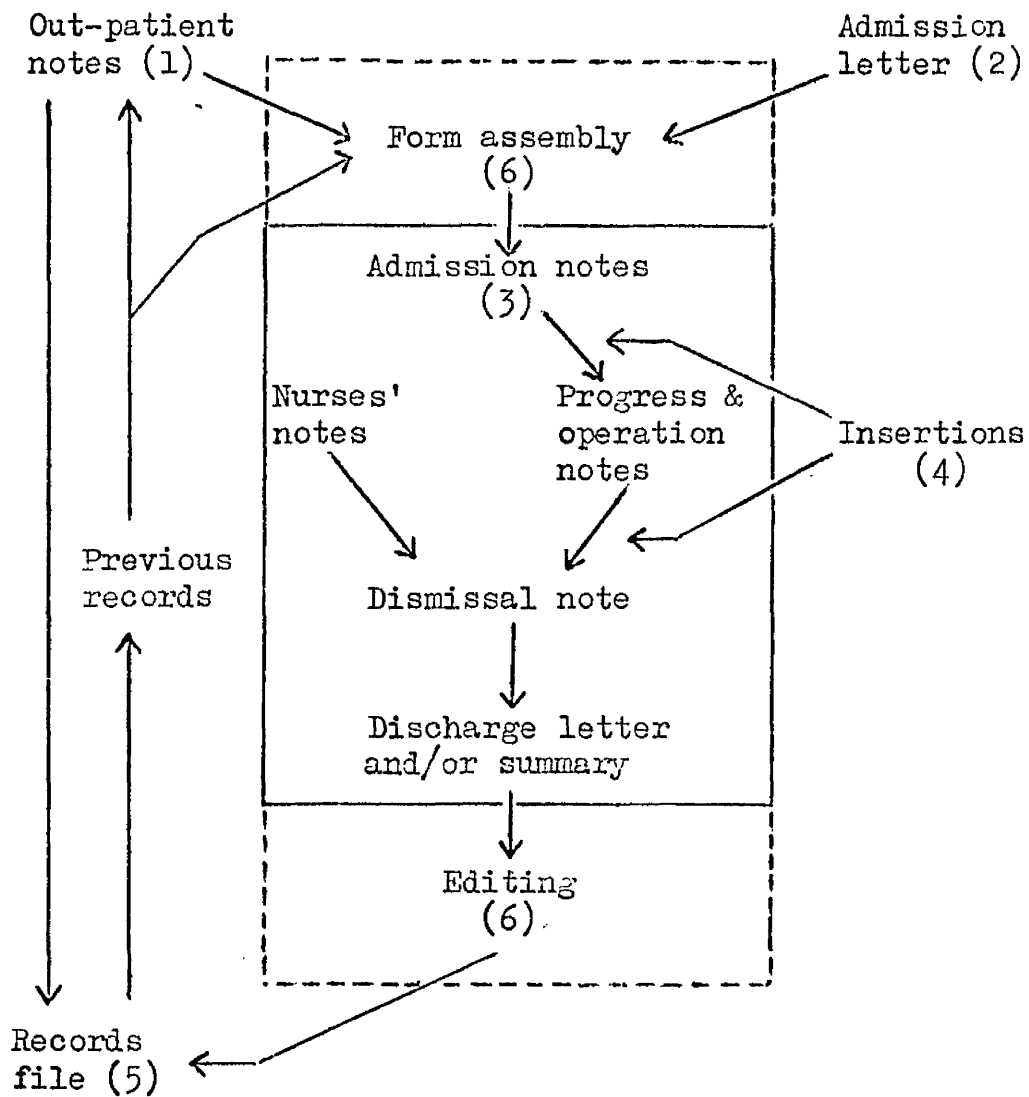
There is little in the medical literature to suggest methods of conducting operational research on medical records in use in wards and clinics, nor is there a useful analogous situation in a non-medical context, although the unit file system in the Criminal Record Office of New Scotland Yard presents similar problems in information storage and retrieval (Grout, 1967). I have, therefore, had to design my own survey methods, which I shall describe shortly.

The Life Cycle of Case Records

Before considering in detail the items which should be measured, let us look briefly at the life cycle of hospital medical records. An information flow-chart has recently been published (English Electric Leo-Marconi Computers, Ltd., 1967) to serve as a basis for further research, but it is too complicated for my present purposes, and the essential steps can be represented much more simply (Figure 2/1).

FIGURE 2/1

THE LIFE CYCLE OF HOSPITAL CASE RECORDS



- Locations:
- (1) Out-patient clinic.
 - (2) General practitioner, other hospital Unit, etc.
 - (3) Ward.
 - (4) Laboratories, etc.
 - (5) Records department.
 - (6) Records department or ward.

Three items in this diagram call for special comment: nurses' notes, dismissal note, and "insertions". Nurses' notes are usually, nowadays, made on loose leaf (e.g. "Kardex") pages, and include details (sometimes the only ones) of drug therapy. They are integrated with the medical unit file when the patient has left the ward, and, during his stay, the medical and nurses' notes are parallel information systems.

A "dismissal note" is a preliminary communication from the ward medical staff to the general practitioner when the patient leaves for home. The note may even be given to the patient to deliver, in which case, of course, he is tempted to unseal it and read it (Harrington, 1967). The document is justified by its often containing important information, such as current drug therapy; unfortunately its very sending tends to diminish the urgency of the subsequent detailed "discharge letter".

"Insertions" is a term I have used for the various reports, graphic and otherwise, which are incorporated into a unit file during a patient's stay in hospital, and which emanate from laboratories, X-Ray departments and so on.

All the faults in the present system of hospital medical records can be represented on my flow-chart in terms of (a) record design, content and speed of transmission, and (b) work routine. It will often be found that radical alteration of work routine is by far the best way to solve specific problems and increase efficiency.

The Survey Model

In any medical or surgical Unit in a hospital what items should be surveyed in order to define faults in the records system ? The list (Table 2/2) constitutes what became known by my own research group as the "survey model", and it will be seen that a great deal of the measurement must still remain qualitative, and, therefore, to some extent, at least, subjective.

When one considers in detail the factors affecting the making and keeping of hospital medical records, one finds one is considering most aspects of patient care. The facilities necessary for making and keeping good records are the same as those necessary for good patient care.

There is no typical hospital and no typical hospital Unit, but it might be possible to make some useful comparisons by conducting a large number of surveys, based on my model, and scoring the results on 80-column punch cards for computer analysis. The difficulties in such a method are very great, judging from some of my own findings; on the other hand, these illustrate important general patterns, and clearly define a number of specific system faults.

T A B L E 2/2

THE SURVEY MODEL

No.	(a) Essentially quantitative	(b) Partially qualitative
1	<u>Name of unit:-</u> Specialty	Geographical factors
2	<u>Work specification:-</u> Bed complement; out-patient clinics; teaching; research; ancillary departments; admission routine; waiting list for admissions	<u>Adequacy of premises:-</u> Space; furniture; lighting; heating; ward hand basins; diagnostic instruments; telephones; staff location devices; case record trolleys; X-Ray viewing boxes; personal labelling (patients & staff)
3	<u>Staff establishment:-</u> Medical; nursing & domestic; secretarial; other relevant	<u>Staff morale</u>
4	<u>In-patients' statistics:-</u> Patients per year; duration of stay; percentage of re-admissions for same or other conditions; diagnostic breakdown; death rate	
5	<u>Delivery of previous notes</u> from records department - how easy and how fast, including weekends and at night	Other aspects of the service to the wards and clinics by the records department
6	<u>Volume of case notes:-</u> (as lines and pages) of admission and progress notes, nurses' notes, out-patient notes	Document format; quality of notes

T A B L E 2/2 (Contd.)

No.	(a) Essentially quantitative	(b) Partially qualitative
7	<u>Volume of insertions:-</u> Time before results arrive back in ward or clinic	Document format; content of reports; care in their mounting in the file
8	<u>Discharge letter:-</u> Time to send; authorship; length (lines & pages); adequacy as a summary * <u>Operation notes:-</u> likewise	<u>Transfer procedure</u>
9	Time taken to edit the notes	Care in writing
10	<u>Out-patients:-</u> Waiting list; throughput per year & per clinic; length, authorship and delay in despatch of clinic letters	Clinic organisation; premises; equipment
11	<u>Secretarial services:-</u> Work load (with detailed breakdown); number of recording machines	Quality of secretarial work; any other factors affecting secretarial efficiency *

* I shall say more about these factors later.

CHAPTER THREE

FOUR UNIT SURVEYS

"Rarely are the views of staff sought, even in matters where they alone can give the information and advice required. Likewise, it is not customary to let them know about rebuilding plans, service aims or other matters of a similar nature."

(Hals, 1967)

The following survey reports have been revised to exclude superfluous material, to present some information more briefly in tabular form, and to ensure, where possible, individual anonymity; otherwise they remain as they were first written and circularised to the Units concerned.

Two ordinary Units were chosen, one medical and one surgical, for direct comparisons; they, in turn, were compared with a professorial medical and a professorial surgical Unit.

It should be noted that the term "typed lines" is hereafter applied to and measured as quarto lines of finally corrected text. Letter heading, salutations, etc., envelope texts, and re-typed items are not included.

I

SURVEY OF DR. RICHARDS' UNIT,
WESTERN INFIRMARY, GLASGOW..

JANUARY TO MARCH, 1966

M.R.R.G. REPORT NO. 2

First published: March, 1966.

Revised: October, 1967.

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1. UNIT CONCERNED

Dr. R.L. Richards' Unit of Internal Medicine - Wards C9 and 10, Western Infirmary, Glasgow.

2. LOCATION

On the third floor of the main Infirmary block, astride the through corridor.

3. UNIT STAFF

3.1. Medical

STATUS	NUMBER	OUR DESIGNATION HEREAFTER
CONSULTANT	3	DRS. AA ¹ , AB ² , AC ¹
SENIOR REGISTRAR	2	DRS. AD, AH ³
REGISTRAR	1	DR. AE
SENIOR HOUSE OFFICER	1	DR. AF
HOUSE PHYSICIAN	1	DR. AG

1. 9 sessions weekly.
2. 5 sessions weekly.
3. Non-N.H.S. Attached for postgraduate research.

3.1.1. In addition, there are usually 2 "intensive-term" medical students attached to the Unit for each University 10-week term, who do routine clinical clerking.

3.2. Nursing and Domestic

The following staff were present during 1 week of the survey:-

	WARD C9 (FEMALE)				WARD C10 (MALE)			
	DAY		NIGHT		DAY		NIGHT	
	FT	PT	FT	PT	FT	PT	FT	PT
SISTER	1	-	-	-	1	-	-	-
STAFF NURSE	1	1	-	-	-	-	-	-
SENIOR STUDENT NURSE	1*	-	1	$\frac{1}{2}\phi$	1*	-	1	$\frac{1}{2}\phi$
JUNIOR STUDENT NURSE	3*	-	1	-	3*	-	1	-
NURSING AUXILIARY	1	1	-	-	1	-	-	-
MAID	-	1	-	-	1	-	-	-

FT Full-time

PT Part-time

* Somewhat variable

ϕ On Receiving Nights only

3.2.1. Hours of Work

Day staff work between 8.00 a.m. and 8.30 p.m. (or, in fact, 8.45 p.m., to allow for an overlap with oncoming night staff).

3.2.2. Definitions

A Student Nurse is training to become a Registered General Nurse /, as opposed to a Pupil Nurse, who is training to become a State Enrolled Nurse \backslash . (Occasionally Pupil Nurses are employed in the Unit in addition to the persons already mentioned). A Senior Student Nurse is one who has undergone more than $1\frac{1}{2}$ years of the 3 years training course.

3.3. Secretarial

There is 1 Unit secretary, who works a statutory $37\frac{1}{2}$ hour week, and who is responsible for both in- and out-patient material.

/ R.G.N. in Scotland: S.R.N. is the equivalent qualification in England.

\backslash S.E.N.

4. WORK SPECIFICATION

4.1. Bed Complement

37 beds as follows:-

One male ward of 18 beds
One female ward of 18 beds
One side-room housing an artificial kidney

4.2. Out-patient Clinics

CLINIC	DAY & TIME	PHYSICIANS	APPROX. NO. OF PATIENTS
RENAL	MONDAY P.M.	DR. AD	14
ANTICOAGULANT	TUESDAY A.M.	DR. AF	Variable
GENERAL MEDICAL (new & return patients)	WEDNESDAY P.M.	DR. AA DR. AE	10
GENERAL MEDICAL (return patients)	FRIDAY A.M.	DR. AC DR. AF DR. AB DR. AE	67
GENERAL MEDICAL (new patients)	FRIDAY P.M.	DR. AC DR. AF	12
		DR. AB DR. AE	12

4.2.1. In addition, Dr. AA runs a Vascular Clinic on Thursday afternoons in conjunction with certain surgeons, but this is not directly connected with the Unit.

4.3. Teaching Commitments

Undergraduate and postgraduate.

4.4. Special Facilities

An artificial kidney. It is planned to merge this service with the Urological Department.

4.5. Admission of In-patients

All patients are admitted on Receiving Days which occur every fourth day, running through weekends. The day is specified as 8.00 a.m. to 8.00 a.m., and during this time the Senior House Officer, Registrar or Senior Registrar remains in the hospital till midnight routinely.

4.6. Extra Commitments

4.6.1. Bath Street Physiotherapy Clinic

Dr. AC	-	Monday afternoon
Dr. AF	-	Wednesday afternoon
Dr. AE	-	Thursday afternoon

4.6.2. Convalescent patients in Knightswood Hospital

Dr. AA		
or	-	Wednesday morning
Dr. AC		

5. ADEQUACY OF PREMISES

5.1. Telephone System

- 5.1.1. There are two systems in the hospital which are not interconnected: an internal system is operated by dial and an external system via the switchboard, and it is impossible to reach an external line from a dialling instrument. In the Unit corridor there are two external phones and one internal; in the staff room there is one of each. In the secretary's room there is an external instrument with an extension to Dr. Richards' inner office.
- 5.1.2. This situation operates throughout the hospital and is a major source of frustration and waste of time. What is urgently needed is a completely new telephone system and a PABX 3 or PABX 4 would be ideal in this respect. Such a system provides instruments with dials where the user may dial an internal number or an external number, the latter either through the operator or directly as preferred. The instruments also boast several switches so that the user may receive and hold an external call whilst himself making an internal call on his instrument, and so that the user may receive a call and himself transfer that call to another internal number.

5.2. Space

This is insufficient in several respects, viz:-

- a) The Unit secretary has no privacy and is short of table area and cupboard space. She sits with her back to the light because of the location of her telephone.
- b) Teaching space is inadequate.
- c) There is no special provision for interviewing patients' relatives.
- d) There is insufficient consulting room for out-patients (within the Unit).
- e) There are no patients' day rooms.

5.3. Lighting

This is quite inadequate throughout the hospital and all fittings should be of fluorescent strip type.

5.4. Ward Wash-hand Basins

At present there is only one wash-hand basin in each ward for the use of medical staff. This is quite inadequate by any reasonable standard and the number should be at least four or five in each ward.

5.5. Patient Labelling

No system exists at present, but there are strong grounds for advocating the use of plastic wristlet bands inscribed with each patient's name and hospital number, and, in addition, for mounting above each bed the patient's name on a card label. This latter practice is carried out in some Units of this hospital at present.

5.6. X-Ray Viewing Boxes

One single box in each ward. We feel that there should be a double box in each ward, and a double box in the staff room.

6. IN-PATIENTS' STATISTICS

	to 4/66	to 4/65	to 4/64	to 4/63
BED ESTABLISHMENT *	36	36	36	36
ADMISSIONS	954	977	1053	989
INTER-WARD TRANSFERS (IN)	82	84	117	148
DISCHARGES	766	776	904	844
INTER-WARD TRANSFERS (OUT)	145	158	133	150
DEATHS	129	136	129	142
AVERAGE LENGTH OF STAY (DAYS)	11.0	11.2	10.7	10.7

* Excluding the artificial kidney bed.

7. PREVIOUS RECORDS

7.1. In a sample of 50 case sheets relating to patients sequentially discharged recently from this Unit, 20 had previous Western Infirmary in-patient notes and, of these, 15 had notes relating to the same illness and 7 relating to another illness. The maximum number of previous in-patient episodes for any one patient was 5. There were, in all, 29 previous in-patient episodes for the same illness and 10 for other illnesses.

7.2. In the same sample of 50 case sheets the diagnostic breakdown, based on the present illness, was as follows:-

ALL MALIGNANT NEOPLASMS*	3
CARDIOVASCULAR DISEASE	25
PULMONARY DISEASE	2
PEPTIC ULCER	2
DRUG INTOXICATION (including alcohol & carbon monoxide)	7
RENAL DISEASE	2
DIABETES MELLITUS	5
BLOOD DYSCRASIAS	2
MISCELLANEOUS	<u>6</u>
	<u>54</u>

8 of these 50 patients died.

* All the following figures, except those for blood dyscrasias, are exclusive of malignant neoplasms.

8. PRESENT CASE SHEET

8.1. Volume of Notes

A breakdown of the same sample of 50 case sheets, in terms of lines/pages, showed:-

ADMISSION NOTES		PROGRESS NOTES		NURSES' NOTES	
AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES
76	157-14	20	233-0	37	222-3
3	6-1	1	10-0	3*	13-1

8.2. Quality of Notes

These notes seemed to be remarkably good and comprehensive.

8.3. Volume of Insertions

In the same sample of 50 case sheets the following insertions were present:-

DOCUMENT	AVERAGE PER CASE SHEET	EXTREMES
B.P. CHARTS	0.8	5 to nil
E.C.G. REPORTS	1.1	6 to "
X-RAY REPORTS	1.0	3 to "
PATHOLOGY REPORTS	0.6	1 to "
BACTERIOLOGY REPORTS	0.8	5 to "
BIOCHEMISTRY REPORTS	2.2	10 to "
HAEMATOLOGY REPORTS ϕ	2.4	13 to "
FLUID BALANCE CHARTS	1.8	14 to "
T.P.R. CHARTS	1.1	7 to "
AVERAGE LENGTH OF STAY	12.3 days \neq	47 to 1

* "Kardex" size (10" x 8") \neq See para 6

ϕ It should be noted that E.S.Rs. are estimated in the wards

8.4. Document Format

We are reserving comment on this subject meantime.

8.5. Care in Editing

8.5.1. This is fairly bad and to some extent inevitable in a hospital where there are so many page designs available for use in a case sheet. One reason is everyone's lack of time to take trouble over this apparently unimportant task, but the method of binding is also to blame. In particular we would criticise the method of processing E.C.G. documents*.

8.5.2. The average time taken to properly edit a case sheet, in a random sample of 12 newly returned to file, was 3 minutes, 30 seconds.

* See "Organisation of the E.C.G. Services of the Western Infirmary": M.R.R.G. Report No. 1.

9. TIME TAKEN TO COMPLETE INVESTIGATIONS

- 9.1. We carried out a short survey to assess the time interval between a request being sent from the ward for a particular laboratory investigation, X-Ray examination, or E.C.G., and the arrival back of the written report. In general, these time intervals were small and acceptable.
- 9.2. However, there was a delay of several weeks in obtaining barium meals, cholecystograms and I.V.Ps. for both in-patients and out-patients, particularly the latter.
- 9.3. Undue delays also occurred in the arrival of E.C.G. reports, which we have commented on elsewhere.*

* "Organisation of the E.C.G. Services of the Western Infirmary": M.R.R.G. Report No. 1.

10. DISCHARGE OF PATIENTS

10.1. Discharge Letters

From the same sample of 50 case sheets, we measured the length of the discharge letter and the time interval between the patient's discharge from the ward and the date on the letter heading. These were as follows:-

DOCTOR	NO. OF LETTERS	AV. NO. OF LINES IN EACH	EXTREMES IN LINES	AV. TIME INTERVAL PER LETTER (DAYS)	EXTREMES IN DAYS
AA	9	27.1	43 to 13	6.7	14 to 2
AB	4	8.3	12 to 5	6.0	7 to 5
AC	7	26.7	64 to 7	1.9	6 to -2*
AD	5	16.8	26 to 11	7.6	11 to 6
AE	13	19.1	38 to 3	8.7	18 to 5
AF	11	20.9	43 to 9	7.2	13 to 2
AH	1	9.0	-	33.0	-
TOTAL	50	20.5	64 to 3	5.2	33 to -2*

10.1.1. We strongly recommend that every discharge letter to a general practitioner be posted before the patient leaves the ward. A follow-up letter would, of course, be necessary in many instances, when further investigation reports came to hand, or when some unforeseen happening delayed the patient's discharge at the last moment.

10.2 Transfer Procedure

When a patient in the Western Infirmary is to be transferred, either to another ward or another hospital, the House Physician must personally enter the request for porters, etc., in a register in the Infirmary admission hall, before the patient will be moved. We feel that this requirement is ridiculous and should cease forthwith.

* Such a letter was sent 2 days before the patient was discharged.

11. OUT-PATIENTS

11.1. Yearly Throughput

	to 4/66	to 4/65	to 4/64	to 4/63
TOTAL OUT-PATIENTS/YEAR	4803	4952	4602	4682
NEW PATIENTS	1542	1630	1490	1201
RETURN PATIENTS	3261	3322	3112	3481

11.2 Waiting Lists

11.2.1. The waiting list for new out-patient appointments is approximately 1 week.

11.2.2. A patient for non-emergency care is admitted to the wards in 1 to 2 weeks. The Ward Sisters keep the waiting lists.

12. OUT-PATIENT CLINIC FACILITIES

12.1. Premises

These are inadequate, uncomfortable and cramped. There are no proper facilities for dealing with patients on wheel chairs or trolleys.

12.2. Avenue of Approach for New Patients

Each new patient reports at the window of the appointments office and is directed to sit in a particular batch of coloured chairs in the central hall. The nurse from the Clinic collects the appropriate case notes from the appointments office window, seeks out each relevant patient, takes him into the Clinic and weighs him. She tests his urine sample for routine chemistry and puts the case notes, plus his weight and urinalysis results, on the table for the physician's attention in the Clinic. Meanwhile the patient has been directed to sit in a small corridor adjacent to the Clinic rooms and he waits there to be called.

12.3. Comments

Apart from the lack of room generally, the following points are relevant:-

- a) The lighting is very poor at the weighing machine.
- b) There are no alarm bells to ensure E.S.Rs. being read at the right time.
- c) There may be delays in referring a patient to the X-Ray and the E.C.G. Departments because these have closed at lunch-time or in the latter part of the afternoon.
- d) A nurse has to phone in each instance for an ambulance and porters for a patient, and much time would be saved if some push-button signalling apparatus were installed.
- e) Again the lack of a messenger service is very relevant, especially as regards delivery of request cards to the Physiotherapy Department.
- f)/

12.3. Comments (contd.)

- f) There are too few telephones in the Clinic area.
- g) Sound proofing in the consulting and examination rooms is practically non-existent.
- h) There are no facilities for patients to hang up their clothes when undressing.

13. THE UNIT SECRETARY

13.1. Duties

- a) Typing in- and out-patient letters.
- b) Completing diagnostic index cards.
- c) Filing laboratory, etc., reports.
- d) Answering telephone calls.
- e) Making stationery requests.
- f) Arranging appointments for patients, by liaison with the Records Department.
- g) Dealing with waiting list correspondence.
- h) Miscellaneous duties at certain Out-Patient Clinics.
- i) Collection, preparation and distribution of staff mail.

13.2. Work Load

13.2.1. This fluctuates greatly from week to week. It is the usual practice at present to hold back out-patient case notes until all reports relating to a patient's consultation are available and then send 1 composite letter. We suspect that many more immediate letters would be dictated as interim reports were the present secretary not likely to be overwhelmed by the increased volume of typing work.

13.2.2. The typing load was assessed by 2 sample week analyses, as follows:-

FIRST WEEK (13.0 TYPING HOURS)

DOCTOR	IN-PATIENTS			OUT-PATIENTS			OTHER LETTERS		
	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER
AA	21	1	21.0	15	1	15.0	69	2	34.5
AB	-	-	-	-	-	-	-	-	-
AC	-	-	-	188	19	9.9	-	-	-
AE	-	-	-	23	1	23.0	-	-	-
AF	101	7	14.4	126	7	18.0	8	1	8.0
AD	-	-	-	34	5	6.8	6	1	6.0
AH	26	2	13.0	171	27	6.3	-	-	-
TOTAL	148	10	14.8	557	60	9.3	83	4	20.8

Overall total = 788 lines in 74 letters
= 10.6 lines in each (average)

SECOND WEEK (22.0 TYPING HOURS)

DOCTOR	IN-PATIENTS			OUT-PATIENTS			OTHER LETTERS		
	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER
AA	-	-	-	11	1	11.0	66	4	16.5
AB	-	-	-	137	13	10.5	3	1	3.0
AC	-	-	-	292	31	9.4	29	5	5.8
AE	17	1	17.0	268	33	8.1	14	1	14.0
AF	48	3	16.0	65	5	13.0	6	1	6.0
AD	124	4	31.0	16	2	8.0	-	-	-
AH	-	-	-	-	-	-	-	-	-
AJ*	-	-	-	256	14 ⁶	18.3	-	-	-
TOTAL	189	8	23.6	1045	99	10.6	118	12	9.8

Overall total = 1352 lines in 119 letters
= 11.4 lines in each (average)

* Dr. AJ.: Non-N.H.S. Senior Registrar - postgraduate research scholar.

⁶ All "immediate letters" - see para. 13.2.1.

13.3 Recording Equipment

There are 2 tape recorders in the Unit. 1 is used by the physicians for dictation, the other by the secretary for transcription.

13.4. The Secretary's Day

In one day, selected purely at random, the Unit secretary was occupied as follows:-

ACTIVITY	DURATION	
	Hrs.	Mins.
1. Typing	3	27
2. Shorthand dictation	-	22
3. Visiting other departments to fetch and deliver various documents	-	35
4. Telephone calls (in and out)	-	41
5. Other routine tasks, such as tracing various documents	-	36
6. Miscellaneous, including one tea-break of 15 minutes and various interruptions	1	49
TOTAL	7	30

13.4.1. Comment

On this day, typing occupied 46% of the total time, and the time spent on telephoning and messenger duties was significantly high. The high figure for miscellaneous items underlines the need for an audio-typist to be protected from routine interruptions.

13.5. Comment on Secretarial Duties in General

- 13.5.1. It is already apparent that secretarial services in this Unit are saturated, and that additional staff for this purpose is necessary. We tentatively suggest at this stage that the total staff required is 2 instead of 1, but the work load could also be lightened by the provision of more wide-spread tape recording facilities, especially in the Out-Patient Department, and by 1 of the 2 girls typing in a separate office in the Unit, geographically isolated from casual interruptions.
- 13.5.2. There are many advocates of centralising all typing work in a pool, but this presupposes an adequate messenger service for the transport of case notes and completed letters, and almost certainly necessitates a multi-channel input system through the hospital telephones. Such a scheme, moreover, ignores the fact that a great many of the Unit secretary's duties are concerned with matters other than typing, and that should she be withdrawn from the Unit at the same time as a central typing pool were instituted, her non-typing duties could not all be undertaken adequately by other staff such as ward clerks. The whole matter is very controversial, however, and we do not propose to pursue it further at this stage.

13.6. Mechanical Documentation

We strongly advocate the introduction of a labelling service throughout the hospital, such as is provided by the "Addressograph" system.

14. ACKNOWLEDGEMENTS

We wish to thank all members of the Infirmary staff, without whose coöperation this report could not have been written.

15. APPENDIX: RECORDS OF 1955 AND 1960

15.1. Introduction

The following data, obtained by sampling in-patient records of Wards C9 and 10 of 1955 and 1960 may be of interest. The samples were randomly selected from the whole of these calendar years.

15.2. Previous Records

15.2.1. 1960 Sample of 25 Case Sheets

6 had previous Western Infirmary in-patient notes, and, of these, 6 had previous notes relating to the same illness, and 1 to another illness. The maximum number of previous in-patient episodes for any 1 patient was 9. There were, in all, 25 previous in-patient episodes for the same illness, and 1 for another illness.

15.2.2. 1955 Sample of 25 Case Sheets

7 had previous Western Infirmary in-patient notes, and, of these, 4 had previous notes relating to the same illness, and 3 to other illnesses. The maximum number of previous in-patient episodes for any 1 patient was 1. There were, in all, 4 previous in-patient episodes for the same illness, and 3 for other illnesses.

15.2.3. Comment

These low figures must be considered in relation to the fact that the Records Department opened only in 1954, so that some patients possibly had documents relating to their previous illnesses which were not pulled forward from old files.

15.3. Diagnosis (present illness)

DIAGNOSIS	1960 sample	1955 sample
ALL MALIGNANT NEOPLASMS*	1	2
CARDIOVASCULAR DISEASE	11	10
PULMONARY DISEASE	2	1
PEPTIC ULCER	-	1
DRUG INTOXICATION (INCLUDING ALCOHOL AND CARBON MONOXIDE)	4	-
RENAL DISEASE	2	1
DIABETES MELLITUS	1	1
BLOOD DYSCRASIAS	1	1
HEPATIC DISEASE	-	2
MISCELLANEOUS	8	6
TOTAL DIAGNOSES	30	25
TOTAL PATIENTS	25	25
TOTAL DEATHS	6	7

* All the following figures, except those for blood dyscrasias, are exclusive of malignant neoplasms.

15.4. Volume of Notes

Expressed as lines/pages.

SAMPLE	ADMISSION NOTES		PROGRESS NOTES		NURSES' NOTES	
	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES
1955	68	113-21	8	53-0	ø	-
	3	5-1	1	3-0	-	-
1960	52	107-20	10	31-0	34	127-0
	3	5-1	1	2-0	2*	8-0

15.5 Volume of Insertions

DOCUMENT	AVERAGE PER CASE SHEET		EXTREMES	
	1960	1955	1960	1955
B.P. CHARTS	0.08	0.24	1 to 0	2 to 0
E.C.Gs.	0.80	0.44	3 to 0	4 to 0
X-RAY REPORTS	0.80	0.80	3 to 0	6 to 0
PATHOLOGY REPORTS	0.08	0.08	1 to 0	1 to 0
BACTERIOLOGY REPORTS	0.68	0.80	7 to 0	7 to 0
BIOCHEMISTRY REPORTS	1.20	0.32	10 to 0	4 to 0
HAEMATOLOGY REPORTS	0.80	0.04	7 to 0	1 to 0
FLUID BALANCE CHARTS	1.24	0.16	17 to 0	3 to 0
T.P.R. CHARTS	0.80	1.76	4 to 0	13 to 0

* "Kardex" size (10" x 8")

ø The "Kardex" system was not in operation in 1955, and nurses' notes were not integrated with the final case sheet.

15.6. Length of Patient's Stay

YEAR	SAMPLE	AVERAGE STAY IN DAYS	EXTREMES IN DAYS
1955	25 CASE SHEETS	18.0	66 to 1
1960	25 " "	16.4	51 to 1
1965*	50 " "	12.3	47 to 1

15.7. Discharge Letters

1955

Sample of 25 case sheets, of which 21 had discharge letters completed. The average discharge letter comprised 10.9 lines, and was despatched 2 days after the patient left the ward.

1960

Sample of 25 case sheets, of which 24 had discharge letters completed. The average discharge letter comprised 15.0 lines, and was despatched 5 days after the patient left the ward.

* See para. 8.3.

II

SURVEY OF MR. CLARK'S UNIT,
WESTERN INFIRMARY, GLASGOW

MARCH TO APRIL, 1966

M.R.R.G. REPORT NO. 7

First published: June, 1966.

Revised: October, 1967.

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1. UNIT CONCERNED

Mr. D.H. Clark's Unit of General Surgery, comprising Wards C3 and 4 in the Western Infirmary, Glasgow.

2. LOCATION

On the first floor of the main Infirmary block, astride the through corridor.

3. UNIT STAFF

3.1. Surgical

STATUS	NUMBER	OUR DESIGNATION HEREAFTER
CONSULTANT	3	DRS. ² BA ³ , BB ⁴ , BC ³
REGISTRAR	1	DR. BD
HOUSE SURGEON ¹	2	DRS. BE, BG.

1. See para. 4.7.
2. For simplicity, we have designated all surgeons, as well as physicians, "Dr."
3. 9 sessions weekly.
4. 9 sessions weekly, including work at the Royal Beatson Memorial Hospital and the Glasgow Homeopathic Hospital.

- 3.1.1. In addition, there are usually several "intensive-term" medical students attached to the Unit for each University 10-week term, who do routine clinical clerking.

3.2. Nursing and Domestic

The following staff were present during 1 week of the Survey, but it appears that the situation is usually fluid and, according to Sister, always unsatisfactory. Sister was in charge of both wards*. In addition, there were:-

3.2.1.

GRADE	WARD C3 (FEMALE)				WARD C4 (MALE)			
	DAY		NIGHT		DAY		NIGHT	
	FT.	PT.	FT.	PT.	FT.	PT.	FT.	PT.
STAFF NURSE	1	2	-	$\frac{1}{2}\phi$	1	1	-	$\frac{1}{2}\phi$
SENIOR STUDENT NURSE	-	-	1	-	1	-	1	-
JUNIOR STUDENT NURSE	2 ⁺	-	-	-	3	-	1	-
PUPIL NURSE	1	-	-	-	-	-	-	-
NURSING AUXILIARY	-	-	1	-	1	-	-	-
NURSING ORDERLY	1	-	-	-	-	-	-	-
MAID	1	-	-	-	1	1	-	-

FT. Full-time. ϕ On Receiving Nights only.

PT. Part-time. ⁺ Plus one Student seconded from Mental Nursing.

3.2.2. Day Staff in Theatre

- 1 Sister and 1 Staff Nurse
- 1 Student Nurse
- 1 Male Orderly

* Immediately after this Survey, the permanent establishment was altered so that 1 Sister was in charge of C3 and another of C4.

3.2.3. Night Staff in Theatre

Only the Theatre of the Receiving Unit is staffed at night, as follows:-

- 1 Sister or Staff Nurse
- 1 Student Nurse
- 1 Orderly

3.2.4. Hours of Work

Day staff work between 8.00 a.m. and 8.30 p.m. (or, in fact, 8.45 p.m. to allow for an overlap with oncoming night staff).

3.3. Secretarial

There is 1 Unit secretary, who works a statutory $37\frac{1}{2}$ hour week and is responsible for all in- and out-patient material.

4. WORK SPECIFICATION

4.1. Bed Complement

42 beds, as follows:-

One male ward of 18 beds
One female ward of 18 beds
Two 3-bedded side-rooms

4.2. Out-Patient Clinics

All out-patients, new and return, are seen in the Out-Patient Department on Wednesday mornings, as follows:-

Dr. BA: 14 new patients and 10 returns
Dr. BB: 15 new patients and 10 returns
Dr. BC: 11 new patients and 10 returns

In addition, a total of some 30 patients, who were recently in-patients, are also seen at each Clinic.

4.3. Routine Theatre Sessions

Monday, Tuesday, Thursday and Friday mornings.

For major procedures a Consultant is chief operator; for minor procedures, such as haemorrhoids and herniorrhaphies, the Registrar frequently takes his place.

4.4. Routine Admissions

Daily except Saturday, Sunday and Receiving Days. The Ward Sister keeps the waiting list, and arranges for patients to be admitted 1 or 2 days before their planned operations.

4.5. Receiving Day

Every fifth day, running through weekends. Only emergency patients are, in fact, admitted on these days, so the term "Receiving Day" is misleading. As the Registrar happens to be resident in the hospital, he is always available during these 24 hours which are specified as from 8.00 a.m. to 8.00 a.m. He will either, himself, operate as necessary, or call in one of the Consultants if a more major problem is involved.

4.6. Teaching Commitments

Undergraduate and postgraduate.

4.7. Extra Commitments

Each House Surgeon is seconded for 5 to 6 weeks of his 6-month term, to staff the Casualty Department of the Infirmary. During this time 2 such House Surgeons (from the Infirmary rota) work alternate 24-hour shifts. On his alternate days away from the Casualty Department, the House Surgeon has no commitments at all in his parent Unit, so that, in effect, for some 3 months of every 6 the Unit has only 1 House Surgeon.

5. STAFF MORALE

- 5.1. Staff relationships within the Unit seem remarkably good. However, the Ward Sister did specify certain matters which caused extra work and considerable frustration and irritation.
- 5.2. There is continual difficulty in staffing wards sufficiently with nurses from week to week, and sometimes even from day to day. This situation is becoming increasingly common throughout the country and is highly dangerous to the patients' welfare.
- 5.3. Even more difficult is the ability to obtain extra nurses at short notice to cope with emergency situations.
- 5.4. Sister herself, because of the general nursing shortage, has to undertake general nursing duties in addition to her other work.
- 5.5. Frequently orders for supplies to the C.S.S.D.* and the Pharmacy Department are met neither promptly or accurately.
- 5.6. Friction with the Records Department exists for all the reasons described elsewhere.ø
- 5.7. There is no mail forwarding service in the Infirmary. Re-addressing mail should not devolve upon the Ward Sister or her staff. We suggest that the Records Department could easily undertake this work.

* Central Sterile Supply Department.

ø See "Survey of Professor Wayne's Unit", M.R.R.G. Report No. 3.

6. ADEQUACY OF PREMISES

6.1. Telephone System

The telephones in the Unit are as follows:-

Each ward corridor	has	1 external phone
Staff room	-	1 external
Resident's room	-	1 external
Sister's office	-	1 internal
Unit secretary	-	1 internal (long since broken) and 1 external (with an extension to Theatre)

6.2. Staff Location Devices

An excellent system exists for junior medical staff at present, with pocket radio receivers. Insufficient frequencies apparently exist to make receivers available to all senior staff who wish them. We feel that this situation should be urgently remedied.

6.3. Space

6.3.1. The Unit secretary works in a sideroom which also serves as an occasional laboratory. Her table, shelf and cupboard space are meagre.

6.3.2. There is only 1 staff room in the whole Unit, and Mr. Clark does not have a personal office.

6.3.3. There is insufficient teaching space.

6.3.4. There is no special provision for interviewing patients' relatives.

6.3.5. There is no patients' day room.

6.4. Lighting

The hospital lighting as a whole is very poor. All fittings should be of fluorescent strip type and we note that a start to this conversion has already been made in various wards.

6.5. Ward Wash-Hand Basins

For surgical staff there is at present 1 wash-hand basin in each main ward area, and none in the siderooms. These numbers are quite inadequate; there should be at least 4 basins in each main ward, and 1 in each sideroom.

6.6. X-Ray Viewing Boxes.

In the area of Wards C3 and 4 there is only 1 (single) X-Ray viewing box. Double boxes should be supplied for each ward, and for the test-room in C3 corridor.

6.7. Patient Labelling

6.7.1. Bedside labelling of patients does not exist. Patients in Theatre are labelled with adhesive plaster strips marked with their names; these strips are removed immediately after operation.

6.7.2. The Medical Defence Union and similar bodies have already repeatedly stressed the desirability of adequate patient labelling in a surgical Unit. Bedside labelling should also be adopted as in Professor Wayne's wards.

7. IN-PATIENTS' STATISTICS

	to 4/66	to 4/65	to 4/64	to 4/63
BED ESTABLISHMENT	42	42	42	42
ADMISSIONS	1262	1239	1188	1181
INTER-WARD TRANSFERS IN	46	34	40	36
DISCHARGES	1195	1170	1108	1132
INTER-WARD TRANSFERS OUT	45	70	78	56
DEATHS	48	52	45	36
AVERAGE LENGTH OF STAY (DAYS)	9.8	10.1	10.3	10.9

8. PREVIOUS RECORDS

8.1. In a sample of 50 case sheets, relating to patients sequentially discharged recently from this Unit, 24 had previous Western Infirmary in-patient notes and, of these, 9 had notes relating to the same illness, and 15 to another illness. The maximum number of in-patient episodes for any 1 patient was 4. There were, in all, 12 previous in-patient episodes for the same illness, and 22 for other illnesses.

8.2. In the same sample of 50 case sheets, the diagnostic breakdown (based on the present illness) was as follows:-

ALL MALIGNANT NEOPLASMS*	4
PEPTIC ULCER	4
GALL-BLADDER DISEASE	3
APPENDICITIS	4
HERNIAS	8
(INTESTINAL, UMBILICAL AND INCISIONAL, BUT NOT HIATUS)	
INTESTINAL OBSTRUCTIONS (EXCEPT FROM HERNIAS)	3
ANO-RECTAL DISEASE	4
HEAD INJURY	4
THYROID DISEASE	3
RENAL DISEASE	2
PROSTATE DISEASE	2
VARICOSE VEINS	3
MISCELLANEOUS	<u>9</u>
	<u>53</u>

2 of these 50 patients died.

* All the following figures are exclusive of malignant neoplasms.

8.3. In the same sample of 50 case sheets, the operation breakdown was as follows:-

VARIOUS HERNIA REPAIRS (<u>NOT</u> HIATUS HERNIA)	8
VARICOSE VEIN LIGATION/STRIPPING	3
THYROIDECTOMY	3
APPENDICECTOMY	3
CHOLECYSTECTOMY	2
VAGOTOMY AND PYLOROPLASTY	2
GASTRECTOMY	NIL
HAEMORRHOIDECTOMY	1
SIGMOIDOSCOPY	3
OTHER INTESTINAL SURGERY	3
SUPERFICIAL LESIONS*	6
MISCELLANEOUS ^ø	<u>5</u>
	<u>32</u>

* Wound suture, tissue biopsy,
tissue excision, abscess drainage.

^ø Including laparotomies.

9. PRESENT CASE SHEET

9.1. Volume of Notes

A breakdown of the same sample of 50 case sheets, in terms of lines/pages showed:-

ADMISSION NOTES		PROGRESS NOTES		NURSES' NOTES	
AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES
38	66-6	14	96-0	34	114-5
2	3-1	1	4-0	2*	7-1

9.2. Quality of Notes

These notes seemed to be of good quality. Surgical notes are usually more succinct than medical ones, and this is to be encouraged, provided, of course, that all essential information is, in fact, entered.

9.3. Volume of Insertions

In the same sample of 50 case sheets, the following insertions were present:-

DOCUMENT	AVERAGE PER CASE SHEET	EXTREMES
B.P. CHARTS	0.06	2 to nil
DIABETIC URINE CHARTS	0.02	1 to nil
ANAESTHETIC RECORDS	0.68	2 to nil
E.C.G. REPORTS	0.24	4 to nil
X-RAY REPORTS	0.64	3 to nil
PATHOLOGY REPORTS	0.32	2 to nil
BACTERIOLOGY REPORTS	0.66	7 to nil
HAEMATOLOGY REPORTS	1.88	10 to nil
BIOCHEMISTRY REPORTS	0.96	6 to nil
FLUID BALANCE CHARTS	0.46	5 to nil
T.P.R. CHARTS	0.66	2 to nil

Average length of stay = 8.4 days: extremes of 27 and 1: see para. 7.

* "Kardex" size (10" x 8")

Ø It should be noted that E.S.Rs. are estimated in the wards.

9.4. Document Format

We are reserving comments on this subject until the White Paper on Standardisation of Case Records in Scotland is published shortly.

9.5. Care in Editing

9.5.1. This is fairly good in this Unit, but many case sheets are inflated with unused extra pages, mainly for laboratory reports.

9.5.2. The average time taken to properly edit a case sheet, in a random sample of 12 newly returned to file, was 1 minute 23 seconds.

10. TIME TAKEN TO COMPLETE INVESTIGATIONS

- 10.1. Undue delays often occur in the reporting of E.C.Gs., and sometimes in the reporting of tissue biopsies. As regards the latter, delays may be due to the specimen having to be scrutinised by several histologists before a firm report can properly be issued.
- 10.2. There is now a delay of from 6 to 8 weeks in obtaining barium meals, I.V.Ps. and cholecystograms for out-patients, which we consider deplorable. The reason is the serious shortage of both space and radiographers in the X-Ray Department, a situation which is becoming steadily worse and to which the attention of the Board of Management has been repeatedly drawn over the past few years by the Radiologist-in-charge.*

* See "Survey of the X-Ray Department, Western Infirmary"
M.R.R.G. Report No. 6.

11. OPERATION NOTES

11.1. Surgeons' notes of operation procedures in this Unit are usually dictated and typed very soon after the operation itself, and a copy of the typed notes is sent to the general practitioner at this time. When the notes are not dictated and typed directly after the operation, they are added to the sheet of paper bearing the normal discharge letter to the general practitioner.

11.2. In the same sample of 50 case sheets, 33 had operation notes as follows:-

DOCTOR	NUMBER OF OPERATION NOTES	AVERAGE NUMBER OF LINES IN EACH	EXTREMES IN LINES
BA	3	12.3	27 to 5
BB	6	5.0	10 to 2
BC	5	6.0	13 to 2
BD	2	15.5	19 to 12
BH ¹	16	6.7	16 to 3
BJ ²	1	8.0	-
TOTAL	33	6.9	27 to 2

1. Registrar prior to Dr. BD.
2. Registrar prior to Dr. BH.

12. DISCHARGE OF PATIENTS

12.1. Discharge Letters

From the same sample of 50 case sheets, we measured the length of the discharge letter and the time interval between the patient's discharge from the ward and the date on the letter heading. These were as follows:-

DOCTOR	NO. OF LETTERS	AV. NO. OF LINES IN EACH	EXTREMES IN LINES	AV. TIME INTERVAL PER LETTER (DAYS)	EXTREMES IN DAYS
BA	3	4.3	6 to 3	4.7	7 to 2
BB	6	5.2	10 to 4	3.7	5 to 1
BC	4	7.0	9 to 4	4.5	8 to 1
BD	6	6.8	9 to 6	4.7	7 to 2
BH ¹	23	6.6	14 to 4	4.3	32*to 1
BJ ²	3	8.7	12 to 5	3.3	4 to 3
BK ³	1	7.0	-	3.0	-
TOTAL	46 ϕ	6.4	14 to 3	4.2	32*to 1

1. Registrar prior to Dr. BD.

2. Registrar prior to Dr. BH.

3. Formerly House Surgeon.

* 32 days delay in 1 instance, where the discharge letter was not sent until the patient returned to the O.P. Clinic.

ϕ In addition to these, 3 patients were transferred to medical wards and 1 case sheet had no discharge letter

12.2. Transfer Procedure

When a patient in the Western Infirmary is to be transferred either to another ward or another hospital, the House Surgeon must personally enter the request for porters, etc., in a register in the hospital admission hall before the patient will be moved. We feel that this requirement is ridiculous and should cease forthwith.

13. OUT-PATIENTS

13.1. Yearly Throughput

	to 4/66	to 4/65	to 4/64	to 4/63
TOTAL OUT-PATIENTS PER YEAR	4843	4623	4947	6342
NEW OUT-PATIENTS	1581	1399	1387	1170
RETURN OUT-PATIENTS	3262	3224	3560	5172

13.2. Waiting Lists

13.2.1. The waiting list for new out-patient appointments is approximately 2 weeks.

13.2.2. As far as admission to the wards is concerned, a patient suspected of having a carcinoma is admitted without delay; one for routine surgery is admitted after an interval of 3 to 4 weeks. In the latter case, the admission is planned in conjunction with the composing of theatre lists and is the responsibility of the Ward Sister (See para. 4.4.)

13.2.3. We feel that these arrangements for admitting in-patients from the waiting list are excellent.

14. THE UNIT SECRETARY

14.1. Duties

These include:-

- a) Typing in- and out-patient letters.
- b) Completing diagnostic index cards.
- c) Filing laboratory, etc., reports.
- d) Answering telephone calls.
- e) Making stationery indents.
- f) Arranging appointments for out-patients, by liaison with the Records Department.
- g) Dealing with waiting list correspondence.
- h) Miscellaneous duties at the weekly Out-Patient Clinic.
- i) Collection, preparation and distribution of staff mail.

14.2. Work Load

14.2.1. This fluctuates greatly from week to week. It is the usual practice at present to send a letter to the general practitioner immediately after a patient's consultation at the Clinic, and to send a follow-up letter when any reports pertaining to investigations made at this consultation come to hand. This is a deliberate policy designed to keep the general practitioner fully up-to-date with his patient's progress, and is, we feel, to be thoroughly recommended.

14.2.2. Work load of typing was assessed by 1 sample week analysis, as follows:-

14.2.2. (Contd.)

DOCTOR	IN-PATIENT LETTERS			OUT-PATIENT LETTERS			OPERATION NOTES		
	LINES	LETTERS	AV. LINES PER LETTER	LINES	LETTERS	AV. LINES PER LETTER	LINES	LETTERS	AV. LINES PER LETTER
BA	22	4	5.5	20	1	20.0	18	1	18.0
BB	-	-	-	71	7	10.1	40	5	8.0
BC	35	3	11.7	260	34	7.6	47	6	7.8
BL*	-	-	-	70	8	8.8	-	-	-
BG	16	1	16.0	62	10	6.2	-	-	-
BE	14	1	14.0	13	1	13.0	-	-	-
TOTAL	87	9	9.7	496	61	8.1	105	12	8.8

There were no other types of letter.

Overall total = 688 lines in 82 letters
= 8.4 lines in each (average)

* Registrar from another Unit, who was helping on that particular occasion.

14.3. The Secretary's Day

One 5-day working week of the secretary was analysed for details of her various activities, and a notional $7\frac{1}{2}$ hour day's work was obtained as follows:-

ACTIVITY	DURATION IN NOTIONAL DAY		EXTREMES IN SAMPLE WORKING WEEK			
	Hrs.	Min.	Hrs.	Min.	Hrs.	Min.
1. Attendance at O.P. Clinic	0	48	4	00*	-	-
2. Typing	2	26	4	25 to	1	25
3. Shorthand dictation	0	52	1	35 to	0	15
4. Filing case sheets, lab. reports, etc., and completing diagnostic index cards	2	5	3	45 to	-	-
5. Visiting other departments to fetch and deliver various documents	0	17	0	30 to	0	10
6. Miscellaneous, including tea breaks, 'phone calls, tracing case sheets and preparing mail	1	2		-		
TOTAL	7	30		-		

14.3.1. Comment

In this notional day, typing alone occupies 32% of the total time, and typing plus shorthand 44%. This serves to emphasise that a Unit secretary is not simply a typist. On the other hand, we suggest that her valuable time could be usefully saved by instituting a messenger service, and by delegating her duties at Out-Patient Clinics to a receptionist, such as is employed in some other Clinics in the Infirmary. Also, the full use of tape recorders would save much of the time she spends taking dictation.

* Represents attendance at the Wednesday morning O.P. Clinic.

14.4. Recording Equipment

There is 1 tape recorder in the Unit. This is obviously insufficient, and we suggest there should be at least 2 machines for dictation purposes, 1 of them being in Theatre, and a third recorder for transcription by the secretary.

15. ACKNOWLEDGEMENTS

We wish to thank all members of the Infirmary staff, without whose coöperation this report could not have been written.

16. APPENDIX: RECORDS OF 1955 and 1960

16.1. Introduction

The following data, obtained from sampling in-patient records of Wards C3 and 4 of 1955 and 1960 may be of interest. The samples were randomly selected from the whole of these calendar years.

16.2. Previous Records

16.2.1. 1960 Sample of 25 Case Sheets

11 had previous Western Infirmary in-patient notes, and of these, 7 had notes relating to the same illness and 4 to another illness. The maximum number of previous in-patient episodes for any 1 patient was 2. There were, in all, 10 previous in-patient episodes for the same illness and 7 for another illness.

16.2.2. 1955 Sample of 25 Case Sheets

1 had previous Western Infirmary in-patient notes, and these related to 1 previous admission for the same illness.

16.2.3. Comment

These low figures must be considered in relation to the fact that the Records Department opened only in 1954, so that some patients possibly had documents relating to their previous illnesses which were not pulled forward from old files.

16.3. Diagnosis (present illness)

/DIAGNOSIS	1960 sample	1955 sample
ALL MALIGNANT NEOPLASMS*	4	4
PEPTIC ULCER	-	5
GALL-BLADDER DISEASE	1	1
APPENDICITIS	3	2
HERNIAS (INTESTINAL, UMBILICAL AND INCISIONAL, BUT NOT HIATUS)	3	-
INTESTINAL OBSTRUCTIONS (EXCEPT FROM HERNIAS)	1	-
ANO-RECTAL DISEASE	-	-
NON-SPECIFIC ABDOMINAL UPSET	4	4
HEAD INJURY	2	2
THYROID DISEASE	-	-
RENAL DISEASE	1	-
PROSTATE DISEASE	-	-
VARICOSE VEINS	-	-
MISCELLANEOUS	7	7
TOTAL DIAGNOSES	26	25
TOTAL PATIENTS	25	25
TOTAL DEATHS	-	1

* All the following figures are exclusive of malignant neoplasms.

16.4. Operations

OPERATION	1960 sample	1955 sample
VARIOUS HERNIA REPAIRS (NOT HIA-TUS HERNIA)	2	-
APPENDICECTOMY	4	2
CHOLECYSTECTOMY	1	-
SIMPLE REPAIR OF PERFORATED PEPTIC ULCER	-	2
GASTRO-ENTEROSTOMY	-	2
GASTRECTOMY	-	1
MASTECTOMY	1	1
SUPERFICIAL LESIONS	4*	7 ϕ
MISCELLANEOUS	4 \nearrow	1 \nearrow
TOTAL	16	16

* Tissue excision, abscess drainage and aspiration of haematoma.

ϕ Tissue excision, abscess drainage and wound toilet and suture.

\nearrow Including laparotomies.

\nearrow A laparotomy.

16.5. Volume of Notes

Expressed as lines/pages

SAMPLE	ADMSSION NOTES		PROGRESS NOTES		NURSES' NOTES	
	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES
1955	31 2	45-5 2-1	6 1	34-0 2-0	Ø -	- -
1960	27 2	51-6 2-1	7 1	27-1 2-1	25 2*	98-1 6-1

16.6. Volume of Insertions

DOCUMENT	AVERAGE PER CASE SHEET		EXTREMES	
	1960	1955	1960	1955
B.P. CHARTS	-	-	-	-
ANAESTHETIC RECORDS	0.64	-	3 to 0	-
E.C.Gs.	-	0.04	-	1 to 0
X-RAY REPORTS	1.04	0.60	5 to 0	3 to 0
PATHOLOGY REPORTS	0.24	0.24	2 to 0	1 to 0
BACTERIOLOGY REPORTS	0.64	0.20	4 to 0	1 to 0
BIOCHEMISTRY REPORTS	0.12	0.04	1 to 0	1 to 0
HAEMATOLOGY REPORTS	0.44	0.04	2 to 0	1 to 0
FLUID BALANCE CHARTS	0.12	0.08	3 to 0	2 to 0
T.P.R. CHARTS	1.36	1.20	3 to 0	3 to 0

* "Kardex" size (10" x 8")

Ø The "Kardex" system was not in operation in 1955 and nurses' notes were not integrated with the final case sheet.

16.7. Length of Patient's Stay

YEAR	SAMPLE	AVERAGE STAY IN DAYS	EXTREMES IN DAYS
1955	25 CASE SHEETS	10.0	25 to 1
1960	25 CASE SHEETS	15.6	50 to 1
1965	50 CASE SHEETS*	8.4	27 to 1

16.8. Discharge Letters and Operation Notes1955

Sample of 25 case sheets, of which 23 had discharge letters completed and 16 had operation notes completed. Average operation notes comprised 6.3 lines. Average discharge letter comprised 13.8 lines, and was despatched 7 days after the patient left the ward.

1960

Sample of 25 case sheets, of which all had discharge letters completed and 14 had operation notes completed. Average operation notes comprised 9.9 lines. Average discharge letter comprised 10.8 lines, and was despatched 11 days after the patient left the ward.

* See para. 9.3.

III

SURVEY OF PROFESSOR WAYNE'S UNIT,
WESTERN INFIRMARY, GLASGOW

FEBRUARY TO MARCH, 1966

M.R.R.G. REPORT NO. 3

First published: April, 1966

Revised: October, 1967

FOREWORD

In this report we have partly abandoned our usual practice of keeping all individuals anonymous. This is because much of our detailed work later was concerned with this Unit: code identification of staff members applied throughout all our reports would have been excessively tedious for the reader, and applied inconsistently would not have preserved anonymity. We have, however, kept the use of personal names to the necessary minimum.

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1. UNIT CONCERNED

Professor Sir Edward Wayne's Unit of Internal Medicine, comprising Wards D3 and 4 and the Gardiner Institute of Medicine, Western Infirmary, Glasgow.

2. LOCATION

On the first floor of the main Infirmary block at the western end of the through corridor.

Wards D3 and 4 and the Gardiner Institute beds are all on this floor, but the offices of the Gardiner Institute are located on the floor below, and the Institute as a whole occupies several storeys.

3. UNIT STAFF

3.1. Medical

3.1.1. The majority of the medical staff are employed by the University of Glasgow, either in teaching grades or in research appointments; the others hold N.H.S. salaried appointments. Only the equivalent grade in the N.H.S. is usually specified hereafter.

3.1.2./

3.1.2. The medical staff is divided into 4 Teams for the purposes of in-patient and research work as follows:-

TEAM SPECIALISING IN	STATUS	NUMBER	OUR DESIGNATION HEREAFTER
CALCIUM METABOLISM	CONSULTANT	1	SIR EDWARD J. WAYNE *
	SENIOR REGISTRAR	1	DR. D.A.S. SMITH [⌘]
	REGISTRAR	2	DR. CA; DR. R.M. HARDEN ^δ
HAEMATOLOGY	CONSULTANT	1	DR. A. GOLDBERG [/]
	REGISTRAR	2	DR. CB AND 1 VACANCY
	SENIOR HOUSE OFFICER	1	DR. CC
ENDOCRINOLOGY	CONSULTANT	1	DR. W.D. ALEXANDER [√]
	SENIOR REGISTRAR	1	DR. CD
	SENIOR HOUSE OFFICER	2	DRS. CE, CF
CARDIOLOGY	CONSULTANT	1	DR. A.J.V. CAMERON [/]
	SENIOR REGISTRAR	1	DR. CG
	REGISTRAR	1	DR. CH
	SENIOR HOUSE OFFICER	1	DR. CI

* Regius Professor of the Practice of Medicine.

^δ N.H.S. Registrar, who also works in the Radio-Isotopes Department of the Infirmary.

[/] Reader in Medicine.

[√] Senior Lecturer in Medicine and Consultant-in-charge of the Radio-Isotopes Department.

[/] Whole-time N.H.S. Consultant Physician.

[⌘] Lecturer in Medicine.

3.1.3. The Unit has 2 House Physicians in all; each is responsible to 2 Teams, and, in practice, personally joins each of the 2 Teams on alternate days for ward rounds.

3.1.4. In addition, there are usually several "intensive-term" medical students attached to the Unit for each University 10-week term, who do routine clinical clerking.

3.2. Nursing and Domestic

The following staff were present during 1 week of the survey:-

GRADE	WARD D3 (FEMALE)				WARD D4 (MALE)				GARDINER INSTITUTE			
	DAY		NIGHT		DAY		NIGHT		DAY		NIGHT	
	FT.	PT.	FT.	PT.	FT.	PT.	FT.	PT.	FT.	PT.	FT.	PT.
SISTER	1	-	-	-	1	-	-	-	1	-	-	-
STAFF NURSE	1	-	1*	-	1	-	1*	-	1	-	1*	-
STUDENT NURSE	$\frac{4}{5}$	-	1 ϕ	-	$\frac{3}{4}$	-	1 ϕ	-	$\frac{1}{2}$	-	-	-
STATE ENROLLED NURSE	-	-	-	-	-	-	-	-	-	1	-	/
NURSING AUXILIARY	1	-	-	-	1	-	-	-	-	1	-	-
NURSING ORDERLY	1	-	-	-	-	-	-	-	1	-	-	-
MAID	1	-	-	-	2	-	-	-	-	2	-	-

FT: Full-time

/ = or

PT: Part-time

* or Senior Student Nurse

ϕ Junior Student Nurse or Nursing Auxiliary

/ On Receiving Nights it may be possible to draw from a hospital "float" of 3 part-time State Enrolled Nurses.

N.B. On Receiving Nights only, 1 extra member of nursing staff may be available in each ward.

3.2.1. Hours of Work

Day staff work between 8.00 a.m. and 8.30 p.m.(or, in fact, 8.45 p.m. to allow for an overlap with oncoming night staff).

3.2.2. Extra Nursing Commitments in the Gardiner Institute

3.2.2.1. If a patient is moved for treatment to the oxygen pressure chamber, which is in another part of the hospital, a nurse must accompany him.

3.2.2.2. Some patients with recent myocardial infarction are treated in the Gardiner Institute with what are currently called "intensive-care measures". These make extra demands on the nursing staff.

3.3. Secretarial

3.3.1. Wards D3 and 4

3 Unit secretaries; on the staff of the N.H.S.

3.3.2. Gardiner Institute

3 full-time and 1 part-time personal secretaries, plus 1 librarian; all University staff. Their various duties and accommodation will be considered in detail later (see paras. 5 and 13).

4. WORK SPECIFICATION

4.1. Bed Complement

The "official complement" is 55 beds. The actual total is 58, made up as follows:-

4.1.1. Ward D3 (Female)

22 beds in main ward plus 1 2-bedded sideroom = 24

4.1.2. Ward D4 (Male)

16 beds in main ward plus 1 4-bedded sideroom = 20

4.1.3. Gardiner Institute

4 2-bedded rooms plus 1 single plus 1 5-bedded room = 14

4.2./

4.2. Out-Patient Clinics

CLINIC	DAY AND TIME	DOCTORS	APPROX. NO. OF PATIENTS
GENERAL MEDICAL (NEW PATIENTS)	MONDAY A.M.	GOLDBERG, HARDEN, CB, CC*	9
		ALEXANDER, SMITH, CA, CE, CF	8
		CAMERON, CD, CG, CH, CI	6
GENERAL MEDICAL (RETURN PATIENTS)	MONDAY P.M.	GOLDBERG, ETC.	25
		ALEXANDER, ETC.	43
		CAMERON, ETC.	25
RENAL ϕ	ALTERNATE MONDAYS P.M.	SMITH, CA	10
MALABSORPTION ϕ	ALTERNATE MONDAYS P.M.	SMITH, CA, AE ∇	10
HAEMATOLOGY ϕ	TUESDAY P.M.	GOLDBERG, CB, CF*	28
ANTICOAGULANT	WEDNESDAY A.M.	CH, CI	VARIABLE
CARDIAC	WEDNESDAY A.M.	CAMERON, CG, CH, CI	40
ENDOCRINE ϕ	THURSDAY A.M.	ALEXANDER, HARDEN, CD, CE, CF ∇	40
BONE ϕ	FRIDAY A.M.	SMITH, CA	25
THYROID ϕ	FRIDAY P.M.	AS FOR ENDOCRINE CLINIC	40

* Plus the Registrar whose post in the Haematology Team is currently vacant. (See para 3.1.2.)

ϕ See para. 4.3.2.

∇ Registrar in Dr. Richards' Unit.

∇ Plus 1 postgraduate research scholar.

4.3. Document Organisation

- 4.3.1. Patients of the Gardiner Institute have, in certain instances, special case sheets, in addition to their hospital case sheets, in which are recorded data of research interest. These special case sheets are stored on the premises and are quite separate from the central records system of the main hospital.
- 4.3.2. All the out-patient clinics' appointments are managed by the staff of the Records Department, but the clinics marked ϕ in para. 4.2. are regarded, by virtue of their having at least begun as research projects, as still being entirely so, and therefore within the realm of the Gardiner Institute.
- 4.3.3. These Gardiner Institute Clinics are "second-stage" in the sense that a new patient at any of them has generally either been first seen at a general medical or surgical clinic at this or some other hospital, or is or has been an in-patient of a general medical or surgical Unit. Patients are not generally accepted on direct referral from a general practitioner.
- 4.3.4. Letters relating to these clinics are typed in the Gardiner Institute (see para. 13.1.2).

4.4. Teaching Commitments

Undergraduate and postgraduate.

4.5. Special Facilities

- 4.5.1. The Cardiac Department of the Infirmary is in direct charge of Dr. Cameron, and includes the E.C.G. services. These latter are housed on the ground floor of the hospital and are the subject of a special report by us.*
- 4.5.2. In the Gardiner Institute, there are, among other things, a Radio-Isotopes Department (see para. 15) and cardiac resuscitation and monitoring equipment; also easy access to the oxygen pressure chamber in the hospital. The Institute as a whole is the centre of a large amount of medical research over a wide range of subjects.

* "Organisation of the E.C.G. Services of the Western Infirmary": M.R.R.G. Report No. 1.

4.6. Admission of In-Patients

4.6.1. Wards D3 and 4

Emergency admissions are accepted on official Receiving Days, i.e. every fourth day running through weekends. Routine admissions (i.e. "cold" or "arranged" cases), however, are usually admitted on the day before each official Receiving Day.

4.6.2. Gardiner Institute

The in-patients here, particularly those on chemical balance studies, may be kept for months rather than weeks. Because of this slow turnover, new in-patients tend to be admitted on any day.

4.6.3. Responsibility of Care

4.6.3.1. Receiving Day is specified as 8.00 a.m. to 8.00 a.m., and during this time a Senior Registrar, Registrar or Senior House Officer remains in the hospital at least until midnight routinely.

4.6.3.2. The duty rotas for emergency receiving duties, including the Consultants on call, tend to fall into line with the Unit Medical Teams, although the Cardiac Team is, to some extent, relieved of such duties because of other commitments.

4.6.3.3. A patient admitted as an emergency case, therefore, tends to come under the care of a particular Team from the moment he or she enters hospital. Continued care as an in-patient will then be given by that Team, unless the situation is better served by an inter-Team transfer of the patient, as, for example, someone with an obscure blood disorder being admitted by chance by the Endocrine Team, and being later transferred to Dr. Goldberg's Team.

4.7. Extra Commitments

4.7.1. Bath Street Clinic - A Registrar rota operates for this throughout the hospital

4.7.2. Knightswood Hospital - Dr. Cameron regularly visits patients in Ward 2 (22 beds).

4.7.3. Queen Mother's Maternity Hospital - A Cardiac Clinic every Friday afternoon is attended by Dr. Cameron and Dr. CH. Medical consultations at all times are available via Dr. Cameron and Dr. CH.

4.8. Comments on Work Specification

- 4.8.1. It can be seen at once that the organisation in the Unit as a whole is exceedingly complex. There are, in a Unit of this size, obvious advantages in organising specialist services by way of Teams, in that research is encouraged and facilitated, and patients thereby benefit.
- 4.8.2. On the other hand, there is a very serious danger that such an organisation will become so unwieldy as to be inefficient, and we note in this respect that each Team, together with its secretarial staff, is usually very ignorant of the details of the activities of another Team and, what is even more disturbing, is often ignorant of who actually are members of that other Team and the posts they hold. We found that our information had constantly to be checked, cross-checked and double-checked.
- 4.8.3. We noted also that the morale among the E.C.G. technicians was very poor, and that this seemed to be due to friction between the supervisor and her junior staff. The turnover of the latter has been notably high in recent years.

5. ADEQUACY OF PREMISES

5.1. Telephone System

There are 2 systems in the hospital which are not inter-connected: an internal system is operated by dial and an external system via the switchboard, and it is impossible to reach an external line from a dialling instrument.

5.1.1. Telephones - Wards D3 and 4

Each ward corridor has 1 internal and 1 external 'phone.

Dr. Cameron's office - 1 external.

Dr. CG's office - an extension from the external in D4 corridor.

House Physicians' offices - 1 portable extension and 2 plug-in points.

Secretaries' room on D3 corridor - 1 external.

(2 of the ward secretaries are housed here; the third has an office in the E.C.G. premises on the ground floor, and that office has no telephone, so she must use the main E.C.G. telephone).

5.1.2. Telephones in the Gardiner Institute

Outside the diet kitchen (main corridor) - 1 external.

Adjacent to the nursing station - 1 external and 1 internal.

Dr. Goldberg's secretary - 1 external with an extension to Dr. Goldberg's office.

Dr. Alexander's secretary - 1 external with 1 extension to Dr. Harden's office and 1 to Dr. Alexander's office.

Dr. CB's office - 1 external.

Librarian - 1 external.

Dr. Alexander's office - 1 external, as well as the extension noted above.

5.1.2. Telephones in the Gardiner Institute (Contd.)

Dr. CD's office - 1 external.

Professor Wayne's secretary - 1 external with an extension to Professor Wayne's office, plus 1 external direct line with a similar extension, plus 1 internal.

Professor Wayne's office, in addition, has an internal 'phone.

5.1.3. Comments

In the ward area of D3 and 4 the number of instruments is too few. At least there should be a telephone for each secretary and for each House Physician, and Dr. CG's office should have a telephone directly linked to the switchboard.

5.2. Space and Equipment in Ward Areas

5.2.1. The 2 Unit secretaries housed on the ward corridor share a small office with a minimum of working space, cupboards and table tops.

5.2.2. The third Unit secretary is housed in the E.C.G premises on the ground floor of the hospital, simply because no other office space exists for her. Her better office facilities are more than offset by her inconvenient location.

5.2.3. There is insufficient teaching space.

5.2.4. There is no special provision for interviewing patients' relatives.

5.2.5. The patients' day room, which houses a T.V. set, can only be described as appalling as regards size, decoration and outlook. It is also used for much of the day as a students' class room.

5.2.6. The ward dirty linen is stored either on the ward verandahs, when the weather is dry, or in the ward entrance lobby, when it is raining. Both practices are to be deplored.

5.2.7. The ward drug cupboards are, apart from the D.D.A. container, prominent, glass-fronted and unlocked. If patients may sometimes jump out of windows, they will more likely raid a drug store which is displayed openly.

5.2.8./

5.2. Space and Equipment in Ward Areas (Contd.)

- 5.2.8. Ward D3 is presently under reconstruction with a view to general upgrading of all fittings. (The patients from here are in Knightswood Hospital temporarily).

5.3. Space and Equipment in the Gardiner Institute

- 5.3.1. The slunge is unduly small and houses the main refrigerator.
- 5.3.2. There is virtually no cupboard space, and delicate and expensive cardiac apparatus lies about on odd flat surfaces, gathering dust and inviting accidental damage.
- 5.3.3. The tilting gears of both cardiac beds have long been broken.
- 5.3.4. There is only 1 patient trolley.
- 5.3.5. There is no case sheet trolley and no diagnostic set.
- 5.3.6. There is only 1 bath for 14 patients.
- 5.3.7. There is insufficient shelf, cupboard and table space in the secretaries' offices.
- 5.3.8. There is, however, a small patients' day room with armchairs; and there is an efficient audio-visual signalling system.

5.4. Lighting

The hospital lighting as a whole is very poor. All fittings should be of fluorescent strip type and we note that a start to this conversion has already been made in various wards.

5.5. Ward Wash-Hand Basins

For medical staff there are at present 2 wash-hand basins in Ward D3 and 1 in Ward D4. In the Gardiner Institute there are 3 basins in the bed areas and 1 in the nursing station. These numbers are quite inadequate by any reasonable standard.

5.6. Noise in the Gardiner Institute

This is excessive for 2 reasons:-

- a) The floor is of concrete or similar material.
- b) The staircase and corridor are used as a main route for through traffic, including visitors.

5.7. Patient Labelling

In Wards D3 and 4 there is excellent bedside labelling, comprising the names of the patient, the attending physician in charge, his chief assistant, and the House Physician. No personal labels are worn by patients.

5.8. X-Ray Viewing Boxes

There is a double box in each ward.

6. IN-PATIENTS' STATISTICS

	to 4/66	to 4/65	to 4/64	to 4/63
BED ESTABLISHMENT*	55	55	55	55
ADMISSIONS	1255	1270	1241	1179
INTER-WARD TRANSFERS IN	202	209	186	188
DISCHARGES	1160	1152	1127	1058
INTER-WARD TRANSFERS OUT	199	202	187	193
DEATHS	123	125	117	114
AVERAGE LENGTH OF STAY (DAYS)	11.8	12.4	13.6	14.2

* These official figures are inclusive of Wards D3 and 4 and the Gardiner Institute, but ignore the fact that the latter true bed total is 3 over "official complement" (see para.4.1.3.).

7. THE RECORDS DEPARTMENT

- 7.1. As already noted, some Gardiner Institute records are stored separately from the others in hospital (see para. 4.3.1.).
- 7.2. Nevertheless, the statistics for the Infirmary, which are compiled by the Records Department, include the in- and out-patients of the Gardiner Institute.
- 7.3. The unit file system in the Infirmary was started in 1954.
- 7.4. The Records Department is in the Infirmary basement and is manned from 8.30 a.m. to 6.00 p.m. on Monday to Friday; from 8.30 a.m. to 12.30 p.m. on Saturday; and from 9.00 a.m. to 12.30 p.m. on Sunday. At other times, access can be obtained by means of a key kept at the porters' desk in the hospital admission hall.
- 7.5. Apart from the storing of medical records, the Records Department also attend to the following:-
- a) Appointments and reception for out-patients.
 - b) Compiling statistics regarding in- and out-patients, including a diagnostic and operation index.
 - c) Compiling morbidity returns for the Scottish Home and Health Department.
 - d) Compiling Cancer Registration returns.
 - e) Arranging for the supply of surgical appliances.
 - f) Refunding patients' travelling expenses
 - g) In addition, the Chief Records Officer is in charge of all Unit secretaries and various departmental clerks (e.g. X-Ray)
- 7.6. Records Department staff on location in the Department comprise:-
- 1 Chief Records Officer plus
 - 2 Higher Clerical Officers plus
 - 19 Clerical Officers.

7.7. Delivery of Records to the Wards

From a short survey we found that, on weekdays, previous case records were usually delivered to the wards within 24 hours of being requested, and could be obtained faster if urgently requested.

- 7.7.1. This delay could be reduced by instituting a general messenger service in the hospital, which is badly needed for many purposes.

7.8. Relations between the Records Department and the Units

- 7.8.1. We note that there is a considerable amount of friction between the records staff on the one hand, and medical and nursing staff on the other. Topics of dispute are numerous, but the following are some specific examples:-

- 7.8.2. Strong allegations are made by the records staff that the medical staff retain case sheets unduly long, which delays the completion of morbidity returns, and delays the return of the record to file. We feel that it cannot be overstressed that case sheets do not exist simply to be filed away. We suggest that the main reasons for the undoubtedly long retention of case sheets at ward level, after the in-patient's discharge or the out-patient's recent visit, are the insufficiency of secretarial facilities for dealing with medical correspondence, plus the slow turnover of investigations for out-patients, notably in the X-Ray Department.

- 7.8.3. Requests for an increase in the numbers of Unit secretaries, and for their replacement in holiday or sickness periods, are directed to the Records Department. Such requests are seldom properly satisfied from the medical staff's point of view.

- 7.8.4. The appointments lists for an out-patient clinic should be arranged or altered entirely to meet the wishes of the physician in charge of that clinic. Our enquiries of the medical staff suggest that these wishes are by no means fully or promptly met.

- 7.8.5./

7.8. Relations between the Records Department and the Units (Contd.)

7.8.5. If a patient is admitted to a ward at night, and for some reason his personal details cannot be obtained, the records staff 'phone for these details to the ward immediately the Records Department opens next morning. This is the busiest time in a ward, and, considering that only 1 medical, 1 general surgical, and the orthopaedic Unit are involved in much emergency admitting over any single 24 hours, it seems reasonable that obtaining this clerical information should be the responsibility of a member of the records staff who should personally visit the ward for this purpose.

7.8.6. The handwriting of the records staff is not infrequently illegible. When this illegible writing records the patient's name and address, and his general practitioner's name and address on the case sheet frontispiece, a great deal of annoyance and inconvenience is subsequently caused to various members of Unit staff.

8. PREVIOUS RECORDS

- 8.1. In a sample of 50 case sheets relating to patients sequentially discharged recently from the whole Unit, 25 had previous Western Infirmary in-patient notes, and, of these, 17 had notes relating to the same illness and 12 relating to another illness. The maximum number of in-patient episodes for any 1 patient was 19. There were, in all, 83 previous in-patient episodes for the same illness, and 13 for other illnesses.
- 8.2. In the same sample of 50 case-sheets, the diagnostic breakdown (based on the present illness) was as follows:-

ALL MALIGNANT NEOPLASMS*	2
CARDIO-VASCULAR DISEASE	24
PULMONARY DISEASE	-
PEPTIC ULCER	1
DRUG INTOXICATION (INCLUDING ALCOHOL AND CARBON MONOXIDE)	8
RENAL DISEASE	1
DIABETES MELLITUS	4
BLOOD DYSCRASIAS	5
PSYCHONEUROSIS	2
MISCELLANEOUS	<u>6</u>
	<u>53</u>

7 of these 50 patients died.

* All the following figures, except those for blood dyscrasias, are exclusive of malignant neoplasms.

9. PRESENT CASE SHEET

9.1. Volume of Notes

A breakdown of the same sample of 50 case sheets, in terms of lines/ pages, showed:-

ADMISSION NOTES		PROGRESS NOTES		NURSES' NOTES	
AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES
33	141-5	62	164-0	27	122-0
2	6-1	3	6-0	2*	9-0

9.2. Quality of Notes

These notes seemed to be remarkably good and comprehensive.

9.3. Volume of Insertions

In the same sample of 50 case sheets, the following insertions were present:-

DOCUMENT	AVERAGE PER CASE SHEET	EXTREMES
B.P. CHARTS	0.4	4 to nil
DIABETIC URINE CHARTS	0.08	2 to nil
ANAESTHETIC RECORDS	0.02	1 to nil
ACID-BASE NOMOGRAMS	0.02	1 to nil
E.C.G. REPORTS	1.2	7 to nil
X-RAY REPORTS	0.72	3 to nil
PATHOLOGY REPORTS	0.14	4 to nil
BACTERIOLOGY REPORTS	1.08	6 to nil
BIOCHEMISTRY REPORTS	2.2.	16 to nil
HAEMATOLOGY REPORTS ϕ	1.98	12 to nil
FLUID BALANCE CHARTS	0.34	7 to nil
T.P.R. CHARTS	1.98	10 to nil

Average length of stay = 8.7 days (extremes of 49 and 1: see para. 6)

* "Kardex" size (10" x 8")

ϕ It should be noted that E.S.Rs. are estimated in the wards.

9.4. Document Format

The Tunbridge Report has been published recently in England and a similar White Paper is soon to be published in Scotland. We are reserving comments on the subject until this White Paper is available for scrutiny.

9.5. Care in Editing

This is bad. The average time taken to properly edit a case sheet, in a random sample of 12 newly returned to file from the Unit, was 3 minutes.

10. TIME TAKEN TO COMPLETE INVESTIGATIONS

Undue delays often occur in the reporting of E.C.Gs., and there is a delay of from 6 to 8 weeks in obtaining barium meals, I.V.Ps. and cholecystograms for out-patients.

11. DISCHARGE LETTERS

From the same sample of 50 case sheets, we measured the length of the discharge letter, and the time interval between the patient's discharge from the ward and the date on the letter heading. These were as follows:-

DOCTOR	NO. OF LETTERS	AV. NO. OF LINES IN EACH	EXTREMES IN LINES	AV. TIME INTERVAL PER LETTER (DAYS)	EXTREMES IN DAYS
CD	11	14.9	33 to 5	6.0	15 to 2
SMITH	9	22.0	28 to 12	8.1	16 to 4
CJ ¹	2	24.0	38 to 10	4.5	5 to 4
HARDEN	1	54.0	-	8.0	-
CH	7	19.5	41 to 8	12.0	16 to 7
CB	4	6.7	12 to 3	8.7	17 to 1
CE	4	49.5	62 to 41	4.5	11 to -1*
CI	1	37.0	-	11.0	-
CF	9	25.8	51 to 10	4.6	11 to 1
CK ²	2	27.0	35 to 19	8.5	9 to 8
TOTAL	50	23.0	62 to 3	7.1	17 to -1*

1. Formerly Registrar in the Haematology Team

2. Formerly Registrar in the Calcium Team

* Such a letter was sent 1 day before the patient was discharged.

12. OUT-PATIENTS12.1. Yearly Throughput (for the whole Unit)

	to 4/66	to 4/65	to 4/64	to 4/63
TOTAL OUT-PATIENTS PER YEAR	13364	13113	12276	12962
NEW OUT-PATIENTS	1502	1371	1447	1321
RETURN OUT-PATIENTS	11862	11742	10829	11641

12.2. Waiting Lists

12.2.1. The waiting list for new appointments for the General Medical Clinics is 2 to 3 weeks.

12.2.2. As far as admission to the wards is concerned priorities are established purely on clinical grounds. An admission to the Gardiner Institute for investigatory procedures may take several months to effect.

13. THE UNIT SECRETARIES

13.1. Work Distribution

13.1.1. Wards D3 and 4

13.1.1.1. General Duties

These include:-

- a) Typing in- and out-patient letters except those relating to the Gardiner Institute. (See para. 4.3.4.)
- b) Completing diagnostic index cards.
- c) Filing laboratory, etc., reports.
- d) Answering telephone calls.
- e) Making stationery indents.
- f) Arranging appointments for out-patients, by liaison with the Records Department.
- g) Dealing with waiting list correspondence.
- h) Miscellaneous duties at certain Out-Patient Clinics.
- i) Collection, preparation and distribution of staff mail.

13.1.1.2. Individual Duties

- a) Mrs. Sutherland works especially for Dr. Goldberg's Team.
- b) Mrs. Lagerwaem works especially for Dr. Alexander's Team.
- c) Mrs. Gegg works especially for Dr. Cameron's Team (i.e. the Cardiac Department)

The first 2 named are housed in an office in the ward corridor, but Mrs. Gegg is housed in an office in the E.C.G. premises, and she has no personal telephone.

13.1.2. Gardiner Institute

13.1.2.1. The secretaries here are as follows:-

- a) Mrs. Marshall is personal secretary to Professor Wayne.
- b) Mrs. Faulds is librarian. She also types papers for publication and sends out reprints.
- c) Miss Stewart is personal secretary to Dr. Goldberg. She also types certain material for the research laboratories in the Institute.
- d) Miss Charteris is personal secretary to Dr. Alexander.
- e) Mrs. Henaghan is personal secretary to Dr. Smith, but is employed on a part-time basis. Her work includes typing lectures and compiling a diagnostic research index of patients for Dr. Smith.

13.1.2.2. These secretaries type most in- and out-patient letters relating to the Gardiner Institute (see para. 4.3.4.). At times, when the volume of work is too great, some letters are passed to the hospital typing pool. This consists of 2 full-time and 2 part-time secretaries, who deal with clinical typing for certain out-patient clinics which are not attached to medical or surgical in-patient Units in the hospital.

13.2. Employing Agent

The 3 secretaries for Wards D3 and 4 are N.H.S. staff employed by the Board of Management. Those of the Gardiner Institute are all employed by the University of Glasgow. They thereby qualify for longer holidays than the N.H.S. secretaries.

13.3 Work Load in Wards D3 and 4.

13.3.1. This load fluctuates to some extent from week to week. It is the usual practice at present to hold back out-patient notes until all the reports relating to a patient's consultation are available, and then to send 1 composite letter. We suspect that many more immediate letters would be dictated as interim reports were the secretaries not likely to be overwhelmed by the increased volume of such typing work.

13.3.2. Work load of typing was assessed by analysis of 1 sample week (before Ward D3 patients were transferred to Knightswood Hospital) as follows:-

DOCTOR	IN-PATIENTS			OUT-PATIENTS			OTHER		
	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER
ALEXANDER	-	-	-	17	3	5.7	-	-	-
CAMERON	-	-	-	70	2	35.0	49	5	9.8
GOLDBERG	-	-	-	93	6	15.5	-	-	-
CD	-	-	-	42	3	14.0	16	1	16.0
CG*	-	-	-	-	-	-	70	1	70.0
SMITH	78	3	26.0	312	11	28.4	8	2	4.0
HARDEN	72	3	24.0	92	6	15.6	9	1	9.0
CH	-	-	-	187	13	14.4	42	5	8.4
CB	-	-	-	246	15	16.4	-	-	-
CA	91	2	45.5	87	4	21.8	22	3	7.3
CE	11	1	11.0	54	4	13.5	25	2	12.5
CI	71	2	35.5	199	9	22.1	-	-	-
CF	18	1	18.0	19	2	9.5	-	-	-
CC	45	1	45.0	82	7	11.7	-	-	-
TOTAL	386	13	29.7	1500	85	17.6	241	20	12.1

Overall total = 2127 lines in 118 letters
 = 18.0 lines in each (average)

* Employed in Dr. C.D. Anderson's O.P. Clinic during period of sample.

13.4. Work Load in the Gardiner Institute

We have not attempted to assess this in detail for certain reasons, viz:-

- 13.4.1. There is a demarcation dispute in that the University authorities maintain that their employees should not type routine case sheet material for Western Infirmary patients. This is, of course, what is actually happening at present, although the Gardiner Institute maintains a fictional autonomy
- 13.4.2. The Board of Management, on the other hand, recognise this autonomy as a de facto as well as a de jure situation.
- 13.4.3. Hence such approaches as have been made by the Gardiner Institute medical staff to the Board of Management and to the University for extra secretarial staff to cope with the case sheet correspondence, particularly of out-patients, have met with denials of responsibility, for the reasons given above.
- 13.4.4. There seems to be a real danger that the University authorities may withdraw their secretaries from Gardiner Institute Clinics which are not shown to be wholly research ventures.
- 13.4.5. Secretarial and medical staff of the Gardiner Institute will be intermittently on holiday until the latter part of April, 1966, and the resulting contraction of the O.P. Clinic turnover prevents us from obtaining a representative sample of the normal work load.
- 13.4.6. Ward D3 is at present closed for several months for structural alterations and the patients have been transferred to Knightswood Hospital. However, the staff of the Unit are still attending these patients, and the case sheets are still being brought back to the Unit for the typing of letters. Batching of work is, therefore, inevitable for the work of Wards D3 and 4, and this will reflect, in turn, on the work of the Gardiner Institute, for which the same physicians are responsible.
- 13.4.7. There is at present an enormous backlog of correspondence relating to the Bone Clinic, and on 2 recent occasions we counted over 40 case sheets of out-patients awaiting letters being typed. On the first occasion the lack of a tape recorder was responsible, on the second, the letters were already on tape, but the secretary could not cope.

13.5. Recording Equipment

13.5.1. Wards D3 and 4

1 tape recorder for general dictation use plus 1 for Dr. Cameron's personal use; and 1 machine for transcription by each secretary.

13.5.2. Gardiner Institute

1 tape recorder for general dictation use and 2 for transcription by the secretaries.

13.6. Recommendations on the Secretarial Facilities in Wards D3 & 4

These have already mostly been mentioned in other parts of this report, but the following are stressed:-

Mrs. Gegg should be housed in the ward area. Each secretary should have a personal telephone. There should be more table, shelf and cupboard space. The number of tape recorders for dictation is quite inadequate: we suggest at least another 3 machines be provided.

13.7. Recommendations on the Secretarial Facilities in the Gardiner Institute

The present situation is chaotic and demands immediate attention.

13.7.1. The administrative stalemate as to who is responsible for providing secretaries for the Institute O.P. Clinics must be resolved before anything else can be decided.

13.7.2. The number of tape recorders is grossly inadequate. We understand that more are presently being purchased, and suggest a minimum number should be 1 per secretary for transcription, plus 4 for dictation.

13.7.3. More shelf, table and cupboard space should be provided in the secretaries' offices.

13.7.4./

- 13.7.4. Once all these matters have been attended to, a detailed work study over a period of several months is necessary to assess the need for augmenting the present secretarial staff.
- 13.7.5. It should be possible to rationalise the work of the Unit as a whole, and to eliminate, in many instances, the present artificial division between the 2 wards on the one hand and the Gardiner Institute on the other. We feel that the division is, on balance, more of a hindrance than an aid to the working efficiency of the Unit.
- 13.7.6. The present system of haphazardly off-loading out-patient typing on to the hospital typing pool is thoroughly unsatisfactory and should be completely discontinued.
- 13.8. Comments on Secretarial Duties in General
- 13.8.1. We feel that, before increasing the secretarial establishment, an attempt should be made to improve environmental factors such as those we have already mentioned, especially as regards working space, tape recorders, telephones, and messenger service.
- 13.8.2. We also strongly advocate the introduction of mechanical documentation, which must include a labelling service (e.g. "Addressograph".)
- 13.8.3. We believe that the resulting saving of the secretaries' time (and personal effort) and the increasingly rapid throughput of their work, will certainly greatly reduce the need to increase the secretarial establishment.
- 13.8.4. We are opposed, for various reasons, to the introduction of a central typing pool, however mechanised, to replace Unit secretaries in the Infirmary. We do not wish, at this stage, to pursue this topic further.

14. ACKNOWLEDGEMENTS

We thank all members of the Infirmary staff,
without whose coöperation this report could not have
been written.

15. APPENDIXTHE RADIO-ISOTOPES DEPARTMENT15.1. Location

The Radio-Isotopes Department is an integral part of the Western Infirmary, in charge of the Professor of Medicine, and is situated within the Gardiner Institute. In spite of this location, it is not administered by the University of Glasgow.

15.2. Staff15.2.1. Physicians

Dr. Alexander is Consultant-in-charge, and Dr. Harden Registrar.

15.2.2. Physicists

2 graduate physicists employed by the Regional Physics Department of the Western Regional Hospital Board.

15.2.3. Technicians

1 employed by the Regional Physics Department of the Western Regional Hospital Board and 2 by the Board of Management for Glasgow Western Hospitals.

15.2.4. Receptionists and Secretaries

Nil

15.3. Work Specification15.3.1.

A great deal of the Department's work consists of routine procedures. Research is continually in progress as well, however, and today's research may be tomorrow's routine, so that the dividing line between them is ill-defined and arbitrary. This is particularly so in the case of Tc-99 (see para. 15.3.4.)

15.3.2. Routine Work

- a) Radio-isotope procedures, involving mainly iodine, but also, to a much lesser extent, chromium, iron, calcium and strontium.
- b) Estimation of P.B.I. (protein-bound stable iodine), calculated from blood.
- c) Estimation of P.I.I. (plasma inorganic stable iodine), calculated from urine.
- d) T₃ resin uptake. T₃ is tri-iodo-thyronine. The test measures the degree of binding of thyroid hormones in plasma, and is calculated in conjunction with P.B.I. The latter may be high, not only in cases of thyrotoxicosis, where there is excess circulating thyroid hormone, but also in pregnancy; and it may be low after ingestion of certain drugs, such as aspirin. The T₃ resin uptake defines these false high and low values, where the patients are, in fact, euthyroid.

15.3.3. Research

This covers a wide field, but 1 development is worth noting in some detail. Experimental studies in radiation scanning are in progress in collaboration with the Radiotherapy Department of the Infirmary, and some of the techniques are now so fully developed that they might be better described as routine work. Particular success has been achieved with technetium-99m.

15.3.4. Technetium-99m

Technetium (Tc) is a totally artificial element, of atomic number 43, and is a transitional element in the Periodic System. There are a number of isotopes, all in the solid state, and all very unstable, except for 3, viz:- Tc-97, Tc-98 and Tc-99. The last-named also exists in unstable isomeric form, Tc-99m, which has a half-life of 6 hours, and which is manufactured by mutation from molybdenum-99. It is a pure gamma-ray emitter, and scanning techniques are being developed with it, particularly with regard to thyroid, stomach, liver and brain.

15.4. Routine Work Load15.4.1. Source of Referrals

Tests are done on patients who reside in the West of Scotland, but only if they are referred by the staff of the Western Infirmary or other hospitals. There are no "direct-access" facilities for general practitioners. Most patients personally visit the Department for the test procedures, but, in some involving I-131, the specimens of blood and urine are dealt with by post. This is a matter of convenience in these cases, but the information from the results is less comprehensive and satisfactory than it would have been had the patients attended the Department personally for thyroid gland monitoring (i.e. "neck counts") to be done also.

15.4.2. Throughput Figures

In April, 1966, the following numbers of patients attended the Department for tests. The figures do not include postal items.

TEST	NUMBER FOR APRIL 1966	RADIO-ISOTOPES LABORATORY
ROUTINE I-131 TESTS	98	
ROUTINE I-132 CLEARANCES	76	
INTRAVENOUS I-132 CLEARANCES	48	
CHROMIUM STUDIES	1	
IRON STUDIES	1	
STRONTIUM AND CALCIUM STUDIES	NONE STARTED *	

* But each test runs for 6 months

15.4.2. Throughput Figures (Contd.)

TEST	NUMBER FOR APRIL, 1966	CHEMICAL LABORATORY
P.B.I.	230	
P.I.I.	230	
T3 RESIN UPTAKES	132	

15.4.3. Routine I-131 Test Details

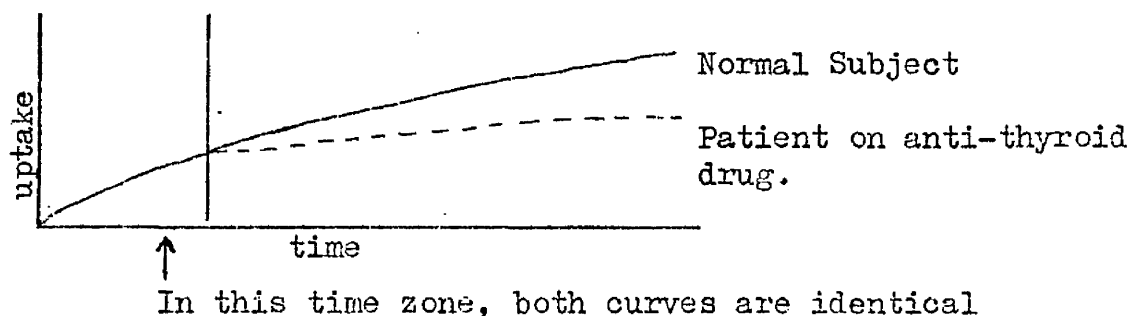
The dose of I-131 is given to the fasting patient orally at time zero. Thyroid gland uptake is measured (by "neck count") at 5 and 48 hours, and a venous blood specimen is taken at 48 hours. In suspected hypothyroidism all urine is collected from time zero to 48 hours.

15.4.4. Routine I-132 Clearance Details

The half-life of I-132 is 2.4 hours (as opposed to 8.04 days for I-131), hence this substance's increasing popularity for thyroid function tests. The dose is given to the fasting patient orally at time zero. Thyroid gland uptake is measured at 60 and 150 minutes, and venous blood taken at 105 minutes. The patient empties his bladder at time zero, and urine is taken at 150 minutes. During the whole time of the test the patient must not eat or drink.

15.4.5. Intravenous I-132 Clearance Details

This test is used to measure thyroid function in patients on anti-thyroid medication. With I-132, one can get very early thyroid uptake measurements, which are essential, because anti-thyroid drugs only affect the latter part of the uptake curve.



15.4.5. Intravenous I-132 Clearance Details (Contd.)

Intravenous administration of I-132 obviates interference with the test readings by absorption factors in the alimentary tract. At time zero the fasting patient is given the dose of I-132 intravenously by a physician. At 2 and 20 minutes, thyroid uptake is measured by "neck count", and venous blood is taken at 11 minutes. These times are critical in terms of seconds, for accuracy of results. (see para. 15.5.8.)

15.4.6. Comments on Work Load

It will be apparent from the foregoing remarks that these tests involve a very high degree of accuracy, especially as regards timing, on the part of the Departmental staff, and also considerable discomfort to the attending patient. It must be borne in mind that the latter, apart from being possibly hungry and thirsty, and being excited and nervous at the prospect of being tested with a radio-isotope, is frequently excited and nervous to a pathological degree because of thyrotoxicosis. It is exceedingly important, therefore, that the premises should be adequate, both for the exactitude of the tests and for the patient's comfort and peace of mind. The following paragraphs will indicate that such is by no means the case.

15.4.7. Second Tests

It cannot be over-emphasised that, if an error of timing is made in the I-131 routine test, the procedure cannot be soon repeated. This is because the first test dose of the isotope modifies the response to a subsequent dose.

15.5. Adequacy of Premises

15.5.1. The Department comprises several rooms on 3 floors of the Gardiner Institute, and the rooms themselves were not originally designed for laboratory purposes. Those on the ground floor, where the patients are tested, were adapted from an out-patient clinic, and, although one might have expected that this would be an advantage, in fact, it is not so.

15.5.2./

15.5. Adequacy of Premises (Contd.)

15.5.2. The waiting accommodation for patients is a short through corridor, which is small, draughty and cheerless, except for a miniature fish tank. It will be remembered that in a routine I-132 clearance the patient is in the Department for $2\frac{1}{2}$ hours (see para. 15.4.4.).

15.5.3. The patients' toilet is outside the entrance door of the building.

15.5.4. There are no facilities for examining a recumbent patient, nor is there any routine clinical diagnostic equipment.

15.5.5. There are no sources of food or drink for patients nearer than the public cafeteria in the main out-patient department of the Infirmary. Patients, therefore, leave, as well as arrive, in the fasting state.

15.5.6. As there are no nurses in the Department, nor full-time receptionists, reception and chaperoning of patients must be undertaken by the technicians, who are, fortunately, female. This, apart from anything else, seriously interferes with the laboratory routine.

15.5.7. Transport of specimens between the 3 floors of the Department means much running up and down stairs by the technicians.

15.5.8. There is an almost total lack of mechanical alarm-timers. This seriously endangers the timing and, therefore, the accuracy of test procedures (see para. 15.4.5.).

15.5.9. Telephone facilities in the Department are relatively good.

15.6. Laboratory Reports

There being no secretary, all the reports issued by the Department must be hand-written. Much of this writing is done by the physicians themselves and this, apart from being a waste of professional time, causes delay in the issuing of reports.

15.7. Summary of Recommendations

15.7.1. The premises are inadequate and should be upgraded, especially as regards patients' waiting and toilet facilities.

15.7.2. Reception of patients should be undertaken by special staff.

15.7.3. There should be facilities and equipment for full clinical examination of all patients.

15.7.4. At least 1 full-time secretary should be employed in the Department.

15.7.5. There should be at least 2 tape recorders in the Department, 1 of them being for transcription.

15.7.6. There should be numerous mechanical alarm-timers, both wall and lapel.

15.8. Final Comment

Considering the inadequate facilities in the Department for dealing with patients, we are more than surprised that it functions so well. The fact that it does so is a tribute to the skill, ingenuity and patience of the personnel staffing it.

IV

SURVEY OF PROFESSOR KAY'S UNIT

WESTERN INFIRMARY, GLASGOW

JUNE TO JULY, 1966

M.R.R.G. REPORT NO. 14

First published: August, 1966.

Revised: October, 1967.

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1. UNIT CONCERNED

Professor A.W. Kay's Unit of General Surgery, comprising Wards D6 and 7 plus part of Ward A3, together with the Department of Surgery.

2. LOCATION

Wards D6 and 7 are on the second floor of the main Infirmary block at the western end of the through corridor. The Department of Surgery occupies several storeys in the same building as the Gardiner Institute of Medicine.

3. UNIT STAFF

3.1. Surgical

Status ¹	Number	Our designation hereafter
CONSULTANT	4	DRS. ² DA, DB, DC, DD ³
SENIOR REGISTRAR	2	DRS. DE, DF ⁴
REGISTRAR	3	DRS. DG, DH, DI
SENIOR HOUSE OFFICER	1	DR. DJ
HOUSE SURGEON ⁵	2	DRS. DK, DL

1. For simplicity, we have not distinguished between N.H.S. and University Staff. All Consultants, except Dr. DD, are whole-time in the Unit.
2. For simplicity, we have designated all surgeons, as well as physicians "Dr."
3. Visiting Plastic Surgeon, with major commitments in other hospitals.
4. Research physician (attached).
5. See paragraph 4.8.

3.1.1. In addition, there are usually several "intensive-term" medical students attached to the Unit for each University 10-week term, throughout the year, who do routine clinical clerking.

3.1.2. There are also several medical graduates, engaged mainly on research work, who have not been listed, because they have no major commitments in the routine clinical work of the Unit. They include, however, all the staff of the Oxygen Pressure Unit.

3.2. Nursing and Domestic

The following staff are usually present, but the situation is always fluid.

3.2.1. Day Staffs in Wards D6 & 7.

Each comprise:-

- 1 Sister
- 2 Staff Nurses
- 1 State Enrolled Nurse (part-time)
- 2 Student Nurses
(usually 1 Senior and 1 Junior)
- 1 Nursing Auxiliary
- 1 Orderly
- 1 Maid

3.2.2. Night Staffs in Wards D6 & 7.

Each comprise 1 Staff Nurse and 1 Student Nurse. In addition, there is 1 Nursing Auxiliary seconded to the Unit on Receiving Nights.

3.2.3. Day Staff in the Recovery Room.

1 Sister and 1 Staff Nurse.

They are relieved from the wards, and they themselves work in the wards if they have no other commitments.

3.2.4. Day Staff in Theatre

- 2 Sisters
- 1 Staff Nurse
- 1 Senior Student Nurse (sometimes)
- 1 Male Orderly.

3.2.5. Night Staff in Theatre

Only the Theatre of the Receiving Unit is staffed at night, as follows:-

- 1 Sister or Staff Nurse
- 1 Student Nurse
- 1 Orderly

3.2.6. Hours of Work

Day staff work between 8.00 a.m. and 8.30 p.m. (or, in fact, 8.45 p.m., to allow for an overlap with oncoming night staff).

3.3. Secretarial

3.3.1. Wards D6 and 7

1 part-time and 2 full-time Unit secretaries, employed by the N.H.S. They deal with most clinical record work.

3.3.2. Department of Surgery

4 full-time secretaries, employed by the University; one of them being personal secretary to the Professor. They deal mainly with research and teaching work, but also with a few clinical records. There are, in addition, 2 punch-tape operators, engaged on computerising research data.

4. WORK SPECIFICATION

4.1. Bed Complement

The "official complement" is 56 beds. The actual total is 64, made up as follows:-

- (a) Ward D6 (Male) : 26 in main ward plus 1
2-bedded side room. = 28
- (b) Ward D7 (Female) : 24 in main ward plus 1
2-bedded side room. = 26
- (c) One 4-bedded side room off D6, which
accommodates (all) male or female
patients as circumstances demand.
- (d) 6 beds in Ward A3 (male).

4.1.1. Of these 64 beds, Dr. DD uses about 2 male and 2 female at any one time for his plastic surgery patients.

4.1.2. At the time of this Survey, work on ward decoration was in progress. Ward D7 was closed, except for 2 beds in the side room. 2 additional female beds were in use (on loan) in Ward C3. The total bed state, therefore, was 4 female, 34 male, and 4 optional = 42.

4.2. Out-Patient Clinics

CLINIC	DAY & TIME	LOCATIONS	SURGEONS	APPROX.NO. OF PATIENTS EACH DAY
GENERAL SURGICAL	MONDAY A.M.	O.P.DEPT.	DRS. DA, DB, DC.	30 new + 50 return
GENERAL WARD RETURN	FRIDAY A.M.	O.P.DEPT.	DR. DB.	50
PEPTIC ULCER	FRIDAY A.M.	O.P.DEPT.	DRS. DC, DE.	10 new + 25 return
PLASTIC SURGERY	WEDNESDAY A.M.	O.P.DEPT.	DR. DD.	20
FIBEROSCOPY	MONDAY A.M. & FRIDAY A.M.	WARDS D6 & 7	DR. DC.	4
SIGMOIDOSCOPY	THURSDAY P.M.	WARDS D6 & 7	DR. DB.	9

At these clinics, assistance is provided by various members of the junior surgical staff.

- 4.2.1. In addition, Drs. DB & DC alternate in giving the surgical advice in the Vascular Clinics -(see "Survey of Dr. Richards' Unit" : M.R.R.G. Report No.2, paragraph 4.2.1.) held on Thursday afternoons.

4.3. Routine Theatre Sessions

1. Monday morning : DRS. DE (or DI) and DJ.
2. Monday afternoon:

In theatre in O.P. Department: minor procedures, under local anaesthesia, by a Registrar or S.H.O.

3. Tuesday morning : DRS. DB and DH.
4. Wednesday morning : DR. DA. and an assistant
5. Thursday morning : DRS. DC and DI.
6. Friday morning (Plastic Surgery) : DRS. DD. and DJ.

4.4. Routine Ward Rounds

A full ward round is conducted daily by a Consultant, including Sundays. Because of other commitments, the ward round is usually held in the early afternoon on Mondays and Fridays. Dr. DD, however, looks after his own patients in the wards, and visits them at other times.

4.5. Routine Admissions

These are arranged irrespective of Receiving Days, and are planned in relation to investigations and/or operations which may be required. Dr. DI keeps the waiting list. Because one particular surgeon has placed a patient on the waiting list does not necessarily result in his personally operating on that patient. (See paragraph 5.1.)

4.6. Receiving Day

Every fifth day, running through weekends. The name is misleading in that on this particular day the Unit receives emergency patients. The 24 hours run from 8.00 a.m. to 8.00 a.m., and there is always a Consultant on call (excluding Drs. DA and DD). There is also always someone of Registrar or Senior Registrar status present in the Infirmary as senior-on-call; in addition, an S.H.O. is present. It follows, therefore, that the House Surgeons are rarely required to assist in Theatre on these days. During the whole night either a Registrar or S.H.O. stays in the Infirmary.

4.7. Teaching Commitments

Undergraduate and postgraduate.

4.8. Extra Commitments

Each House Surgeon is seconded for 6 weeks of his 6 month term to staff the Casualty Department of the Infirmary. During this time 2 such House Surgeons (from the Infirmary rota) work alternate 24-hour shifts. On his alternate days away from the Casualty Department, the House Surgeon has no commitments at all in his parent Unit, so that, in effect, for some 3 months of each 6 the Unit has only 1 House Surgeon. In Professor Kay's Unit an intensive-year medical student is always employed as locum House Surgeon during these 3 months.

4.9. Research

The following projects are presently being pursued in connection with the Department of Surgery:-

4.9.1. Peptic Ulcer Investigation

With computer facilities, the following aspects are being collated:-

- (a) Clinical features.
- (b) Gastric acid secretion in relation to:-
 - (i) The augmented histamine test.
 - (ii) Insulin stimulation.
 - (iii) Medical vagotomy.
 - (iv) Gastrin.
- (c) Psychosomatic features.

4.9.2. Investigation of Enzymes of the Small Intestine

Particularly in relation to patients with ileostomies.

4.9.3. Hyperbaric Oxygen Therapy

Professor Kay is in charge of a special Oxygen Pressure Unit in the Infirmary.

4.9.4. Animal Research in Gastroenterology

In the Wellcome Laboratories at Garscube.

5. STAFF MORALE

- 5.1. It is apparent that the staff of the Unit work closely as one team, with collective responsibility for the patients.
- 5.2. It also appears, perhaps as a consequence of this, that the junior members have more spare time than they would have in other Units, and this is, of course, a thoroughly desirable state of affairs.

6. ADEQUACY OF PREMISES

6.1. Telephone System

- 6.1.1. The telephones in the ward areas are as follows:-
- D.7 corridor - one external and one internal 'phone.
D.6. (Sister's room) - one external 'phone.
Residents' room - one external 'phone.
Secretaries' office - one external 'phone.
Theatre - one external 'phone in the
anteroom with an extension
to the Surgeons' room.
Recovery room - one external 'phone (this room
also has an emergency bell).
- 6.1.2. There are various telephones in the Department of Surgery
which we need not consider further, as no patients are accommodated
there.

6.2. Space

The Unit secretaries work in one room, with only one telephone. Table, shelf and cupboard space are not lavish. There is insufficient teaching space, and no patients' day room.

6.3. Lighting

This is insufficient throughout most of the Infirmary, and is a definite handicap during minor surgical procedures in the wards. All fittings should be of fluorescent strip type, and we note that a start to this conversion has already been made in various wards.

6.4. Ward Design

The beds in the two main wards are accommodated in bays.

6.5. Ward Wash-Hand Basins

For surgical staff there is at present one basin in each main ward, and one basin in the 4-bedded sideroom. These numbers are quite inadequate.

6.6. X-Ray Viewing Boxes

The case-sheet trolleys are equipped with these.

6.7. Patient Labelling

6.7.1. Bedside labelling of patients is restricted to labels of adhesive plaster affixed to the foot of the bed-frames. Patients in Theatre are labelled with plastic wrist straps; these straps are removed immediately after the operation.

6.7.2. The Medical Defence Union and similar bodies have repeatedly stressed the advisability of adequate patient-labelling in a surgical Unit. We feel that all hospital in-patients should wear personal identification wrist straps all the time.

7. IN-PATIENTS' STATISTICS

	to 4/66	to 4/65	to 4/64	to 4/63
BED ESTABLISHMENT *	56	56	56	56
ADMISSIONS	1,556	1,537	1,530	1,551
INTER-WARD TRANSFERS IN	128	166	131	114
DISCHARGES	1,552	1,539	1,533	1,521
INTER-WARD TRANSFERS OUT	63	85	74	72
DEATHS	69	69	69	68
AVERAGE LENGTH OF STAY (DAYS)	11.1	10.5	10.9	10.9

* These official figures ignore the fact that the true bed complement in the Unit is 64. (see paragraph 4.1.).

8. PREVIOUS RECORDS

8.1. In a sample of 50 case sheets, relating to patients sequentially discharged recently from this Unit, 18 had previous Western Infirmary in-patient notes, and, of these, 12 had notes relating to the same illness, and 6 to another illness. The maximum number of in-patient episodes for any one patient was 2. There were, in all, 13 previous in-patient episodes for the same illness, and 22 for other illnesses.

8.2. In the same sample of 50 case sheets, the diagnostic breakdown (based on the present illness) was as follows:-

ALL MALIGNANT NEOPLASMS *	8
PEPTIC ULCER	8
GALL-BLADDER DISEASE	2
APPENDICITIS	4
HERNIAS	2
(intestinal and incisional, but not hiatus)	
INTESTINAL OBSTRUCTIONS	1
(except from hernias)	
ANO-RECTAL DISEASE	4
NON-SPECIFIC ABDOMINAL UPSET	2
HEAD INJURY	5
RENAL DISEASE	2
EXTERNAL GENITAL DISEASE	2
VARICOSE VEINS	2
BENIGN DISEASE OF BREAST	2
CARDIOVASCULAR DISEASE	3
MISCELLANEOUS	5
	<hr/>
	52
	<hr/>

7 of these 50 patients died.

* All the following figures are exclusive of malignant neoplasms.

8.3. In the same sample of 50 case sheets, the operation breakdown was as follows:-

VARIOUS HERNIA REPAIRS (<u>not</u> hiatus hernia)	2
VARICOSE VEIN LIGATION/STRIPPING	2
APPENDICETOMY	4
CHOLECYSTECTOMY	2
VAGOTOMY AND PYLOROPLASTY	2
VAGOTOMY AND GASTRO-JEJUNOSTOMY	2
GASTRECTOMY	NIL
SIMPLE REPAIR OF PERFORATED PEPTIC ULCER	2
HAEMORRHOIDECTOMY	2
OTHER INTESTINAL SURGERY	1
MASTECTOMY	1
LOCALISED EXCISION OF BREAST TISSUE	2
SUPERFICIAL LESIONS *	6
MISCELLANEOUS Ø	7
	<hr/> 35 <hr/>

* Wound suture, tissue biopsy, tissue excision, incision for phimosis.

Ø Including laparotomies.

9. PRESENT CASE SHEET9.1. Volume of Notes

A breakdown of the same samples of 50 case sheets, in terms of lines/pages showed:-

ADMISSION NOTES		PROGRESS NOTES		NURSES' NOTES	
AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES	AV. PER CASE SHEET	EXTREMES
26	61-6	5	31-0	29	127-0
1	3-1	1	2-0	2 *	6-0

* "Kardex" size (10" x 8")

9.2. Quality of Notes

These notes seemed to be of good quality. We note, once again, that surgical notes are more succinct than medical ones.

9.3. Volume of Insertions

In the same sample of 50 case sheets, the following insertions were found to be present:-

Document	Average per Case Sheet	Extremes
B.P. CHARTS	1.00	7 to Nil
ANAESTHETIC RECORDS	0.56	1 to Nil
E.C.G. REPORTS	0.04	1 to Nil
X-RAY REPORTS	0.64	3 to Nil
PATHOLOGY REPORTS	0.28	2 to Nil
BACTERIOLOGY REPORTS	0.52	3 to Nil
BIOCHEMISTRY REPORTS	0.70	5 to Nil
HAEMATOLOGY REPORTS *	1.14	4 to Nil
FLUID BALANCE CHARTS	1.00	7 to Nil
T.P.R. CHARTS	1.08	3 to Nil

Average length of stay 11.0 days (extremes of 41 and 1).
(see paragraph 7)

* It should be noted that E.S.Rs. are estimated in the wards.

10. TIME TAKEN TO COMPLETE INVESTIGATIONS

The delays in reporting E.C.Gs. and tissue biopsies; and in obtaining barium meals, I.V.Ps. and cholecystograms, have been mentioned elsewhere.

11. OPERATION NOTES

11.1. Surgeons' notes of operation procedures in this Unit are dictated and typed very soon after the operation itself, and a copy of the typed notes is sent to the general practitioner forthwith.

11.2. In the same sample of 50 case sheets, 29 had operation notes as follows:-

DOCTOR	NUMBER OF OPERATION NOTES	AVERAGE NO. OF LINES IN EACH	EXTREMES IN LINES
DR. DB.	3	9.0	12 to 7
DR. DC.	5	17.6	31 to 8
DR. DE.	4	17.2.	29 to 7
DR. DM *	2	10.5	14 to 7
DR. DH.	3	6.3	12 to 3
DR. DI.	5	9.6	25 to 5
DR. DN ø	1	4.0	-
DR. DJ.	6	11.2	22 to 7
TOTAL	29	11.8	31 to 3

* Formerly Senior Registrar.

ø Formerly Registrar.

12. DISCHARGE LETTERS

From the same sample of 50 case sheets, we measured the length of the discharge letter and the time interval between the patient's discharge from the ward and the date on the letter heading. These were as follows:-

DOCTOR	NO. OF LETTERS	AV. NO. OF LINES IN EACH	EXTREMES IN LINES	AVERAGE TIME INTERVAL PER LETTER(DAYS)	EXTREMES IN DAYS
DR. DB.	4	9.5	16 to 5	6.5	9 to 5
DR. DC.	8	11.3	26 to 6	6.9	13 to 3
DR. DE.	5	5.0	9 to 3	10.4	17 to 7
DR. DM. *	3	10.0	11 to 9	6.3	10 to 3
DR. DH.	10	8.1	14 to 5	7.4	13 to 2
DR. DI.	10	5.7	10 to 3	11.4	17 to 6
DR. DN. ø	1	3.0	-	6.0	-
DR. DJ.	9	6.1	15 to 3	6.9	14 to 1
TOTAL	50	7.6	26 to 3	6.2	17 to 1

* Formerly Senior Registrar.

ø Formerly Registrar.

13. OUT-PATIENTS

13.1. Yearly Throughput

	to 4/66	to 4/65	to 4/64	to 4/63
TOTAL OUT-PATIENTS PER YEAR	7,398	7,108	8,101	10,024
NEW OUT-PATIENTS	1,353	1,399	1,349	1,162
RETURN OUT-PATIENTS	6,045	5,709	6,752	8,862

13.2. Waiting Lists

13.2.1. The waiting list for new out-patient appointments is virtually nil.

13.2.2. As far as admission to the wards is concerned, a patient suspected of having a carcinoma is admitted without delay; one for routine surgery is admitted after an interval of less than 4 weeks (male or female). In the latter case, the admission is planned in conjunction with the composition of Theatre lists and is the responsibility of Dr. DI. (see paragraph 4.5.).

13.3. Out-Patient Clinic Facilities

We have already commented on these at length in our report concerning Dr. Richards' Unit. Now, however, our attention has again been drawn to the lack of privacy as regards sound, and the lack of nurses to act as chaperones.

14. THE UNIT SECRETARIES

14.1. Duties in Wards D.6 and 7:-

These include:-

1. Typing in- and out-patient letters.
2. Completing diagnostic index cards.
3. Filing laboratory, etc., reports.
4. Answering telephone calls.
5. Making stationery indents.
6. Arranging appointments for out-patients, by liaison with the Records Department.
7. Dealing with waiting list correspondence.
8. Miscellaneous duties at Out-Patient Clinics.
9. Collection, preparation and distribution of staff mail.

14.1.1. It should be noted that all correspondence to do with teaching and research is done by the secretaries in the Department of Surgery (see paragraph 3.3.2.). We do not propose to consider these tasks further.

14.2. Work Load

14.2.1. The majority of the work relates to out-patient correspondence, and this varies from week to week. It is present practice to send a letter to the general practitioner immediately after a patient's consultation at the clinic, and to send a follow-up letter when any reports pertaining to investigations made at this consultation come to hand. This obviously keeps the general practitioner fully up-to-date with his patient's progress, and is, we feel, to be thoroughly recommended.

14.2.2. Work load of typing was assessed by two sample week analyses, as follows:-

1ST WEEK

DOCTOR	IN-PATIENT LETTERS			OUT-PATIENT LETTERS			OPERATION NOTES		
	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER
DR. DA.	27	3	9.0	85	6	14.2	113	5	22.6
DR. DB.	31	3	10.3	102	18	5.7	-	-	-
DR. DC.	50	4	12.5	16	3	5.3	68	3	22.7
DR. DE.	50	6	8.3	56	16	3.5	33	2	16.5
DR. DF.	-	-	-	-	-	-	-	-	-
DR. DM. *	42	4	10.5	213	39	5.5	-	-	-
DR. DH.	48	6	8.0	199	19	10.5	26	3	8.7
DR. DI.	-	-	-	-	-	-	-	-	-
DR. DO. ϕ	-	-	-	-	-	-	-	-	-
DR. DJ.	-	-	-	41	8	5.1	-	-	-
TOTAL	248	26	9.5	712	109	6.5	240	13	18.5

OVERALL TOTAL = 1,200 lines in 148 letters
 = 8.1 lines in each (average).

* Formerly Senior Registrar

ϕ Research Associate, Dept. of Surgery.

2ND WEEK

DOCTOR	IN-PATIENT LETTERS			OUT-PATIENT LETTERS			OPERATION NOTES		
	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER	LINES	LET-TERS	AV. LINES PER LETTER
DR. DA.	-	-	-	19	2	19.5	44	2	22.0
DR. DB.	-	-	-	39	6	6.5	18	2	9.0
DR. DC.	-	-	-	75	14	5.4	43	3	14.3
DR. DE.	-	-	-	83	18	4.6	-	-	-
DR. DF.	-	-	-	75	7	10.7	-	-	-
DR. DM. *	-	-	-	202	22	9.2	55	6	9.2
DR. DH.	15	2	7.5	31	4	7.8	12	2	6.0
DR. DI.	-	-	-	16	3	5.3	-	-	-
DR. DO. ∅	-	-	-	13	1	13.0	-	-	-
DR. DJ.	-	-	-	-	-	-	43	3	14.3
TOTAL	15	2	7.5	553	77	7.2	215	18	11.9

OVERALL TOTAL = 783 lines in 97 letters

= 8.1 lines in each (average)

* Formerly Senior Registrar.

∅ Research Associate, Dept. of Surgery.

14.3 Recording Equipment

There are 5 tape recorders in the Unit, as follows:-

One in the ward area and one in Theatre for dictation, and three for transcription by the secretaries. These are said to be sufficient.

15. ACKNOWLEDGEMENTS

We wish to thank all members of the Infirmary staff, without whose co-operation this report could not have been written.

CHAPTER FOUR

P A T T E R N S E M E R G I N G

"The virtue of 'making-do' is entrenched in British hospitaldom: it sanctifies the sticking plaster patching a broken autoclave drum, and the exorbitant up-grading of wards due for demolition".

(Cohen, 1964)

The adverse features described in the foregoing reports are quite typical of most British hospitals, but the significance of some of my findings may not be immediately clear to the reader, and some of my comments require elaboration.

Premises

There is a growing tendency to keep crowding more and more facilities into a constant volume of space, which results in noisy, cramped conditions and less and less privacy. A situation is utterly deplorable in which a doctor is obliged to inform the relatives of a patient's death by interviewing them in an open corridor; such news is serious enough in its possible consequences (Hospital Medicine, 1967) without its being aggravated by the immediate environment.

Nor can a busy doctor, nurse or secretary afford to wait for two or three minutes for a telephone operator to acknowledge a request for an outgoing call. A PABX 3 system is the minimum requirement for all but the smallest hospital. It will eliminate the need for any internal or outgoing call to be routed through an operator; yet still we have the expensive situation where extra operators are employed, even at such a switchboard, to handle all outgoing calls in case members of the staff try to make personal calls free. A PABX (Private Automatic Branch Exchange) 3 must be bought, as opposed to a PABX 1 or 2 which is rented; it is suitable for all situations requiring over 49 automatic extensions, and can be expanded to accommodate hundreds of outside lines and thousands of extensions (G.P.O., 1965).

The Working Week.

Patients become ill and require urgent admission to hospital at any hour of the day or night. In the wards, therefore, staffing must be planned on the basis of a 168-hour week, although, as I have shown, the nursing staff on duty in wards at night is reduced to a minimum. In many hospitals, ancillary departments, ranging from laboratories and pharmacy to general stores and administration, now work a 40-hour 5-day week, and sometimes close for at least an hour at lunch time. We have a situation of ancillary services supporting wards on a 40/168 full-time basis, so that it is little wonder that delays occur and tempers are frayed.

Patient Identification

The necessity for labelling of all hospital in-patients cannot be over-emphasised. The cost of plastic wrist straps is low when weighed against the tragedy of irrevocable therapy to the wrong patient, and the resulting heavy legal damages probably sought against medical staff and hospital authorities, all because of inaccurate personal identification in the first place (Medical Defence Union et al, 1966).

Ward Equipment

Wash-hand basins are seldom numerous in wards except those dealing with infectious diseases. Cross infection, however, is a potential danger in any hospital situation, and its transmission can be via case records as well as other routes.

X-Ray films cannot properly be examined except by using a viewing box, preferably one with a variable brilliance control, nor can two films be adequately compared except by means of two such boxes side-by-side.

Further Enquiries.

The foregoing reports indicated serious delays in the X-Ray and E.C.G. services in the Western Infirmary. The reasons for these are apparent on reading the following two reports.

I

ORGANISATION OF THE E.C.G. SERVICES
OF THE WESTERN INFIRMARY, GLASGOW.

JANUARY, 1966

M.R.R.G. REPORT NO. 1

First published: March, 1966.

Revised: November, 1967.

FOREWORD

This survey was carried out at the request of Dr. A.J.V. Cameron, Consultant Physician in charge of the Cardiac Department of the Western Infirmary, in anticipation of certain alterations in premises, equipment and departmental services being made in the near future by the Board of Management for Glasgow Western Hospitals. He asked that specific aspects of the E.C.G. services be considered by us, viz:-

- (a) Accommodation
- (b) Staffing and equipment
- (c) The possibility of typing E.C.G. reports
- (d) The possibility of using copying machines
- (e) The filing system

Neither the document format nor the work routine we have recommended impress us as being anything like ideal, but the survey was limited by terms of reference governed by the firm wishes of the Consultant in charge - which is as it should be.

The survey does illustrate, however, how a methodical approach can clarify and improve a complex situation.

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OPERATING A COPYING SERVICE

1. WORK LOAD

1.1. At present

The Cardiac Department of the Western Infirmary provides E.C.G. services for the following hospitals:-

- 1.1.1. Western Infirmary: E.C.G.'s are recorded and mounted for in-and out-patients. Some are reported centrally in the Cardiac Department. Details of the work procedure are described later (paragraph 4).
- 1.1.2. Bath Street Clinic: Patients for E.C.G.'s are referred to the Cardiac Department at the Western Infirmary.
- 1.1.3. Royal Beatson Memorial Hospital; Ear, Nose and Throat Hospital; Gartnavel Hospital: Requests for E.C.G.'s are made to the Western Infirmary, and a technician goes out from the Infirmary by public transport with a portable machine. If the request is described as urgent the E.C.G. is usually recorded on the same day. In non-urgent cases there may be a delay of 1 or 2 days.

The tracing is mounted in the Western Infirmary; a copy is kept in the Cardiac Department files, having been prepared exactly as for a Western Infirmary patient. The master is returned to the hospital concerned.

- 1.1.4. Queen Mother's Maternity Hospital: This hospital has its own E.C.G. machine which is normally operated by its own medical staff. However, in addition, a technician from the Western Infirmary visits and records E.C.G.'s every Friday afternoon. Each tracing, irrespective of who recorded it, is mounted in the Western Infirmary and reported there. One copy is made by the electrostatic machine in the Records Department and kept in the Cardiac Department files. The master is then returned to the Queen Mother's Hospital.
- 1.1.5. Knightswood Hospital: A technician and E.C.G. machine are permanently seconded here from the Western Infirmary. Mounting and reporting of tracings (single copies) are done in Knightswood Hospital, and they are then sent to the Western Infirmary, where the Records Department make 2 electrostatic copies for each master. Each master plus one copy is sent back to Knightswood Hospital; the other copy is filed in the Western Infirmary.

1.1.6. Killearn Hospital: The Western Infirmary provides no E.C.G. technicians or machines for this hospital. However, tracings sent from Killearn to the Western Infirmary are mounted, but not reported. No copies are made and each master is returned to Killearn.

1.1.7. The above-mentioned services are all only available during the normal working hours of the Western Infirmary E.C.G. staff which are from 8.30 a.m. till 5 p.m. on weekdays, and from 8.30 a.m. till 12 noon on Saturdays. No emergency service is provided outwith these hours, although, in the Western Infirmary, at least, an E.C.G. machine is left outwith office hours for the personal use of the hospital medical staff.

1.1.8/

1.1.8. The position may therefore be summarised as follows:-

E.C.G. SERVICES PROVIDED BY THE CARDIAC
DEPARTMENT OF THE WESTERN INFIRMARY FOR
OTHER HOSPITALS

KILLEARN HOSPITAL
(own machine)

KNIGHTSWOOD HOSPITAL
(own machine and
technician)

BATH STREET
CLINIC

WESTERN
INFIRMARY

NO SERVICES PROVIDED
OUTWITH NORMAL OFFICE
HOURS

QUEEN MOTHER'S HOSPITAL
(own machine)

GARTNAVEL HOSPITAL
EAR, NOSE AND THROAT
HOSPITAL
ROYAL BEATSON MEMORIAL
HOSPITAL

(no machines)

TRACINGS FOR
MOUNTING ONLY

TRACINGS FOR
COPYING ONLY

ALL TRACINGS FOR MOUNTING
AND REPORTING
TECHNICIAN ON FRIDAY
AFTERNOONS

TECHNICIAN AND MACHINE
TRACINGS FOR
MOUNTING AND
REPORTING

- 1.1.9. Including all these services the Cardiac Department of the Western Infirmary processes some 15,000 tracings per year.
 - 1.1.10. The Board of Management plan soon to provide an "open door" E.C.G. service for general practitioners.
 - 1.1.11. Additional medical beds are shortly to be opened in Knightswood Hospital which will increase the E.C.G. load there.
-
- 1.2. Recommendations
 - 1.2.1. An attempt should be made to provide a more rational and uniform service to the other hospitals.
 - 1.2.2. As no service is at present provided outwith normal office hours we recommend that each hospital have its own E.C.G. machine(s).
 - 1.2.3. The Western Infirmary could then, if requested, provide a mounting and/or reporting service. Copying should be reduced to a minimum linked entirely to the needs of a reporting service.
 - 1.2.4. Should a technician from the Infirmary nevertheless occasionally have to visit another hospital, she should be provided with special transport, both to save time and to enable her to take an E.C.G. machine of adequate size.
 - 1.2.5. E.C.G.'s accepted by the Western Infirmary from other hospitals for mounting and/or reporting should enter the same work flow route as tracings recorded in Western Infirmary. (see paragraph 4.2.)

2. PREMISES

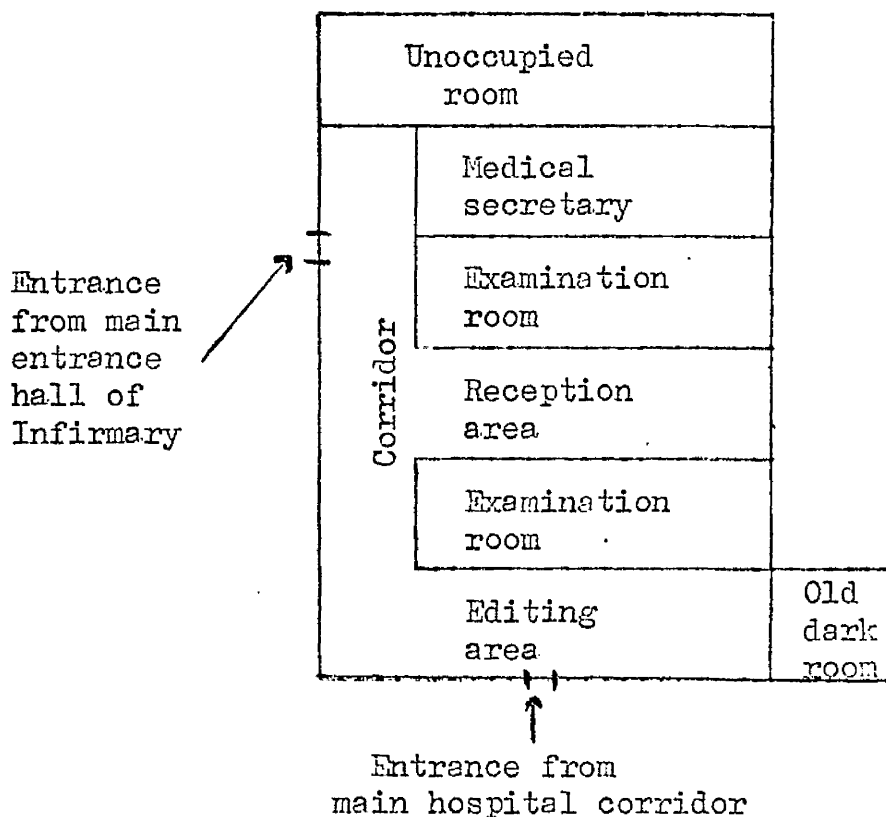
2.1. At present

2.1.1. The E.C.G. premises in the Western Infirmary comprise the ground floor of a 2-storey block beside the main entrance hall. The upper floor is occupied by the Medical Social Workers' (Almoners') Department. A scale drawing of the premises is in Dr. Cameron's possession; for this report a rough sketch will suffice to show the internal layout.

2.1.2. The Board of Management plan soon to incorporate, within the bounds of the present E.C.G. premises:-

- (a) A laboratory with facilities for oximetry and gas analysis.
- (b) Provision for phono- and vector-cardiography and
- (c) Facilities for an "open-door" service for general practitioners.

2.1.3. Sketch plan of the present premises



2.1.4. The medical secretary occupying one room of the premises has no connection with the work there, but is so housed because no accommodation exists for her elsewhere. Her work is concerned with other aspects of the Cardiac Department e.g. out-patient clinics.

2.1.5. The editing area is part of the main through-corridor of the premises and there are 2 working surfaces: one a shelf-top over filing drawers which is unduly high for sitting at and which has no recess for one's knees; the other a shelf at a useful height, but over a hot-water radiator and therefore again uncomfortable for one's knees. The area being part of a corridor makes for draughts which tend to scatter the paper material being edited.

2.1.6. The old dark-room was used as such in the days of indirect-writing E.C.G. machines but is now used for storing surplus equipment.

2.1.7. The lighting throughout the premises is poor.

2.2. Recommendations

2.2.1. Satisfactory incorporation within the present premises of the desired extra facilities is quite impossible. We suggest that the premises be extended to include the floor above, where the laboratory should certainly be housed. The Medical Social Workers' Department should be moved elsewhere and the staircase to it included within the ground floor of the new E.C.G. premises by the extension of the latter into the main entrance hall.

2.2.2. The medical secretary at present accommodated in the E.C.G. premises should be housed elsewhere, in/near Professor Wayne's Wards.

2.2.3. The editing area should be in a draught-proof room, with good work surfaces and guillotine equipment.

2.2.4. Lighting should be by fluorescent tubes of adequate luminosity.

2.2.5./

- 2.2.5. A single large examination room should be adequate, comprising curtained compartments each with its own couch. The actual number of these compartments is dependent upon the work load, staff and available floor space. We suggest a minimum of 5. (see paragraph 4.2.5.)
- 2.2.6. A separate reporting room should be provided with recording equipment next another room housing a typist with typewriter and copying equipment.
- 2.2.7. To accommodate a service for general practitioners a large waiting area for patients may be necessary.

3 STAFFING AND RECORDING EQUIPMENT

3.1. At present

- 3.1.1. There are three technicians and a supervisor in the E.C.G. premises of the Western Infirmary. In addition, one technician is permanently located in Knightswood Hospital (see paragraph 1.1.5) and one is permanently employed in the Western Infirmary in laboratory procedures elsewhere in the Cardiac Department and takes no part in E.C.G. recording.
- 3.1.2. Technicians work a 76-hour fortnight.
- 3.1.3. We have been specifically asked to make provision for the supervisor to be freed from routine duties so that she may devote most of her time to supervision and training of her junior staff.
- 3.1.4. There are 3 portable direct-writing machines for day-to-day use by technicians in the Western Infirmary. In addition, there is one mechanically unreliable portable machine left available to the medical staff outside normal office hours; and there is one light-weight portable machine used by a technician visiting other hospitals. This latter machine ["Cardioview" (H.E.P.)] uses narrow recording paper and has to be set for a sub-standard deflection if the tracing wave amplitudes are high. Consequently the final tracing may be less than ideal.

3.2. Recommendations

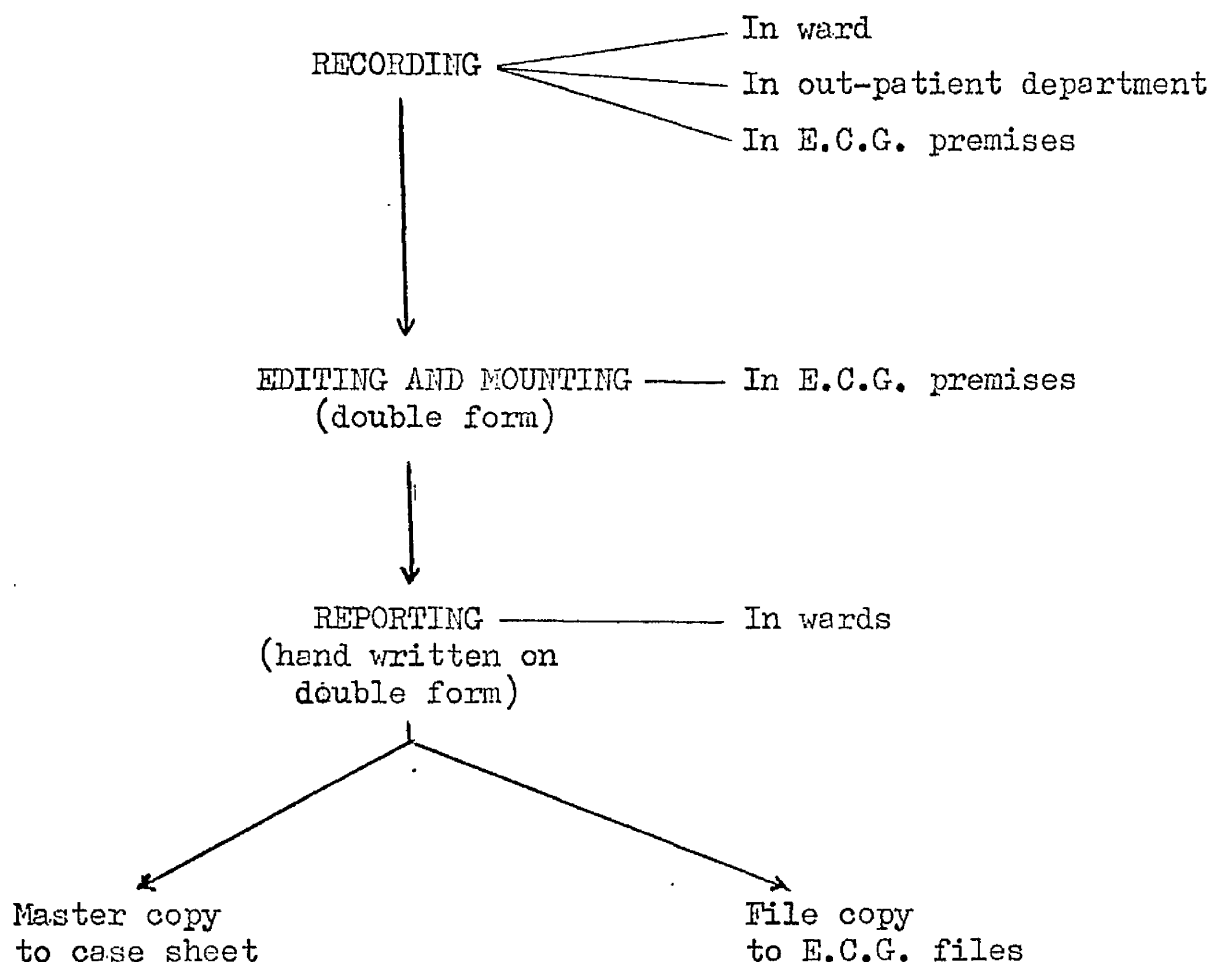
- 3.2.1. More technicians will be needed as the demands on the E.C.G. services grow with the provision of "open-door" facilities for general practitioners and the opening of new medical beds at Knightswood Hospital. The exact requirements are just now incalculable.
- 3.2.2. At present at least two extra technicians are required, if only to adequately cover periods of sickness and holidays, including such in Knightswood Hospital.
- 3.2.3./

- 3.2.3. At least one technician other than the supervisor, can then always be present in the E.C.G. premises in the Western Infirmary to answer the telephone, receive patients and deal with the many routine enquiries from other departments.
- 3.2.4. For a total staff of 6 in the E.C.G. premises, at least 6 non-miniature direct-writing E.C.G. machines should be provided, in good working order. This number should be sufficient to cope with emergency peak demand, and for routine repairs and maintenance. No additional machines should be necessary for visits to other hospitals or for use in the Western Infirmary outwith office hours.
- 3.2.5. A typist should be employed purely to type reports, copy documents and file documents. She should not normally be involved in patient reception.

4. WORK PROCEDURE IN THE WESTERN INFIRMARY

4.1. At present

4.1.1. Present work flow chart



4.1.2. All in-patient E.C.G.'s are recorded in the wards.

4.1.3. An E.C.G. technician attends certain clinics in the out-patient department and records E.C.G.'s there.

4.1.4. Other out-patients attend the E.C.G. premises in person.

4.1.5. In the absence of E.C.G. technicians medical staff have personal access to a machine. (see paragraph 3.1.4.)

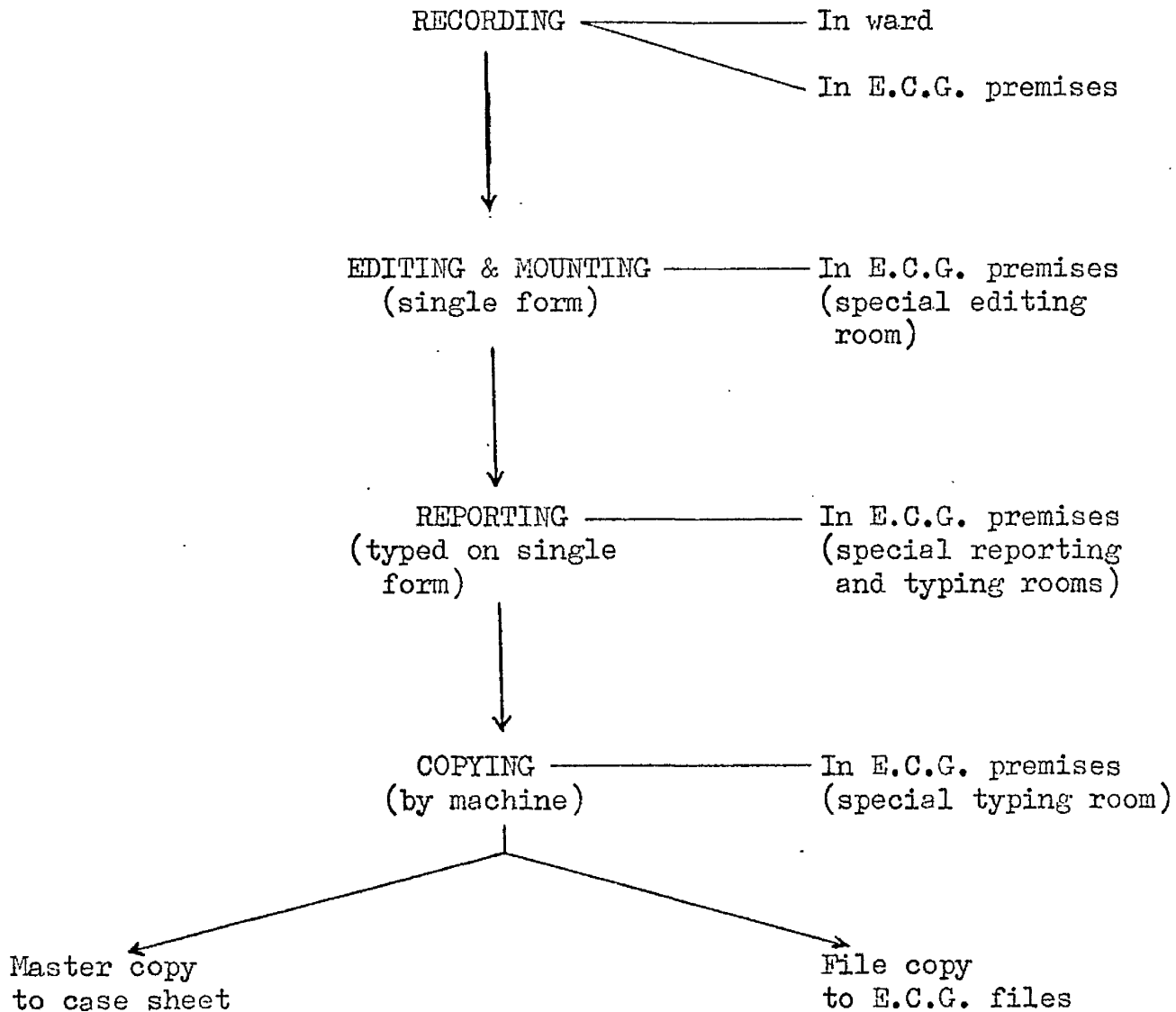
4.1.6./

- 4.1.6. E.C.G.'s are requested on a multiple form which consists of a master copy on a carbon strip on a file copy. (see paragraph 9.1.)
- 4.1.7. Normally 9 leads are recorded unless specifically otherwise requested, but in Professor Wayne's Unit 13 leads are routinely recorded.
- 4.1.8. In the E.C.G. premises 2 portions of each lead are cut from the original tracing. A series of 9 or 13 leads is then mounted on the master copy and a similar series on the file copy.
- 4.1.9. Each strip is cut along top and bottom edge as well as at each end. This is to enable the full series to be mounted on the form. Sometimes, if the wave amplitudes are very great, some of the strips must be mounted overleaf on the reverse face of the form.
- 4.1.10. The strips are mounted under "Laminated Sellotape" which had adhesive along only 2 edges. This is to minimise marking the heat-sensitive tracing paper with glue.
- 4.1.11. Mounting is a time-consuming process; further details are considered in the section on cost (paragraph 5).
- 4.1.12. The double form, still complete with carbon insert and with an E.C.G. series mounted on each of the 2 sheets, is then forwarded to the appropriate physician for reporting.
- 4.1.13. Reporting is done by the Registrars and Senior House Officers in various medical Units. Professor Wayne's and Dr. Kerr's staff report their own tracings. Dr. Fraser's and Dr. Richards' staff report their own tracings and those of all other Units in the hospital. No central reporting service is provided by the Cardiac Department.
- 4.1.14. Reports are handwritten by the physicians concerned. The space available on the form is small and the carbon copy in particular correspondingly unsatisfactory in legibility.
- 4.1.15. The file copy is returned to and stored in the E.C.G. premises. The master copy is inserted in the case sheet.

4.2. Recommendations/

4.2. Recommendations

4.2.1. New work flow chart



4.2.2. All in-patient E.C.G.'s should continue to be recorded in the wards.

4.2.3. E.C.G. technicians attending out-patient clinics are often considerably under-employed. We suggest that this practice be discontinued and that all out-patients visit the E.C.G. premises for their tracings to be recorded.

4.2.4./

- 4.2.4. E.C.G. tracings for these out-patients should be immediately mounted and returned to the clinic for inspection by the physician concerned.
- 4.2.5. The number of examination compartments in the E.C.G. premises would have to be 5 or 6 in view of the above remarks, to allow for a rapid patient throughput.
- 4.2.6. It is imperative that E.C.G. machines and adequate stocks of recording paper should continue to be available at immediate notice for personal use by the medical staff of all Units.
- 4.2.7. The E.C.G. request-and-mounting form should consist of a single sheet only. The format of the document is limited by the overall page size and the space needed for mounting the E.C.G. strips. However, it would be more satisfactory if the report area were left entirely blank of printing and the salient features in each report could then be selected and arranged at the reporter's discretion. Any additional comment for which there is insufficient room in the report area should be detailed overleaf, with a comment such as "P.T.O." to specify this.
- 4.2.8. In view of the new single sheet form, only one set of E.C.G. strips would be cut and mounted.
- 4.2.9. The "Laminated Sellotape" used for mounting the strips should be housed on a tape dispenser for greater ease of handling.
- 4.2.10. The mounted tracing should be passed to the new E.C.G. typist for the reporting stage. She would attach to it file copies of previous tracings for comparison.
- 4.2.11. A central reporting service should be offered to all Units in the hospital by the Cardiac Department. Reporting would be done in the E.C.G. premises. Who actually would participate in reporting would be a matter for agreement among the medical staff of the whole hospital.
- 4.2.12. A rota should be drawn up so that one physician is specifically responsible for reporting at each session each morning and afternoon. The reports would be dictated on tape in a special reporting room.
- 4.2.13. The tape would then be played back by the typist in the adjoining typing room, who should have her own tape-recorder. She/

(cont)

- 4.2.13. She would type the reports on to the single forms and then feed each form through an electrostatic copying machine at her side.
- 4.2.14. Speedy despatch of the completed master copies should then be ensured by the provision of a messenger service, which the hospital badly needs for many purposes. On no account should completed E.C.G. sheets lie for more than an hour before despatch to the appropriate wards.
- 4.2.15. The electrostatic copy of the E.C.G. sheet would then serve as a file copy. Additional copies could be provided easily as required for any occasion.
- 4.2.16. In instances where an immediate report must be processed this should be dictated directly to the typist. Obviously, as the reporter must scrutinise the tracing as he speaks, and compare it with copies of previous tracings, direct typing on to the form is impossible, but, as the report will always be quite short, it can be taken down in shorthand and rapidly typed on to the form.
- 4.2.17. Should certain Units prefer to report their own tracings in their wards, then a file copy with no typed report could be made by the machine and the unreported master copy be forwarded to the Unit at that stage.

5. COST OF OPERATING A COPYING MACHINE

5.1. On the basis of the foregoing remarks, the balance sheet of the new procedures will be as follows:-

5.1.1. SAVED

- (a) Cost of E.C.G. paper (I)
- (b) Cost of Sellotape (II)
- (c) Cost of paper of present copy
page and carbon strip. (These
are not easily calculated and will
be ignored hereafter).
- (d) Technician's time (III)

5.1.2. NEW COST

- (a) Machine purchase/rental
 - (b) Machine running costs
- (IV)

5.2. SAVINGS

5.2.1. The Cardiac Department at present processes about 15,000 tracings per year. About half of these are 9-lead, the others 13-lead, so we shall henceforth consider all tracings in terms of a notional 11-lead series.

5.2.2. Each lead at present entails the use of one foot of recording paper on the original uncut E.C.G. strip. So by abolishing the present filte copy the paper saving will be:-

$$\frac{1}{2} (15,000 \times 11\text{ft}) \text{ p.a.} = 82,500 \text{ ft. p.a.}$$

E.C.G. paper costs 12/- per 100 ft.

So annual cost of paper saved = 12/- x 825

$$= \underline{\underline{\pounds 495}} \dots\dots\dots (I)$$

5.2.3. For a notional 11-lead mounting the Sellotape used=10.8ins
This particular Sellotape costs 22/- per 108 ft

$$\begin{array}{l} \text{i.e. } 22 \\ \hline 120 \end{array} \text{ /- per 10.8 ins.}$$

$$\text{So annual saving} = \frac{\pounds 22}{120} \times \frac{15,000}{20} = \underline{\underline{\pounds 137.10.-.}} \dots\dots (II)$$

- 5.2.4. One copy of a notional 11-lead tracing takes a technician not less than 3 minutes to mount.

So time saved in mounting only
 one copy = 15,000 x 3 mins. p.a.
 = 750 hours

A Rank-Xerox "914" copies approximately 100 sheets every 30 minutes.

So 15,000 sheets are processed
 in = 150 x 30/60 hours
 = 75 hours

So annual time saved by a technician = 750 - 75 hours
 = 675 hours (III)

5.3. NEW COST

- 5.3.1. We have considered briefly the types of copying machines available for the work required, and found that photocopying is time-consuming and the reproduction relatively poor, although the initial purchasing outlay is relatively small. We recommend an electrostatic method, and know at present of no better machine than the Rank-Xerox "914".

5.3.2. Annual rental of this machine = £360

5.3.3. Overall running costs (including paper) = 4d per sheet
 So for 15,000 tracings runnings cost = £250

5.3.4. So total machine costs p.a. = £610 (IV)

5.4. CONCLUSIONS

- 5.4.1. By adopting the new procedure and installing a Rank-Xerox "914" machine in the Department the annual saving will be at present:-

£495 + £137.10/- - £610
 = £22.10.-.

Plus 675 hours of a technician's time.

5.4.2. The latter should be used to speed the throughput of tracings rather than to decrease staff establishment.

5.4.3. In view of the increasing future demands on the E.C.G. services, especially as regards the "open-door" facilities for general practitioners (an unknown quantity at present), let us cost a throughput of 30,000 tracings per year in the same way.

I	Annual saving in E.C.G. paper	= <u>£990</u>
II	Annual saving in "Sellotape"	= <u>£275</u>
III	Annual saving in technicians' time	= <u>1350 hours</u>
IV	Total costs of copier = £360 (rental) .. + £500 (running)	= <u>£860</u>

So annual saving = £405 + 1350 technician hours (= $35\frac{1}{2}$ working weeks).

5.4.4. There is a Rank-Xerox "914" at present in the Records Department, but it is not available continuously on demand by the E.C.G. staff, nor is it geographically sited for the maximum convenience of the Cardiac Department. This machine at present copies E.C.G.'s from Knightswood and the Queen Mother's Hospitals, and we suggest that in future these tracings be copied in the Cardiac Department. (see paragraph 4.2.13.)

5.4.5. It could be argued that the machine in the Records Department could cope with the extra load at all times were an extra member of Records Staff available to operate it. The salary of such an extra member would, we suggest, equal or exceed the supposed economy in such an arrangement.

5.4.6. Training of all E.C.G. technicians in operating the new machine would be desirable, especially to provide cover for the typist's absence, and to help meet the training requirements in medical photography for the E.C.G. technical diploma.

5.4.7. The new copying machine in the Cardiac Department would also be useful for processing teaching pamphlets, examination papers, etc.

6. FILING SYSTEM

6.1. At present

- 6.1.1. Before 1963 E.C.G. records were filed annually in alphabetical order on 6" x 4" cards. Tracings were mounted on separate sheets. Each record was filed in an envelope for each patient (for that year).
- 6.1.2. In January 1963 the mounted tracings and reports were combined on a sheet 11" x 8" i.e. standard form size of the Western Infirmary case record. These records are filed in alphabetical order irrespective of year.
- 6.1.3. Records of patients who have not attended for five years are destroyed.
- 6.1.4. Each request for an E.C.G. is entered sequentially in an index book. This book serves as:-
- (a) a numbering index
 - (b) a report control index (i.e. date request in, date report out).
 - (c) a diagnostic index (based on the final report) using departmental code classification.
 - (d) a statistical return record.
- 6.1.5. The E.C.G. supervisor is at present responsible for all clerical duties including record filing.

6.2. Recommendations

6.2.1. Record Filing System

- 6.2.1.1. E.C.G. records should be filed annually in alphabetical order.
- 6.2.1.2. Return patients' previous E.C.G. records should be brought forward to the file of the present year, thus enabling all records remaining in file after five years' non-attendance to be destroyed, without further reference.
- 6.2.1.3. More shelf space should be provided to file five years of records. This merits further detailed study, if our general recommendations are accepted.

6.2.2./

6.2.2. Diagnostic Index

We suggest that a separate diagnostic index be introduced, using existing departmental codes, thus enabling a statistical breakdown of diagnoses to be produced; and immediate referral to all cases of a given condition to be made for research or teaching purposes. 5" x 3" cards might be used for this index, one card per diagnostic code number, recording the following information:-

Patient's name; unit file number; E.C.G. number;
hospital Unit.

6.2.3. Staffing

We suggest that, as already specified, a typist be employed to type E.C.G. reports, file records, and maintain the diagnostic index. This would free the supervisor from routine clerical duties.

7. GENERAL CONCLUSIONS

- 7.1. In our view the present E.C.G. services are inadequate as regards premises, staff numbers and mechanical equipment.
- 7.2. We have detailed suggestions for improving these and also for altering the work procedure.
- 7.3. We feel that the alterations at present proposed by the Board of Management are unacceptable.

8. ACKNOWLEDGEMENTS

For their help in supplying information for this report we wish to thank the staff of the Cardiac, Records and Stores Departments of the Western Infirmary; and for their helpful advice and criticism we thank members of the medical staff of the Western Infirmary, Royal Infirmary and Stobhill General Hospital, Glasgow.

9. APPENDIX

9.1. PRESENT E.C.G. REQUEST AND MOUNTING FORM

WESTERN
INFIRMARY
GLASGOW
W.1

CARDIAC DEPARTMENT

ELECTROCARDIOGRAPHIC
EXAMINATION

REQUEST		REPORT	
NAME	HOSPITAL No.	E.C.G. No.	Date
	AGE	Rate	Rhythm
	SEX	P	
	DEPT.	P-R Interval	
PHYS/		Q R S	
SURG.	WARD	S T	
	Previous E.C.G. No.	T	
Date		Comment	
Relevant Clinical Findings			
B.P.	DIGITALIS — Yes No		
Signature of Requesting Dr.		Signature	

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NUFFIELD RECORDS INVESTIGATION

9.2. COPY OF A MOUNTED E.C.G. BY A RANK-XEROX "914"

WESTERN
INFIRMARY
GLASGOW
W.1

X

REQUEST

REPORT

NAME [REDACTED] HOSPITAL No. [REDACTED]
AGE 51
SEX M.
PHYS/SURG. A. Macdonald DEPT. OPD. C9
WARD [REDACTED]

E.C.G. No. [REDACTED]/88 Date 4/2/88
Rate 75 Rhythm sin
P 0-24
P-R Interval 0-16
QRS -
ST low L & H.
T -
Comment Normal.

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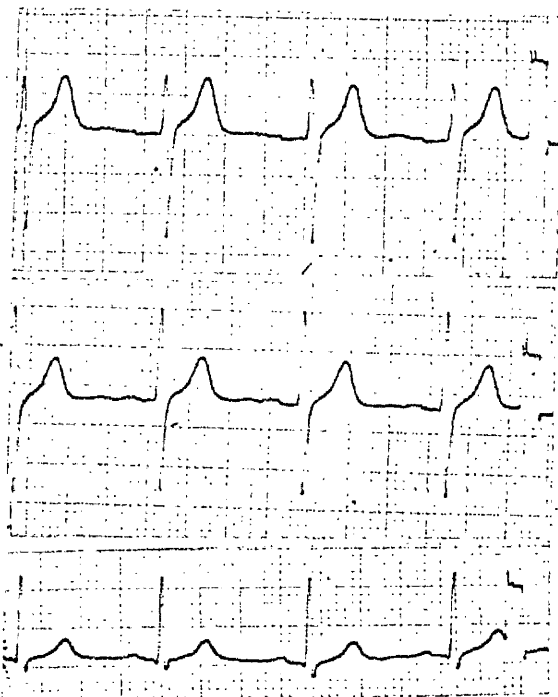
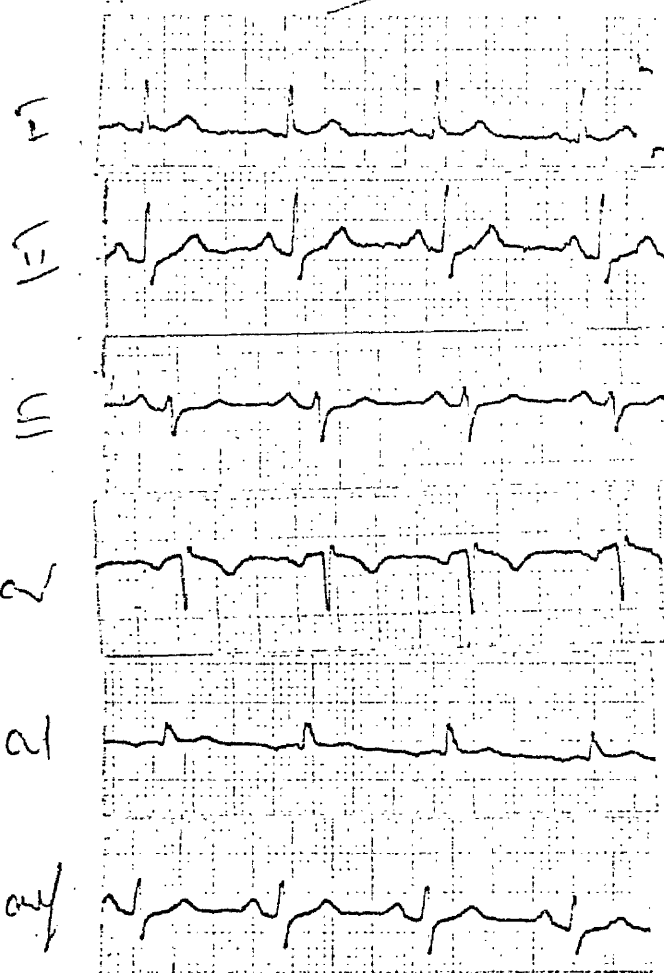
Date 4/2/85 Previous E.C.G. No. No.

Relevant Clinical Findings

Cardiomegaly

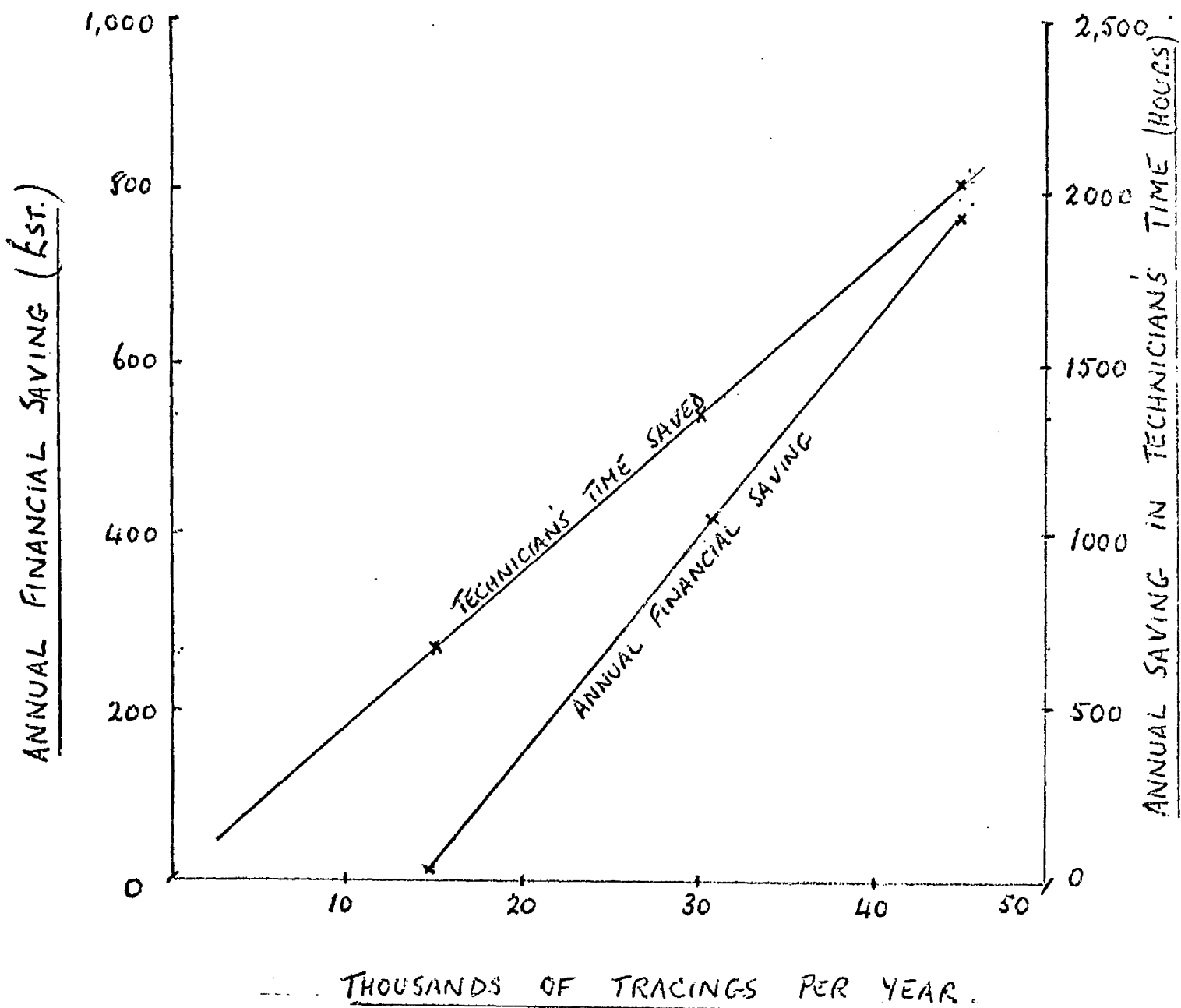
B.P. 100/60 DIGITALIS — No
Signature of Requesting Dr. [Signature]

Signature [Signature]



STUFFED RECORDS INVESTIGATION

9.3. GRAPH OF ANNUAL SAVINGS/TRACING THROUGHPUT
BY OPERATING A COPYING SERVICE.



II

SURVEY OF THE X-RAY DEPARTMENT,
WESTERN INFIRMARY, GLASGOW.

MAY, 1966

M.R.R.G. REPORT NO. 6

First published: June, 1966

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1. LOCATION

The main premises of the Department are in the basement of the Infirmary. X-Ray apparatus of the Department is also situated in the Casualty and Urological Departments, and all angiography is carried out in the Department of Surgery.

2. STAFF

2.1. Medical (Radiological)

4 Part-time Consultants (28 sessions in all)
2 Senior Registrars
5 Registrars

2.2. Nursing

Nil.

2.3. Radiographic

1 Tutor
3 Superintendents
5 Senior Radiographers
13 Junior Radiographers

2.4. Orderlies

2 (both part-time).

2.5. Secretarial

3 Secretaries
6 Clerks

2.6. Comments on Staffing

2.6.1. Registrars and Senior Registrars are frequently away from the Western Infirmary on locum or rotational work.

2.6.2. Radiological examinations are becoming more complex and more time consuming each year.

2.6.3. There has been no increase in secretarial staff for at least the past 15 years.

2.6.4. There is no adequate provision for sickness and holiday absences of members of the secretarial staff.

2.6.5. The secretaries and clerks are nominally seconded from the Records Department. Requests for temporary replacements of these staff are, therefore, directed to the Chief Records Officer, but are never adequately met. This aggravates the friction existing between the two Departments for other reasons. (See paragraph 6.4.)

3. WORK SPECIFICATION

3.1. Commitments

3.1.1. Western Infirmary

The main Department handles the bulk of in-and out-patient work. The apparatus in the Casualty Department serves both that Department and the Fracture Clinic, and angiography is done in the Department of Surgery.

3.1.2. Staffing of other hospitals

The following are staffed part-time with Radiologists from the Western Infirmary, but they have their own Radiographers:-

1. Royal Beatson Memorial Hospital
2. Homeopathic Hospital
3. Princes Square Medical Centre (X-Rays for the Regional Medical Officer).
4. Killearn Hospital

3.1.3. Locum Cover

Radiologists are seconded from the Western Infirmary, as necessary, to various other hospitals in the West of Scotland.

3.2. Hours of Work in the Western Infirmary

3.2.1. A Radiographer is always on the premises, available for emergency X-Ray examinations.

3.2.2. Routine examinations are accepted in the main Department on Mondays to Fridays from 9.00a.m. to 12.30p.m. and from 2.00p.m. to 4.30p.m., and on Saturdays from 9.00a.m. to 11.30a.m.

3.2.3. This necessitates fully staffing the Department on Mondays to Fridays continually from 9.00a.m. to 6.00p.m., to clear backlogs of work which invariably build up.

4. WORK LOAD

The following figures refer to all the X-Ray services in the Western Infirmary itself.

4.1. Patient attendances from 1950 to 1965

1950	...	...	43,988
1958	...	...	44,742
1960	...	...	48,618
1961	...	...	50,703
1962	...	...	51,912
1963	...	...	53,127
1965	...	...	55,089

4.2. Patient attendances in April 1966

X-RAY CATEGORY				ATTENDANCES
Chests	...	...	...	1,189
Bones	...	...	...	3,078
Gall-Bladders ¹	...	...	...	56
Urological..	...	...	...	304
Special Examinations.. (Aortograms, Splenograms, Lymphangiograms etc.)				34
Routine Barium ..	...	...	...	417
Examinations				
Double Contrast Enemas ²				24
Small Intestine .	...	...	...	3
Examinations				
Miscellaneous ...	...	...	...	107
(Chest Screenings, Dental X-Rays, etc.)				
TOTAL				5,212

1. A two-day examination

2. This examination takes one hour

4.3. Waiting Lists (For Routine Cases)

4.3.1. Overall

Barium examinations	3½ weeks
Urological examinations	2 weeks
Gall-bladder examinations	5 weeks

4.3.2. For Out-Patients

Barium examinations	4 weeks
I.V.Ps.*	6 weeks
Cholecystograms	8 weeks

4.3.3. Comment

4.3.3.1. The Department, because of shortage of Radiographers and of working space, cannot promptly meet all demands made upon it. Consequently, in order to cope promptly with orthopaedic examinations, and simple in-patient examinations requested by other specialties, a waiting list is created for the above-named special procedures.

4.3.3.2. Again, deliberately, the waiting list for out-patients is made longer than that for in-patients, to minimise unnecessary bed-occupancy.

4.3.3.3. It must be remembered that these special procedures involve, in every instance, prior preparation of the patient as regards diet, laxatives, etc., and, sometimes, screening by a Radiologist. Therefore, an appointments system is inevitable.

4.3.3.4. Moreover, for these very reasons, if a last-minute cancellation of such an appointment is made, the time cannot be then used to examine someone else in the same way. That is to say that time is virtually wasted.

4.3.3.5. Whilst deploring the existence of such a waiting list, we realise that having such is the only practical way of running the service at present.

* Intravenous Pyelograms.

5. ADEQUACY OF PREMISES.

5.1. Space and Equipment

- 5.1.1. More space and equipment for X-Raying patients is urgently needed in the main Department.
- 5.1.2. An outside door of the Department faces straight down the patients' waiting corridor.
- 5.1.3. Two dustbins stand in another main corridor because there is nowhere else to locate them.
- 5.1.4. The several rooms used for film storage are improvised adaptations of basement alcoves, and are cramped and dirty. One of them has several overhead electric light bulbs located in fixed sockets less than six feet from the ground, and these are consequently highly dangerous to personnel.
- 5.1.5. The storage space for card documents is makeshift and inconvenient, and the practice of storing cards in loose boxes on high shelves is highly inefficient, because of the difficulty of rapid referral to a particular card, and the frequency with which a whole boxful is dropped and then must be gathered and re-sorted.

5.2. Telephones

There are sufficient telephones in the Department but, as we have remarked elsewhere, the Infirmary switchboard should be changed to a PABX.3.

5.3. Intercom. Apparatus

The X-Ray Department and the adjoining Eye Department share a highly efficient intercom. network.

5.4. Tape Recorders

There are six of these, all mechanically unreliable.

6. DOCUMENT ORGANISATION.

6.1. X-Ray Films

- 6.1.1. Casualty Department films which have not been passed over to other Departments and are, therefore, almost invariably negative, are destroyed one month after each patient's last attendance.
- 6.1.2. The Orthopaedic Department (including Fracture Clinic) retain and file their own films.
- 6.1.3. All other films in the Infirmary are filed in the Main X-Ray Department. There are four rooms for this purpose, and films pass to each room in turn as they become progressively more non-current.
- 6.1.4. Storage envelopes in the main files are all the same size, and all the films of a particular patient, existing in file to date, are kept in the same envelope, which is to say that at each X-Ray attendance the envelope is up-dated.
- 6.1.5. Films in the main files are destroyed after three years of non-attendance at the Department by the patient.

6.2. X-Ray Cards

The request cards for films are filed separately, in numerical sequence, each with a copy of the Radiologist's report. This is especially useful if the films themselves are missing from file. The cards are destroyed after six years.

6.3. Master Index

A card alphabetical master index is employed to locate X-Ray Cards and films in store. Time does not permit the "weeding" of this index to keep it up to date.

6.4. Responsibility for Document Organisation

The Chief Records Officer has, from time to time, altered or tried to alter the storage furniture and the filing systems in the Department. This has given rise to considerable friction between the X-Ray and Records Departments.

7. SUMMARY AND RECOMMENDATIONS.

- 7.1. The Department at present is seriously over-committed. It cannot provide an adequate service as regards barium meals and enemas, I.V.P.s, and cholecystograms for which, particularly for out-patients, there is an unduly long waiting list.
- 7.2. This occurs because of shortage of radiographers and of working space.
- 7.3. The annual number of patient attendances has been steadily increasing for many years, and the examinations themselves are becoming more complex and more time-consuming.
- 7.4. It follows, therefore, that, unless the situation is drastically altered, the time will soon come when a serious breakdown will occur in the service offered by the Department.
- 7.5. We have seen correspondence from the Radiologist-in-Charge to the Board of Management repeatedly drawing attention to this situation during the past few years.
- 7.6. Apart from this major problem, it is apparent that the Departmental documents are not housed or handled in the most efficient way, but only as best they can be in the present circumstances.
- 7.7. We feel that more space should be provided for a single film store extending back for much more than the present three years.
- 7.8. We feel that the X-Ray cards themselves should be filed in proper cabinets, and that the master-index should be fully brought up-to-date. The Records Department should have no say in the matter.
- 7.9. Where possible, the lay-out in the Department should be altered to give the waiting patients more privacy, and to house more suitable dustbins in suitable cupboards or alcoves.

- 7.10. Some Nursing Staff should be always present in the X-Ray Department to assist with patient handling, particularly with regard to enemas and I.V.P.s, and to assist in the management of those patients who are already seriously ill or who become suddenly ill whilst in the Department.
- 7.11. The Department is operating in difficult circumstances and its staff are inevitably being blamed for deficiencies in the services over which they have virtually no control.

8. ACKNOWLEDGEMENTS.

We wish to thank Dr. Scott Park and Miss Bingham for their invaluable help in providing the information on which this memorandum is based.

CHAPTER FIVE.

S E C R E T A R I A L S E R V I C E S

"The availability to the consultant of a personal secretary is of the greatest benefit in permitting maximum clinical activity. Typing pools and tape machines cannot replace an efficient personal secretary who is able to organise a consultant's time and protect him from unnecessary calls and commitments."

(Scottish Home and Health Department, 1967)

" 'Dear Madam, We Ommitted to Obtain your Signature on Your N.H.S. form when Your Galsses were fitted. Will You Please Sign the form in the places Indecated, and return to use at your earliest Coneniece' — letter from a London firm of consulting opticians to a customer."

(Peterborough, 1967)

The Typing Pool.

As medical knowledge and expertise increase each year, so does the work load on a medical secretary, in terms of both volume and complexity. Unfortunately also, first-class secretaries are becoming more and more difficult to recruit, so the question arises of how best to resolve this dilemma of increasing work and decreasing availability of skilled labour.

The problem is common throughout industry and commerce, and is not confined to the United Kingdom. It is usually being tackled by the use of mechanical devices now widely available — electric and automatic typewriters, portable and remote recording machines, copying machines and line selectors — and by the general reorganisation of secretarial work routine. This has frequently resulted in

the replacement of personal secretaries by mechanised typing pools, or, as they are sometimes now euphemistically termed, "recording centres".

Suppose an organisation occupies a large building, and each executive, senior and junior, has a personal secretary whose duties include shorthand typing. It is logical to consider the centralising of this typing in a "pool" equipped with recording machines, preferably of the remote (telephonic) variety; this will result in a saving of 60% of typing costs (Assmann, 1966), a more even, and generally rapid throughput of work, and the automatic transfer of work when one or more members of staff is absent on holiday or during sickness.

It is possible to plan, organise and continually survey such a typing pool in a completely objective way, to reach and maintain a high rate of efficiency (Foster, 1966). Much detailed basic research has been done by a sales firm (Assmann, 1966), and special attention is now being paid to personnel aspects (Institute of Personnel Management, 1966; Warne, 1966). Certain facts have emerged which are highly pertinent to secretarial services in hospital.

If an audiotypist (50 words per minute) prepares 10 lines of text in 10 minutes, she will do 20 lines in 12 minutes and 30 lines in 14 minutes. She can type one long letter much faster than several short ones, though the total text length is the same. This is because of the time necessary to mount and dismount the paper,

and to type items other than text -- addresses, salutations, dates, reference marks and so on.

As the number of carbon copies per item increases, the typist's output drops, partly through caution, and partly because she takes 15 seconds more per carbon to mount and dismount the paper, and 30 seconds more per carbon for each correction. If the number of copies exceeds 1+3 it is cheaper for her to type a single copy and reproduce this on a dyeline machine.

A noisy environment lowers typing output by 10%, and an audiotyping pool can be expected to be noisy. This can be offset by wall-to-wall carpeting, heavy side curtains (plus thin net covering the glass itself to decrease direct reflection of sound), wooden rather than metal desks, and upholstered chairs. Even if this costs £60 per typist, the capital cost will be regained, in terms of output, within one year.

If the number of audiotypists in a pool exceeds twelve, supervision becomes difficult, and several small teams are better housed separately. Psychological factors play a large part in staff morale and efficiency, and many firms have found it profitable to devote special care to the decor in an audiotyping room, and to provide a rest alcove for staff who are idle for a few minutes. Similarly, attention to the convenient placing of machinery in and on desks, to the heights of working surfaces, to the comfort of typist's chairs, and to the efficiency of both the recording machines

(such factors as automatic input volume control, and clarity of reproduction) and the dictators themselves (audio-dictation is an art in itself) have all been found to be valuable in counteracting the high turnover of staff which is otherwise always a feature of audiotyping pools.

Although an audiotypist does not need to use shorthand, and is therefore intermediate in status between a copy and a shorthand typist, it may be wise to offer her a salary bonus for possessing shorthand skill; otherwise she may leave to work elsewhere, or, if she stays, she may be resentful that her personal talents are being undervalued.

An audiotypist in a pool is geographically remote from dictators, so she may have to type a wide variety of texts and at the same time be unable to seek guidance verbally about particular terms she finds difficult to translate. This can be resolved by supplying her with a special glossary of such terms, and with a standard English dictionary, and by making sure that each time she does make a mistake she writes out the correct term in an address book. This in itself tends to imprint the correct version in her mind.

Other Secretarial Duties.

In recent years the word "secretary" has become debased to a status symbol, and often means nothing more than "typist" or "clerk". This has thoroughly confused the issue, and explains the

ease with which typing pools have so often perfectly well replaced "personal secretaries".

It has been neatly, too neatly, argued that most personal secretaries can be replaced by a typing pool. One particularly reasoned case (Assmann, 1965) has pointed out that a secretary's duties "may include" shorthand typing, filing, clerical work, reminding her boss of appointments, taking messages in his absence, acting as messenger, acting as hostess and servant, and providing companionship (sic!). Typing, it is argued, can be centralised in a pool, filing can be done by a peripatetic clerk (paid less than a typist), messages can be carried by a special messenger staff, and appointments can be made, and messages received by typing pool personnel. On the same theme (Institute of Personnel Management, 1966) "all travel arrangements and theatre bookings are dealt with by reception."

The argument runs that, having taken away, and centralised the individual secretary's typing duties, the rest of her activities can be easily and more efficiently removed and reorganised, so that she herself becomes redundant. When this is true I suggest that there was never a need in the first place for a personal secretary, who should properly be a personal assistant with sufficient skill, tact and aptitude to allow her boss to delegate tasks (often confidential) to her in the same way as a battalion commander in the Army does to his adjutant.

I note with some cynicism that already the functions of typing pools are becoming blurred by mushroom growth, and that centralisation is the one remaining theme. The "Secretarial Centre" is being suggested (Assmann, 1965) as a development of the "Recording Centre" (alias typing pool) with Typing, Messenger, Information, Filing, and Clerical Sections, which will handle everything from knowing the right time to watering house plants in offices and supplying electric light bulbs. The term "Progress Clerk" is now used for an audiotypist who will, part-time, specially attend to non-typing secretarial duties for different executives.

It seems that there is a real danger of the centralisation of secretarial services becoming a dogma, and it is thoroughly alarming when such centralisation is being enthusiastically advocated and ruthlessly pursued by many hospital authorities.

Unit Typing in Hospital.

My own findings show that the typing load of a Unit secretary varies greatly from day to day, and that this is largely due to many letters being dictated to her soon after each out-patient clinic. Her typing input may be represented graphically by an oscillating line, so :-



Now a typing pool's input will consist of many such wave

forms, each out of phase with the other, and summing to a near-straight line: this is one of the arguments in favour of such a pool. A Unit secretary can flatten the oscillations by breaking up the batches of work, but this is undesirable because all the letters should be despatched as soon as possible, and not be delayed just to make the typist's life easier.

Recording equipment of whatever type has the great advantage of making the dictator and the typist independent of each other in terms of both time and place, except that the item of recording (tape, disk, etc.) and the unit file have to be physically transported to the neighbourhood of the typewriter, and the completed letter and unit file back to the dictator, and this raises transport problems (see later). Some would argue that the presence of the unit file is not necessary when letters are typed, but I would disagree. In the first place the typist can read the identification particulars of the patient and the general practitioner directly from the file, as well as the admission and discharge dates, and these need not be dictated, with all the consequent dangers of spelling errors; and in the second place the letter copy can be mounted in the file by the typist there and then, and the file and master copies can both be corrected as necessary by the dictator at the same time as he signs the master.

Centralising recording equipment in a bank operated through a hospital telephone system has the great virtue of providing

multiple access points for dictators, which is very useful in a widely scattered hospital, but the problem of transport of documents becomes correspondingly more complex.

Quality of Typing.

The arguments in favour, and against centralising typing services in hospital have been admirably presented by the Ministry of Health (1959), and one of the advantages claimed for a pool is that therein "new entrants can be helped and trained more easily". I have found that such "training" may consist of time-serving per se, in the fond hope that with passing time comes personal skill. It is an unfortunate and unwelcome fact that the standard of medical typing in hospital leaves very much to be desired, and this is, I think, largely due to the lack of formal training of staff. If a girl has shorthand typing ability in the non-specialist field it is happily assumed that she will "pick up" the medical terms.

The results are funny or tragic (or both) depending on the reader's point of view, but the following personal gems are worth quoting:-

- (a) "Your patient has diabetes mellitus and would be best admitted for sterilisation."
- (b) "The differential diagnosis includes a wee bit dysentery".
- (c) "Her breathlessness is due to excessive copulation".

The correct terms are, respectively, stabilisation, amoebic and corpulence, though whether this would be immediately apparent

even to medical readers is doubtful.

The results of a trial mechanisation of the typing pool of one particular hospital are worth considering in detail, as a remarkable example of how the advantages of machinery can be minimised by human factors.

TELEPHONE DICTATION IN CLINICS:

Comments on two trials in Stobhill General
Hospital, Glasgow, in 1966.

M.R.R.G. REPORT NO. 19

First published: April 1967.

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1. INTRODUCTION

- 1.1. Early in 1966, a firm which manufactures and markets dictation equipment approached the Medical Records Research Group with an offer to supply and install telephone dictation equipment in the typing pool of any suitable hospital for a trial period of several weeks.
- 1.1.1. This offer would involve the hospital in no expense whatsoever, nor in any obligation to subsequently purchase such equipment.
- 1.1.2. The firm thought of it as an advertising demonstration on a large scale, and hoped it would be mutually informative.
- 1.2. After some discussion, we decided that the existing typing pool at Stobhill Hospital could be easily mechanised for the purpose of the demonstration, and such was arranged.
- 1.3. Later in the year, a second firm made a similar offer, specifically with regard to Stobhill Hospital, and this too was accepted.
- 1.4. We hoped that the installation of telephone dictation equipment would interest the medical staff, and we wondered if the statistical results of the two trials would in any way confirm the theoretical advantages of such equipment.
- 1.5. Unfortunately, as we shall show, the results did not do this, but were very revealing in other ways.

2. METHODS

2.1. The Basic Situation

- 2.1.1. In Stobhill Hospital the various out-patient clinics were served by a typing pool which was housed adjacent to the Out-Patient Department.
- 2.1.2. The staff in the pool typed all correspondence items relating to out-patient attendances in this Department, but were not responsible for filing investigation reports in the patients' records. That is to say, the staff were strictly "typists", and not "secretaries" in the true sense of the word.
- 2.1.3. Correspondence and other secretarial work relating to in-patients were dealt with by the various Unit Secretaries throughout the hospital.
- 2.1.4. Newcomers to medical secretarial work were introduced into the hospital via the typing pool, and Unit Secretaries were recruited from the pool.
- 2.1.5. The typing pool was, therefore, deliberately organised as a training ground for new medical secretarial staff joining the hospital.
- 2.1.6. Letters were presented to the pool for typing in three ways:-
- (a) Most clinicians visited the pool and dictated to a typist, who recorded in shorthand.
 - (b) A few clinicians summoned a typist from the pool to other parts of the hospital, to take shorthand dictation.
 - (c) A small number of individual dictation machines of various types were available for recording out-patient letters. They were used by a few clinicians.
- 2.1.7. The typing pool was managed by a non-typing supervisor who, supposedly, checked all finished letters for errors before they were referred to the authors for signature. She might decide, if she saw fit, to order letters of poor quality to be completely re-typed.

2.2. Equipment Installed for the Trials

2.2.1. In the first trial the following extra* equipment was installed:-

- (a) Ten telephone handsets at various locations in the Out-Patient Department. Each handset had a series of control buttons to enable the dictator to stop and start a remote recorder, to reverse the recording disk, to mark the letter length, to signal the end of dictation, and to speak directly to a typist in the pool.
- (b) Telephone cable, linking these handsets to recorders in the pool, temporarily taped to the walls of the building, so as not to damage the decorations.
- (c) A "bank" of four recorders in the pool, governed by an automatic selector, so that a handset newly brought into use would "find" a recorder not already engaged.
- (d) Six transcribing machines in the pool, which played back the recordings to the individual typists.
- (e) Four individual recorders as supplementary equipment. Three were situated in the Out-Patient Department, and one in the dictation room of the pool. They were not telephonically linked, and the recording disks had to be mounted on and removed from the machines, and transported to and from the typists manually.

2.2.1.1. The recording medium in this trial was a double-sided electro-magnetic disk, which had a total useful life of some 50,000 recordings.

2.2.2. In the second trial the following extra* equipment was used:-

- (a) Ten telephone handsets in the Out-Patient Department.
- (b) Temporary cable link to recorders in the pool.

* The dictation machines present before the first trial were not removed.

(c) A "bank" of four recorders in the pool,
governed by an automatic selector.

(d) Six transcribing machines in the pool.

2.2.2.1. The recording medium in this trial was a one-sided non-magnetic belt, which gave a once-for-all permanent recording.

2.3. Organising the Trials

2.3.1. In both trials, members of the firms concerned installed the equipment, guided clinicians in its use, and gathered statistical results.

2.3.2. We left the latter task to them, because they were used to doing it, because they preferred to do it themselves, and because they had to be readily available anyway to help dictators and to rectify possible mechanical faults in the equipment.

2.3.3. We must emphasise that all clinicians who used the dictation equipment did so voluntarily, and no one was prevented from giving shorthand dictation to a typist if he preferred to do so, nor from using one of the pre-existing dictation machines.

3. RESULTS

3.1. Before the First Trial

3.1.1. A survey was carried out by the firm for four weeks before the installation of equipment in the first trial, to determine the individual and total output of the typists in the pool.

3.1.2. The individual figures were as follows:-

TYPIST'S OUTPUT, SPECIFIED AS LETTERS/LINES*				
5-DAY WEEK ENDING	20TH MAY	27TH MAY	3RD JUNE ^x	10TH JUNE
TYPIST A	74/518	128/1079	52/573 [/]	200/1315
TYPIST B	68/599	105/937	107/984	113/1089
TYPIST C ^p	23/102	NIL	NIL	33/224
TYPIST D	44/519	90/836	79/822	102/790
TYPIST E	83/731	116/933	142/1021	132/1417
TYPIST F	82/711	130/1407	111/1035	183/1732
TYPIST G	50/484	94/920	35/306	NIL ^r
TOTAL	424/3664	663/6112	526/4741	763/6567

* Lines measured as lines of finally corrected letter text. Letter headings, salutations etc., envelope texts, and re-typed items not included.

^x Four-day week because of Public Holiday.

[/] Three-day week.

^p Part-time.

^r Resigned.

3.1.3.

The total figures were as follows:-

Four week total output = 2,376 letters
or
21,084 lines

Average total weekly output = 5,271 lines

Average total daily output = 1,054 lines

Notional staff = 6.5 typists

Average daily output per typist = 162 lines

3.2. During the First Trial

3.2.1. The dictation equipment was installed for four weeks.

3.2.2. The individual output figures were as follows:-

'TYPIST'S OUTPUT, SPECIFIED AS LETTERS/LINES*				
5-DAY WEEK ENDING	17TH JUNE	24TH JUNE	1ST JULY	8TH JULY
TYPIST A	137/1021	123/1158	141/979	91/977 ^x
TYPIST B	92/891	128/1210	121/1060	101/948
TYPIST C	122/1148 ^f	44/324 ^p	23/155 ^p	55/397 ^p
TYPIST D	77/811	86/934	53/537	117/1183
TYPIST E	114/1093	154/1243	75/885	NIL ^h
TYPIST F	NIL ^h	163/1732	98/852 ^x	193/1395
TYPIST H	91/732	81/793	54/634	93/884
TOTAL	633/5696	779/7394	565/5102	650/5784

* Measured as before (See paragraph 3.1.2.).

^x Four-day week.

^p Part-time.

^f Full-time.

^h On holiday.

3.2.3.

The total figures were as follows:-

Four week total output = 2,627 letters
or
23,976 lines

Average total weekly output = 5,994 lines

Average total daily output = 1,199 lines

Notional staff = 6.5 typists

Average daily output per typist = 184 lines

3.2.4.

The extent to which the trial equipment was used is shown by the following figures:-

WEEK ENDING	LETTERS TYPED			
	WHICH WERE DICTATED USING TRIAL EQUIPMENT		WHICH WERE DICTATED BY OTHER MEANS	TOTAL
	DICTATION TIME*	NUMBER		
17TH JUNE	5 hr. 17 min.	313	320	633
24TH JUNE	3 hr. 52 min.	262	517	779
1ST JULY	4 hr. 5 min.	279	286	565
8TH JULY	5 hr. 26 min.	480	170	650
TOTAL	18 hr. 40 min.	1334	1293	2627

* This was the playing time of the disks. The amount of disk-time which was blank due to dictators collecting their thoughts was negligible.

3.3. During the Second Trial

3.3.1. The dictation equipment was installed for four weeks.

3.3.2. The individual output figures were as follows:-

TYPIST'S OUTPUT, SPECIFIED AS LETTERS/LINES*				
5-DAY WEEK ENDING	21ST OCT.	28TH OCT.	4TH NOV.	11TH NOV.
TYPIST A	126/1512	131/1012	139/1244	138/1348
TYPIST B	130/1362 ^x	128/1382	126/1255	156/1305
TYPIST C ^p	45/278	22/182	38/363	69/725
TYPIST J	116/724	114/824	115/973	106/649
TYPIST K	80/565	88/478	76/640	70/407
TYPIST L	93/613	77/480	83/651	103/745
TYPIST M	66/546	59/478	64/498	71/667
TYPIST N ^p	43/315	62/291	13/78	39/301
TOTAL	699/5915	681/5127	694/5702	755/6147

* Measured as before (See paragraph 3.1.2.).

^x Four-day week.

^p Part-time.

3.3.3.

The total figures were as follows:-

Four week total output = 2,826 letters
or
22,891 lines

Average total weekly output = 5,723 lines

Average total daily output = 1,145 lines

Notional staff = 7 typists

Average daily output per typist = 164 lines

3.3.4. The extent to which the trial equipment was used is shown by the following figures:-

SAMPLE	LETTERS/LINES* TYPED		
	WHICH WERE DICTATED USING TRIAL EQUIPMENT	WHICH WERE DICTATED BY OTHER MEANS	TOTAL
DAY 1 ⁺	126/1246	70/510	196/1756
DAY 2 ^x	75/464	70/529	145/993
TOTAL	201/1710	140/1039	341/2749

* Measured as before (See paragraph 3.1.2.)

⁺ An unusually busy day.

^x An average day.

3.3.5.

The amount of time spent in completely re-typing letters, (no matter how they were dictated) because of mistakes, is indicated by the following figures:-

SAMPLE	DAY 1 [/]			DAY 2 [/]			TOTAL		
LETTERS/ LINES*	FIRST TYPE	RE- TYPE	TOTAL	FIRST TYPE	RE- TYPE	TOTAL	FIRST TYPE	RE- TYPE	TOTAL
TYPIST A	40/ 432	8/ 149	48/ 581	39/ 283	5/ 80	44/ 363	79/ 715	13/ 229	92/ 944
TYPIST B	20/ 309	2/ 36	22/ 345	d	d	d	20/ 309	2/ 36	22/ 345
TYPIST C ^p	18/ 159	2/ 40	20/ 199	d	d	d	18/ 159	2/ 40	20/ 199
TYPIST J	47/ 392	3/ 52	50/ 444	45/ 304	6/ 48	51/ 352	92/ 696	9/ 100	101/ 796
TYPIST K	28/ 267	5/ 62	33/ 329	16/ 65	4/ 25	20/ 90	44/ 332	9/ 87	53/ 419
TYPIST L	8/ 45	5/ 55	13/ 100	17/ 176	9/ 70	26/ 246	25/ 221	14/ 125	39/ 346
TYPIST M	26/ 139	2/ 11	28/ 150	15/ 90	6/ 37	21/ 127	41/ 229	8/ 48	49/ 277
TYPIST N ^p	9/ 13	1/ 19	10/ 32	13/ 75	NIL	13/ 75	22/ 88	1/ 19	23/ 107
TOTAL	196/ 1756	28/ 424	224/ 2180	145/ 993	30/ 260	175/ 1253	341/ 2749	58/ 684	399/ 3433

* Measured as before (See paragraph 3.1.2.)

[/] As in paragraph 3.3.4.

p Part-time.

d Day off.

3.3.5.1. That is to say that, on two particular days when the pool staff output was 399 letters, totalling 3,433 lines, 58 letters (14.5%) totalling 684 lines (19.9%) were not being typed for the first time.

4. DISCUSSION

- 4.1. We have to admit that, from the statistical viewpoint, these trials were excellent examples of bad planning.
- 4.2. Mechanisation of a typing pool will not show a rise in typing output unless the mechanisation happens to enable a back-log of material to be cleared.
- 4.3. Mechanisation should, however, show a faster throughput of letters. The throughput rate in these trials was not measured, but enquiry suggested that it was only slightly faster.
- 4.3.1. We were appalled, during the course of both trials, to discover that the reason for this was that material dictated on to the recording media in both trials was transcribed by the typists into shorthand before being typed.
- 4.3.2. This, we were informed, was necessary so that the typists could maintain their shorthand accuracy and speed, and our pleas that this practice be abandoned for the purpose of the trials were strongly resisted.
- 4.3.3. We were told, moreover, that all letters which were recorded on the few dictation machines which were permanently available in the Out-Patient Department were transcribed into shorthand by the pool staff before they were typed.
- 4.3.4. We feel that further comment on this absurd practice is superfluous.
- 4.4. Many other factors affecting these trials were not, and could not be controlled by us.
- 4.4.1. The high rate of typist replacement, and the variable holiday incidence made meaningful detailed comparisons nearly impossible between the original situation and those prevailing during the trials.
- 4.4.2. The fact that certain clinicians continued to use the hospital's own dictation equipment, and/or dictate to a typist taking shorthand, introduced another unacceptable variable.
- 4.5. We feel, however, that the figures revealed two very important features of this typing pool.

- 4.5.1. Firstly, every typist had a quite unacceptably low output. A commercial audio-typist is expected to produce an average of at least 800 lines/day and a medical audio-typist an average of at least 420 lines/day*, yet the various tables show that even this latter figure was nowhere nearly reached.
- 4.5.1.1. We can only conclude that the typists were seriously underemployed, either due to being over-numerous, or to being inefficiently employed (such as in wasteful shorthand transcriptions).
- 4.5.2. Secondly, the re-typing rate (paragraph 3.3.5.1.) was unacceptably high, especially as our personal scrutiny of many of the finally re-typed letters convinced us that even their accuracy left much to be desired.
- 4.6. The argument that this typing pool was employed as a training ground for new staff seems to us to be irrelevant. It suggests that new typists were trained at the expense of efficient processing of out-patient correspondence.

* These are generally accepted norms.

5. SUMMARY

- 5.1. Two trials of telephone dictation equipment in a previously non-mechanised typing pool, serving a busy out-patient department, are described, and the statistical results are discussed.
- 5.2. The figures show that the trials were badly planned from a statistical viewpoint, but they also show that the typing pool was overstaffed and badly organised, and that the standard of typing was very poor.
- 5.3. We feel strongly that inadequately trained medical typists should not be employed in the way described.

6. ACKNOWLEDGMENTS.

We wish to thank all members of staff of Stobhill General Hospital who so willingly co-operated in these investigations, and Assmann Dictation Systems, Ltd., and Dictaphone Company, Ltd., who kindly provided equipment, staff and statistical assistance during the trials.

Unit Clerking in Hospital.

It is often argued that a great deal of routine clerking is done in wards and clinics by skilled personnel, which could more properly be done by special clerks. This has been tried in practise in one local hospital (Anderson, 1966) where a clerkess* was employed :-

1. Attending the ward round.
2. Filing laboratory and X-Ray reports.
3. Assembling and editing nurses' loose-leaf notes.
4. Making bed-state returns for the records officer.
5. Assembling case papers for new in-patients and matching them with previous notes and X-Rays.
6. Inserting new sheets as necessary in case notes, and heading them (patient's name etc).
7. Checking supplies arriving from the pharmacy department.
8. Writing summaries of patients' conditions.
9. Arranging flowers.
10. Distributing patients' mail.
11. Arranging inter-ward transfers.
12. Writing request forms for laboratories etc.
13. Writing off-duty lists for nursing staff.
14. Writing daily and weekly requisitions for supplies.
15. Answering the telephone.

* This is a Scotticism.

These duties obviously involved close liason with the nursing staff and required a clerkess to have a certain knowledge of ward routine, and it is interesting to note that one reason the scheme was discontinued was the hostility towards it of the hospital matron.

"Nursing unit clerks" are often employed in North American hospitals, but there they are usually promoted from being nursing aides and they are responsible to the head nurse, so their background is in the area of auxiliary nursing rather than clerical work. It may be significant that some foresee these clerks evolving to "ward secretaries" (Richmond, 1966).

The fact is that the division of hospital secretarial work into typing and clerking can be highly artificial and it may be better that one person perform both duties. This is illustrated in the following report.

ROBROYSTON HOSPITAL ANTE-NATAL CLINIC.

An enquiry into the clerical services.

M.R.R.G. REPORT NO. 20.

First published: April 1967.

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1. INTRODUCTION

- 1.1. Early in 1967, Dr. Harper, Consultant-in-charge of the Obstetric and Gynaecology Unit of Robroyston Hospital, Glasgow, asked the Group Medical Records Officer of Glasgow Northern Hospitals to reorganise the clerical services of his ante-natal clinics. It was obvious that this would include increasing the clerical staff.
- 1.2. The Medical Records Research Group was asked to assist at this stage, and did so by surveying the present work load and clerical procedures of the clinics, and recommending certain improvements; and also by lending the clinics a Secretary (experienced in typing), and two portable tape recorders, for a period of two weeks.

2. ORGANISING THE ENQUIRY.

2.1. The Basic Situation.

2.1.1. Clinic times.

DAY	TIME	HOSPITAL CLINIC	OTHER CLINICS*
Monday	a.m.	Ante-Natal	Barlia Drive Ante-Natal Clinic
Monday	p.m.	Post-Natal	-
Tuesday	a.m.	Ante-Natal	Provan Ante-Natal Clinic
Tuesday	p.m.	Ante-Natal	Mount Florida Ante-Natal Clinic
Wednesday	p.m.	Gynaecology	-
Thursday	p.m.	Ante-Natal	Callander Street Ante-Natal Clinic
Friday	-	Nil	-

* These Clinics are attended by medical staff from the Hospital. Patients from them may be booked for admission at some stage in pregnancy, and they will then have relevant record documents drawn up by the clerical staff at the Hospital Ante-Natal Clinic.

2.1.2. Clinic attendances (Hospital only)

Month 1966/67	Ante-Natal		Post-Natal Total	Gynaecology*	
	New	Return		New	Return
Sept.	109	462	29	-	-
Oct.	137	448	56	-	-
Nov.	174	459	45	-	-
Decr.	130	504	35	1	-
Jany.	145	530	48	1	-
Feby.	162	350	30	9	3
TOTAL	857	2,753	243	11	3
Monthly Average	143	459	41	-	-

* This Clinic was started in December 1966, and attendances will increase greatly in the next few months.

2.1.3. Present Clerical Staff

One clerkess/shorthand typist is at present employed at the Clinic. She works Mondays to Fridays from 8.45a.m. to 5.15p.m. with a 60-minute lunch break, i.e. a notional working week of $38\frac{3}{4}$ hours.

2.1.4. Present Clerical Duties

- (a) Clinic reception.
- (b) Documentation of medical records.
- (c) Preparation of return clinics.
- (d) Filing:
 - (i) Case folders in Ante-Natal Clinic file.
 - (ii) Post-Natal case folders in Records Office file.
 - (iii) Laboratory reports in case folders.
 - (iv) Master index cards.

2.1.4.1. These duties will be considered in detail in later sections of this Report.

2.2. Terms of Reference

- (a) To examine the work done by the one clerkess/shorthand typist in the Clinic, and to recommend improvements in the present procedures.
- (b) To assess the work involved in typing letters concerning Clinic patients.

2.2.1. At present, general practitioners are informed by pro formae that their patients are being booked for confinement in the Hospital. There are no routine arrangements for letters concerning Clinic patients to be typed, although, on occasion, letters of urgent importance have been typed by the Unit Secretary.

2.3. Methods of Enquiry

2.3.1. A brief examination of the present work load and procedures, which involved observation and questioning of various members of staff in the Clinic.

2.3.2. Lending the Clinic a medical secretary for two weeks, together with two tape-recorders, one for dictation and one for transcription. This secretary typed all routine Clinic letters (See paragraph 10.1.4.) making an extra carbon copy of each so that line counts could be made later by the Group Staff. She also assisted in the other clerical procedures of the Clinic.

3. DOCUMENTATION OF MEDICAL RECORDS

3.1. Present Procedure

The Ante-Natal Clinic clerkess at present proceeds as follows:-

- 3.1.1. Receives request form for patient appointment/booking.
- 3.1.2. Passes on Gynaecology Clinic letters to the Unit Secretary.
- 3.1.3. Makes up a case folder for each letter received, whether or not the patient already has a hospital unit file.
- 3.1.4. Types (unless stated otherwise) documents for the case folder of each patient, as follows:-

DOCUMENT	INFORMATION RECORDED
3.1.4.1. Front cover of case folder (hand-written)	Name and Hospital Unit Number*
3.1.4.2. Front sheet	Name; Unit Number; address; age; G.P.'s name and address; ante-natal care Physician's name.
3.1.4.3. Obstetric history sheet.	Name; age; gravida; referred by; Unit Number.
3.1.4.4. Laboratory report sheet	Name; age; Unit Number.
3.1.4.5. Master index card	Name; age; date of birth; sex; Unit Number; address; date of first appointment.

*The Hospital Unit Number is hand-written on all these documents as a second procedure (see paragraphs 3.1.8. and 3.1.9.).

DOCUMENT

INFORMATION RECORDED

-
- | | | |
|----------|------------------|---|
| 3.1.4.6. | Appointment card | Name; address; appointment date and time. |
|----------|------------------|---|
-
- | | | |
|----------|-----------------------------------|---|
| 3.1.4.7. | Letter to patient
(stencilled) | Name; appointment date, day and time; envelope with patient's name and address. |
|----------|-----------------------------------|---|
-
- | | | |
|----------|--------------------------------|---|
| 3.1.4.8. | Letter to G.P.
(stencilled) | G.P.'s name; patient's name and address; envelope with G.P.'s name and address. |
|----------|--------------------------------|---|
-
- 3.1.5. Studies each letter to ascertain the following:-
- 3.1.5.1. Information of past illnesses, in particular previous attendances at Robroyston Hospital.
- 3.1.5.2. Expected complications of pregnancy, and expected date of delivery.
- 3.1.5.3. Whether a request has been made for the patient to see any particular Consultant.
- 3.1.5.4. Distance the patient has to travel (so that she may be given the most suitable appointment time).
- 3.1.6. Decides, as a result, on which clinic day the patient should attend; and makes an appointment accordingly, entering the patient's name and address on the appointments list.
- 3.1.7. Enters the date and time of the appointment on the master index card, appointment card and stencilled letter to the patient.
- 3.1.8. Assigns a Hospital Unit Number to each case folder from a special block of numbers assigned to the Ante-Natal Clinic by the main Records Department.

3.1.9. Records this Unit Number at this stage by hand on all the relevant documents, namely:-

- Case folder (front cover)
- Front sheet
- Obstetric history sheet
- Laboratory report sheet
- Master index card.

3.1.10. Files the completed case folder in a special drawer, in day and date order, pending the patient's visit.

3.1.11. Places the appointment cards and letters in envelopes and posts them to the patients.

3.1.12. Places all the master index cards in alphabetical order, prior to filing them in the main index file in the Records Department.
This latter task is completed when she has sufficient time.

3.2. Comments

3.2.1. Re paragraph 3.1.2. The Ante-Natal Clinic clerkess should be responsible for making all appointments.

3.2.2. Re paragraph 3.1.3. This procedure is carried out without reference to the master index in the Records Department, which undoubtedly causes a great deal of duplication of Unit Numbers, clerical time and materials. It is essential that reference to the master index be made before any patient's documentation be begun.

3.2.3. Re paragraphs 1.4.6. and 1.4.7. The information recorded on both these documents is identical. We would recommend the abolition of the stencilled letter and the re-design of the appointment card. The appointment card should be so designed that the patient's name and address are placed in a position to allow the use of a standard window envelope.

3.2.4. Re paragraph ^{3/}1.4.8. The Consultant-in-charge (Dr. Harper) wishes to stop using the stencilled letter for this purpose, and to send instead a typed individual letter for each new patient and, thereafter, as necessary.

3.2.5. Re paragraph 3.1.6. The practice of entering the patient's name and address on the appointment list is unnecessary and time-consuming. Only the name and unit number should be recorded.

4. PREPARATION OF CASE FOLDERS FOR RETURN CLINICS

- 4.1. All case folders of those patients currently attending the Ante-Natal Clinic are stored in alphabetical order in two filing cabinets in the Clinic.
- 4.2. One of these two cabinets holds the records of those patients who have been pregnant for seven months or more. Each evening, porters transport all the records in this cabinet to the maternity duty room, so that the case folders of any patients admitted during the night will be readily available to the ward staff. The files are returned to the Clinic each morning.
- 4.3. On the day before a clinic session, the clerkess draws the next day's appointment list from the appointments tray, and, using this list, pulls the relevant documents from the two filing cabinets. She places these folders in alphabetical order for ease of reference when the patient attends.

5. LABORATORY REPORTS.

5.1. Present Procedure

5.1.1. When laboratory tests have been completed, the reports are returned to the clerkess in the Clinic for filing in the case folder.

5.1.2. The reports are generally scanned by the Nursing Staff, before filing, so that any abnormal results may be brought to the attention of the Medical Staff.

5.2. Comments

5.2.1. The filing of laboratory reports of patients whose case records are no longer stored in the Clinic presents a serious problem.

5.2.2. In the first place, the patient's Unit Number is seldom quoted on the laboratory reports (although it is always given on the request forms), so that tracing the relevant case folder involves consulting the hospital master index. Tracing a single patient in this index from only a name and age (not date of birth) can be difficult.*

5.2.3. Secondly, there is a continuous battle as to whether the responsibility for filing these reports is that of the Ante-Natal clerkess or the Records Department Staff.

5.2.3.1. Probably because of this a large number of these reports were awaiting filing at the time of our enquiry.

*Numerous patients have the same name and age.

6. POST-NATAL CASE RECORDS

6.1. Present Procedure

6.1.1. On completion of the hospital discharge letter all records from the Maternity Unit are returned to the Ante-Natal Clinic.

6.1.2. The Clinic clerkess separates these records into two categories.

(a) normal deliveries

(b) complications of delivery

6.1.3. Records in category (a) are returned to the main Records Department where they must be filed by the Ante-Natal Clinic clerkess, when she has time.

6.1.4. Records in category (b) are laid aside until the Obstetric Registrar codes each diagnosis.

6.1.5. Records of patients booked to attend the Post-Natal Clinic at the Hospital are removed from the Records Department files on the day before their appointment.

6.2. Comments

6.2.1. The Ante-Natal Clinic clerkess claims that she has insufficient time during working hours to file these records in the Records Department. Consequently, a large backlog tends to build up.

6.2.2. The Records Department Staff on the other hand claim that they are unable to file them for the same reason.

7. DIAGNOSTIC INDEX

7.1. Present Procedure

- 7.1.1. The Obstetric Registrar (further to paragraph 6.1.4.) codes each diagnosis into one or more of 47 categories, as listed in "The Royal College of Obstetricians and Gynaecologists Standard form for Maternity Medical Reports and Abridged Maternity Hospital Reports".
- 7.1.2. The Clerkess maintains a diagnostic index, which consists of 6" x 4" cards made out for each of the 47 categories.
- 7.1.3. She selects the card relevant to the patient's diagnosis and enters on it the:
- (a) Patient's name
 - (b) Husband's name
 - (c) Unit Number
 - (d) Admission and discharge date (from the ward).
- 7.1.4. After all the details have been entered on the diagnostic cards, the case records are returned to the Records Department and filed by the Ante-Natal Clinic clerkess as before.

7.2. Comments

Considering the sophisticated diagnostic index facilities available through the Group Records Department at Ruchill Hospital, we feel that the maintenance of this local index is unnecessary, and that it should be discontinued.

8. CLINIC RECEPTION

8.1. Present Procedure

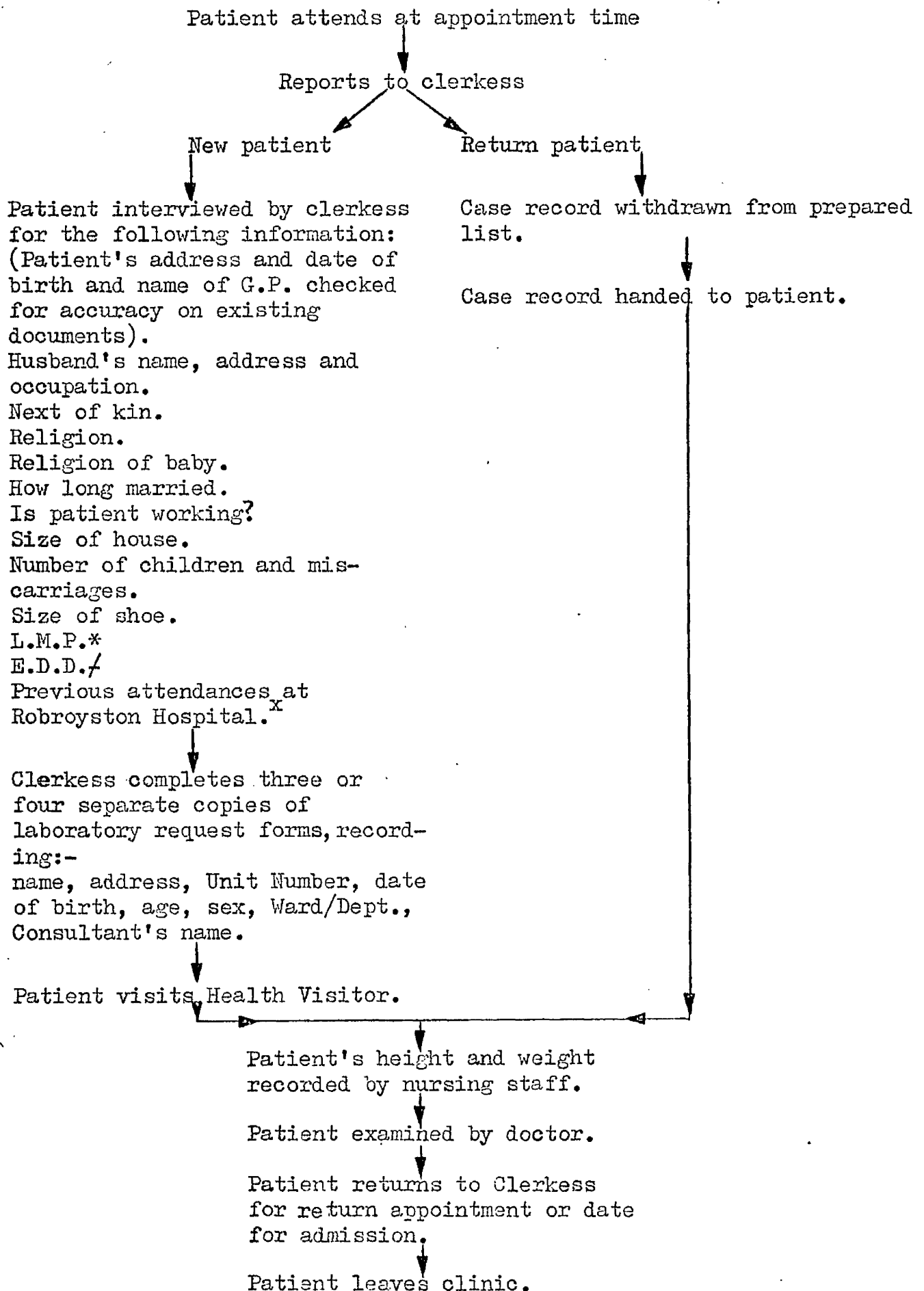
8.1.1. During clinic sessions, the clerkess's time is largely taken up by reception duties, viz:-

- (a) receiving patients
- (b) interviewing new patients
- (c) booking return appointments
- (d) tracing previous case records

8.1.2. The following table describes in detail the various stages of a patient's visits to the Clinic and the clerical procedures involved:-

Over/.....

3.1.2. (cont'd)



N.B. Footnotes overleaf.

8.2. Comments

8.2.1. Previous attendances at Robroyston Hospital

Questioning the patient about these instead of referring to the master index when the appointment request form is first received is a thoroughly unsatisfactory procedure. (See paragraph 3.2.2.)

8.2.2. Laboratory Request Forms

During the reception of the patient the clerkess records, by hand, the basic data separately on three or four request forms. This takes up much valuable time, and greatly slows the work flow of a busy clinic. (See paragraph 8.1.2.)

* Date of first day of last menstrual period.

/ Expected date of delivery.

x Unless stated in the appointment letter from the G.P., this interview with the patient is the only way that the clerkess will find out if the patient has previous hospital case notes. If this is so, the clerkess must leave the clinic unattended; go to the Records Department; check the master index for old Unit Number; draw the file; return to Clinic; match up old and new records and alter the new Unit Number on all new case documents.

9. OTHER CLERICAL DUTIES

9.1. The clerkess is responsible for the following procedures:-

After each clinic session, case records are returned from Consulting Rooms to clerkess.



They are checked against the appointment list and the attendances are recorded.



Total attendances are counted (new and return) and recorded for statistical return.



Records of new patients are laid aside and a labour room index card is completed, which records patient's name and address, E.D.D.*, gravida, and any notable medical features of patient or family (e.g. cardiac lesions or tuberculosis).



Information is transferred to a "booking book", in monthly order of E.D.D.*. This book shows the current number of patients booked for admission (for confinement) in any given month. Entries within each month are made in chronological order, each patient being allocated a number, which is recorded on the labour room index card.



Labour room index cards are sent to the labour room, and filed in alphabetical order. These cards can then be used for reference by the Ward Staff when a request for a patient's admission is made by a general practitioner or the Regional Board Hospital Admission Department.



When a patient is admitted, the relevant labour room index card is removed from file, the date of delivery is recorded on it, and the card is returned to the Ante-Natal Clinic clerkess.



On receipt of this card, the clerkess deletes the patient's name in the booking book.



She then destroys the labour room index card.

* Expected date of delivery.

- 9.2. The booking book is kept in the Ante-Natal Clinic. If a patient becomes apparently "overdue", she may, of course, have been delivered at home. The Health Visitor keeps a close eye on all entries in the booking book and investigates any apparently "overdue" patient.
- 9.3. After each clinic session, the clerkess is responsible for sending out new appointments to all "defaulters"* (new and return). If the patient fails to attend on more than two consecutive occasions, the clerkess then types a letter to the general practitioner for his information.
- 9.3.1. We understand that the Consultant-in-charge has newly discontinued the practice of sending a "defaulter" a fresh appointment as a matter of course. Instead a letter is being sent to her general practitioner to inform him that she has not attended, and that a fresh appointment will be made only if he specifically requests one.

* Patients who fail to attend ~~an~~ an appointment, without warning.

10. MEDICAL CORRESPONDENCE

10.1. Typing Survey

- 10.1.1. The following statistics were collected by a Secretary of the Medical Records Research Group, who typed all the medical correspondence for the Clinic for two weeks.
- 10.1.1.1. We intended that she would also assist the Clinic clerkess in her routine duties. Unfortunately, the latter became ill on the second day of the survey so we were unable to determine the ratio (in time requirements) between routine clerical duties and medical typing.
- 10.1.2. Letters were dictated during each clinic session by the Medical Staff using one portable tape-recorder, and transcribed by our Secretary using another.
- 10.1.3. The typed letters were presented for signature on the afternoon following a morning clinic, and vice versa.
- 10.1.4. The work load was as follows:-

DATE (April)	CLINIC	LETTERS	LINES/
Monday 3rd	Ante-and Post-Natal	14	74
Tuesday 4th	Ante-Natal	32	187
Wednesday 5th	Gynaecology	Nil*	Nil*
Thursday 6th	Ante-Natal	1 ^x	5

Monday 10th	Ante-and Post-Natal	16	68
Tuesday 11th	Ante-Natal	22	132
Wednesday 12th	Gynaecology	16	62
Thursday 13th	Ante-Natal	6	30
TOTALS		107	558

Average lines per letter = 5.2

/ Lines of text only, on quarto paper.

* Consultant on holiday.

x Clerical error: only one new patient sent for.

10.2. Comment

- 10.2.1. A typist permanently employed in the Clinic (in addition to the existing clerkess) would require her own typewriter, and should, we urge, be equipped also with at least two dictation machines.
- 10.2.1.1. Our figures suggest that two of these would be sufficient at present; two is a minimum, however, so that one can be used solely by the typist for transcription.
- 10.2.2. Our figures also suggest that a typist would not be fully occupied in medical typing. We feel, therefore, she could also usefully assist in routine clerical duties, particularly those concerned with mechanical documentation of patients attending the Clinic.
- 10.2.3. The present clerkess is a qualified typist. Employment of another typist/clerkess would ensure flexibility in the clerical services of the Clinic.

11. DISCUSSION

11.1. Present Staff

11.1.1. The present staff of one clerkess in the Ante-Natal Clinic is certainly insufficient to perform the necessary procedures in an efficient manner.

11.1.2. Without the great help provided at present by the Nursing Staff the situation might be much worse.

11.1.3. We feel, however, that, considering the many responsibilities placed upon her, the present clerkess carries out her duties surprisingly well.

11.2. Clinic Reception

11.2.1. The reception of patients, particularly new patients, at clinic sessions, occupies a large percentage of the clerkess's time and at these sessions she is, therefore, unable to perform many other tasks.

11.2.2. As can be seen from the list of clinic sessions (paragraph 2.1.1.) the only free time available to her is on Wednesday and Thursday mornings and all of Friday.

11.2.3. Much of the documentation of medical records and the making of new appointments must be done then, together with the filing of post-natal case records, laboratory reports, master index cards, etc.

11.3. Documentation of Medical Records.

11.3.1. Many of the clerical procedures are repetitive and time-consuming and could, we feel, be improved upon.

11.3.2. A notable fact which has emerged during this survey is that, during the documentation of each new patient, the clerkess types or writes the patient's basic data on the following number of separate occasions:

Name	14	times
Unit Number	8	"
Address	10	"
Age or Date of birth	7	"
G.P.'s name and address	5	"

11.3.3. In view of the fact that the Records Department already possesses mechanical documentation equipment, we strongly recommend that this equipment be used to provide a labelling service to the Ante-Natal Clinic.

11.3.3.1. This would necessitate the re-design of several of the standard forms but the saving in clerical time would more than compensate for this.

11.4. Recommended New Procedure for the Initial Documentation of Medical Records

1. Receive "Request for Appointment" forms.
2. Sort them into alphabetical order.
3. Check each letter against master index.
4. Draw previous records from file or issue new case folder.
5. Allocate Unit Number to new case folders.
6. Allocate appointment date and time.
 - (a) enter name and Unit Number only on appointment list.
 - (b) copy appointment date and time on "Request for Appointment" form.
7. Produce master plate for mechanical documentation.
8. Print sheets of labels.
9. Complete documentation of case record.
10. Send appointment card to patient.
11. File master index cards.

11.5. Filing

11.5.1. Laboratory Reports

We feel that if the Laboratories would record the Hospital Unit Number on their reports the filing of these reports would be made much easier. Assuming an increase in the clerical staff of the Ante-Natal Clinic, the responsibility for filing these reports should, we feel, be theirs.

11.5.2. Post-Natal Case Records

If the local diagnostic index is discontinued, there will be no need for post-natal case records to be returned to the Ante-Natal Clinic. We suggest, therefore, that, on completion of the discharge letters, all post-natal records be returned to the Records Department and filed by the Records Department Staff.

11.6. Additional Staff

11.6.1. We feel that the existing number of clerical staff in the Clinic is insufficient.

11.6.2. As the Consultant-in-charge wishes to have individual letters typed for every patient in future, we would recommend that at least one further typist be employed.

- 11.6.3. The present typing load is not excessive (see paragraph 10.1.4.) so part of her time could well be spent on other clerical duties.
- 11.6.4. Furthermore, if our various other recommendations are adopted, the present clerical load will be appreciably lessened.
- 11.6.5. It is possible, therefore, that a staff of two clerkess/typists would be sufficient for all requirements.

12. SUMMARY.

- 12.1. A detailed account is given of the present clerical procedures in the Ante-Natal Clinic of Robroyston Hospital.
- 12.2. The results are also given of a survey carried out to estimate the typing load resulting from an increase in out-patient correspondence.
- 12.3. Recommendations are made which would streamline the present clerical procedures of the Clinic.
- 12.4. The future clerical/typing staff requirements of the Clinic are discussed, with particular reference to the increasing typing load.

13. ACKNOWLEDGMENTS.

We wish to thank the medical, nursing and clerical staff of Robroyston Hospital for their kind co-operation during this enquiry.

The Unit Secretary.

A good Unit secretary has a difficult part to play. She has to work under varying degrees of pressure (as illustrated by the wave form earlier), and she has to plan her work in advance to allow for unexpected peak loads. Above all, however, she is a member of a medical or surgical team, and she is the guardian of the unit files in current use.

She is the one who remembers a patient's name when the particulars elude the clinicians and the file must be found in a hurry. She is the one who must remember to chase up a biopsy report so that the clinician can be presented at the soonest possible moment with report and unit file and arrange in time for the excision of a patient's rapidly growing carcinoma. She is the one who has to type at immediate notice a long report to accompany a patient transferred urgently elsewhere. She remembers for, organises for, and tidies up after the clinical staff. She is a personal secretary in the real sense of the word and there is little purpose in arguing that clinicians should do these things for themselves. One could similarly argue that everyone should grease his own car, paint his own house or wash his own clothes. The fact that he can does not necessarily mean that he should.

When patients (out- or in-) are having lengthy investigations done it is best to keep the case files in a pending tray (one per clinician) near the secretary, so that the fact that a patient's

management is incomplete is immediately apparent to any observer, and to show exactly what work is still outstanding. It is obviously tidier to immediately file the case notes back in the records department, but this will result in loose reports chasing round the hospital until the parent files are pulled and matched with them, or, worse still, such reports being neatly filed away in the case notes without ever having been scrutinised and acted upon by the clinician in charge of the patient. Four or five reports for any one patient may date back over a period of several days or weeks, and may have to be considered in toto before the diagnostic picture is clear. Such dangers are worse where a diagnosis of malignant disease is possible, and where rapid therapy is necessary once the diagnosis is reached.

I would, therefore, argue strongly in favour of personal secretaries in hospital Units (and by "personal" I mean personal to the Unit staff). Whether typing pools should be used to cope with peak loads is doubtful, and the transport and possible consequent disappearance of documents become growing problems. It may be that there are advantages in compromising, so that secretaries work in groups of at least two where possible, which allows for holiday and sickness cover, and the recent proposal to integrate hospital Units into larger specialist "divisions" (Scottish Home & Health Department, 1967) would immediately create such groups of secretaries.

A large department can have its own secretarial problems, however, as described in the next report. This shows above all that a secretary must type, file, transport, search for and collate the documents on which the whole organisation of her Unit depends. Here is a role which cannot be fragmented and centralised piecemeal in some remote "Centre" in the hospital.

If the secretary cannot cope with her work she may not need extra help but rather a change in her facilities and her work routine. In the particular situation described, many of the recommendations were adopted, with the result that the relocated secretaries no longer had a backlog of work and there ceased to be a serious problem of lost documents. Most significant of all, the number of secretaries did not have to be increased to effect the improvements, which confirmed the validity of the report's conclusions.

HOW MANY SECRETARIES?

An investigation in the Department of Medicine,
Western Infirmary, Glasgow.

M.R.R.G. REPORT NO. 21.

First published: June, 1967.

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1. INTRODUCTION

- 1.1. By February 1967 the secretaries in the Department of Medicine in the Western Infirmary had long since been unable to properly cope with their various tasks, and, in particular, letters to general practitioners were being grossly delayed.
- 1.2. The Hospital Secretary* was asked by the clinicians of the Department to employ extra secretaries. He, however, hesitated to agree to do so until he was sure that the existing secretaries were as well organised as they might be.
- 1.3. Accordingly, the Professor of Medicine asked the Medical Records Research Group to investigate the present situation, and to recommend any measures which would improve it; these measures might, of course, involve the employment of extra staff.

2. METHODS OF INVESTIGATION

- 2.1. The purpose and methods of the investigation were firstly explained personally to the secretaries and the clinicians in the Department.
- 2.1.1. They were asked to comment on any aspects of the present situation, and to voice any complaints they had, and what they thought should be done about these complaints.
- 2.2. A quantitative survey of each secretary's work was made for the next four weeks. Information was entered by the secretaries themselves on "bar-charts" with pre-determined work categories, which were fully defined (see paragraph 5.1.)
- 2.2.1. At the same time one extra carbon copy of all typed work was given to the Group so that this work could be classified and quantified.
- 2.3. At the start of the survey there was no secretarial work outstanding, this having been cleared by various extra (temporary) staff. These staff were then withdrawn for the period of the survey; work which had to be "off-loaded" during the survey was noted, and the "backlog" outstanding at the end of the four weeks was also noted.

(*i.e., the lay administrator or house governor).

3. GENERAL DESCRIPTION

3.1. Geography

For the purposes of this report, the Department of Medicine may be regarded as consisting of:-

3.1.1. Wards D.3 (female) and D.4 (male) on the first floor of the Infirmary : total beds = 44.

3.1.2. The Gardiner Institute of Medicine, which is a multi-storeyed building adjacent and connected to the above-mentioned wards. The Institute includes:-

3.1.2.1. A bed area of four 2-bedded rooms, one single room and one 5-bedded room : total beds = 14. These beds are geographically near both other wards, and may be thought of as comprising a third ward.

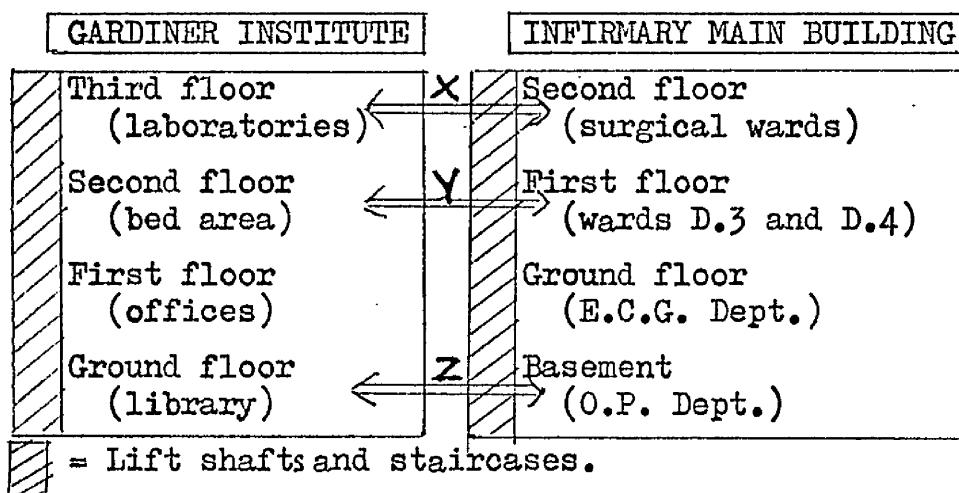
3.1.2.2. The Radio-Isotopes Department, which is scattered over several storeys.

3.1.2.3. Numerous offices for the clinical and secretarial staff. Most of these offices are on the floor below the Institute beds, and are correspondingly remote from Wards D.3 and D.4 (see paragraph 3.2.).

3.1.3. The E.C.G. Department, which consists of a suite of rooms on the ground floor of the Infirmary.

3.2. Intra-Departmental Communications

(schematic representation)



Of the link routes, only Y is an open corridor; X and Z are devious routes through various doors and rooms. It will be thus apparent that the offices in the G.I. are relatively isolated from Wards D.3 and 4, the connecting route being a corridor through the G.I. bed area, and a flight of stairs.

3.3. Clinical Staff

3.3.1. The organisation of the clinical staff in the Department has been described in detail in a previous paper*.

3.3.2. It is sufficient for present purposes to remind the reader that there are four physicians of Consultant status in the Department, who, in effect, organise work along separate specialist lines, and who are supported by numerous junior physicians, and by secretarial staff. The total number of Departmental physicians is 19.

3.3.3. The senior physicians are as follows:-

Sir Edward Wayne,
Regius Professor of Medicine.

Dr. A. J. V. Cameron,
N.H.S. Consultant Physician (whole-time) :
specialising in cardiology.

Dr. A. Goldberg,
Reader in Medicine : specialising in haematology.

Dr. W. D. Alexander,
Senior Lecturer in Medicine : specialising in
endocrinology.

3.4. Out-patient Clinics*

				Approx. No. of patients per Session
Day	Time	Clinic		
Monday	a.m.	General Medical		25
Monday	p.m.	General Medical		95
Monday	p.m.	Renal Malabsorption	alternately each week	10
Tuesday	p.m.	Haematology		35
Wednesday	a.m.	Anticoagulant		-
Wednesday	a.m.	Cardiac		40
Thursday	a.m.	Endocrine		45
Friday	a.m.	Bone		25
Friday	p.m.	Thyroid		40

All clinic sessions are held in the Out-patient Department, which is in the basement of the Infirmary.

3.5. Telephone System

There are two systems in the Infirmary which are not inter-connected: an internal system is operated by dial, and an external system via the switchboard. It is impossible to reach an external line from a dialling instrument.

*"Survey of Professor Wayne's Unit" : our Paper issued
in April 1966.

4. THE PRESENT SECRETARIES

4.1. Employed by the N.H.S.

4.1.1. Mrs. Sutherland and Miss Muir

They share a small office adjacent to Ward D.3, which has a minimum of working space, cupboards and shelves. Mrs. Sutherland is nearer the door and has an external telephone; Miss Muir has no telephone. They are responsible for all in-patient records in the Department, and for the general medical out-patient clinics, Mrs. Sutherland dealing mainly with Dr. Goldberg's work and Miss Muir with that of Dr. Alexander.

4.1.2. Mrs. Gegg

She works in a room in the E.C.G. Department, mainly because no other accommodation exists for her. Her furniture and space are less limited than those of her colleagues, but she has no telephone, and she must, therefore, use the instrument in the main area of the E.C.G. Department. She is responsible for all secretarial work connected with Dr. Cameron's cardiological service.

4.1.3. Mrs. Thomas

She shares a small office on the first floor of the Gardiner Institute, with Miss Davidson (see paragraph 4.1.4.) and Mrs. Heron (see paragraph 4.2.1.). Space is extremely limited, and office furniture minimal. There is one external telephone in the room, with one extension to Dr. Alexander's office and one to Dr. Harden's* office. She is responsible for all out-patient clinics except the general medical ones.

4.1.4. Miss Davidson

She works in the same office as Mrs. Thomas (see paragraph 4.1.3.) and Mrs. Heron (see paragraph 4.2.1.), and is employed by^a grant for "Higher Medicine" from the Regional Board. She is responsible to Dr. Alexander and does data processing in connection with his research work in endocrinology. Consequently she types some of the letters about patients who attend the Radio-isotopes Department.

4.2. Employed by the Glasgow University

None of these secretaries is responsible for routine clinical records.

4.2.1. Mrs. Heron

She shares an office with Mrs. Thomas (see paragraph 4.1.3.) and Miss Davidson (see paragraph 4.1.4.), and is personal secretary to Dr. Alexander. She helps with the secretarial work of the Radio-isotopes Department.

*Dr. R.M. Harden, Lecturer in Medicine, specialising in endocrinology.

4.2.2. Miss Stewart

She shares an office on the first floor of the Gardiner Institute with Mrs. Henaghan (see paragraph 4.2.3.), which has an external telephone with an extension to Dr. Goldberg's office. She acts as personal secretary to Dr. Goldberg.

4.2.3. Mrs. Henaghan

She is employed as part-time personal secretary to Dr. D.A.S. Smith (Lecturer in Medicine, specializing in calcium metabolism) and shares an office with Miss Stewart (see paragraph 4.2.2.).

4.2.4. In addition, offices on the ground floor of the Gardiner Institute house a Librarian, who also types some papers for publication, and Professor Wayne's personal secretary, but we considered these people's work to be irrelevant to our survey.

4.3. RECORDING MACHINES

Location	Used by	For
Ward D.3	House Physicians and Registrars	Dictation
Ward D.4	Cardiology Registrars *	Dictation
Ward D.3	Dr. Cameron /	Dictation
Ward D.3	Mrs. Sutherland	Transcription
Ward D.3	Miss Muir.	Transcription
E.C.G. Dept.	Mrs. Gegg	Transcription
G.I./Clinics /	Clinicians/ Mrs. Thomas	Dictation/ Transcription
G.I.	Clinicians	Dictation
G.I.	Dr. Goldberg/ Miss Stewart	Dictation/ Transcription
G.I.	Dr. Alexander/ Mrs. Heron	Dictation/ Transcription

* for their use only.

/ his personal property.

G.I. = Gardiner Institute.

/ a portable machine.

4.3.1. In the Gardiner Institute more than one machine may be required at one time for the dictation of out-patient clinic letters. The University machines of Dr. Goldberg and Dr. Alexander are freely borrowed for this purpose if they are not already in use.

5. RESULTS

5.1. Definition of terms

Each secretary was given printed instructions to help her classify her work on the bar-chart. The terms of classification used subsequently in this report will now be discussed.

5.1.1. Telephone enquiries

All telephone calls in or out, specified, in addition, as "Hospital" or "University" business. The former was defined as concerned with normal routine patient care, the latter as to do with research or educational matters; in other words, the N.H.S. secretaries are responsible for the former, the University secretaries for the latter. The fact that both types of secretary dealt with both types of telephone call is an indication of the tangle of lines of communication in the Department, which is at least partly due to the sharing of telephones.

5.1.2. Tracing case records

Looking for case records for any reason other than the preparation of clinics and the filing of laboratory reports; for example, searching for a record in the Department following a request for it from another department or clinic. Such a request may come from the Records Department whose tracer card for that case record indicates the record is presently in the Department of Medicine.

5.1.3. Clinic preparation

Preparing documents and tracing records for clinics, in collaboration with the Records Department, which is normally primarily responsible. However, it must be noted that Dr. Alexander has latterly been dissatisfied with the Records Department's handling of this work, and has deemed it preferable that, in the case of the Endocrine and Thyroid Clinics, appointments, and the follow-up of patients failing to keep appointments (so-called "defaulters") should be organised primarily by Departmental secretaries.

5.1.4. Clinic attendance

This is at the discretion of the clinician in charge of each clinic, the secretary attending primarily in a clerical capacity rather than as a receptionist in the broader sense.

5.1.5. Filing (general)

The filing of general items of correspondence, case records, etc., in local files.

5.1.6. Filing lab. reports

The filing of laboratory reports, E.C.Gs., X-Rays, etc., into case records, including searching for these case records.

5.1.7. Despatch of lab. reports (G.I.)

The research laboratories of the Gardiner Institute, with which we may include the radio-isotopes laboratory, issue reports for delivery to other departments and other hospitals. The secretarial staff put these reports into envelopes, address the envelopes and add them to other outgoing external/internal mail.

5.1.8. Messenger duties

Fetching or delivering any item to any other part of the Infirmary, including the transport of case records, X-Rays, etc., between Wards D.3 and D.4 and the Gardiner Institute. Finding an item was not included in this category.

5.1.9. Tea and lunch breaks

The reader should note that University secretaries are entitled to more off-time for meals than their N.H.S. colleagues.

5.1.10. Unoccupied time

When the secretary was not working. This item was not included as an index of the recorder's honesty.

5.1.11. Miscellaneous duties

Any item of work not included in the above list, with the exception of typing; for example, interruptions by other members of staff (medical, nursing or secretarial) for general information. It should be noted that the University secretaries' and Miss Davidson's figures for this item are partly due to their work being more often not classifiable under the other headings.

5.1.12. Typing time was calculated by us as the total working time of the secretary minus the total of bar-chart items. We feel that this is an acceptably accurate method of calculation, especially because typing work, being frequently interrupted, consisted of many small portions, and repeated rounding up of the figures (see footnote to bar-chart, paragraph 5.2.) would make for an inaccurate total.

5.1.13. Typed lines were measured as quarto lines of finally corrected text. Letter headings, salutations, etc., envelope texts, and re-typed items were not included.

5.2. Specimen bar-chart

Shown overleaf.

Date

[illegible]

Notes: Horizontal lines should be drawn as work is done to show how time has been spent.

No lines of less than 5 minutes should be entered.
IGNORE LESS THAN 2½ MINUTES - OVER 2½ MINUTES
ROUND UP TO 5 MINUTES.

Attach copies of daily correspondence.

	P.M.	1	2	3
1. Telephone Inquiries (Hospital)				
2. Telephone Inquiries (University)				
3. Training Case Records				
4. Clinic Preparation				
5. Clinic Attendance				
6. Filing (General)				
7. Filing (Lab. Reports)				
8. Despatch of Lab. Reports (G.I.)				
9. Shorthand Dictation				
10. Messenger Duties				
11. Tea & Lunch Breaks				
12. Unoccupied Time				
13. Miscellaneous Duties				

- 5.3. Mrs. Sutherland and Miss Muir
See overleaf.

5.3.1.

Secretary Mrs. Sutherland. Hours of Duty 8.30 - 5.00

TOTALS AND PERCENTAGES

ITEM	Week 1.		Week 2.		Week 3.		Week 4.		Totals	
	Total (mins.)	%	Total (mins.)	%	Total (mins.)	%	Total (mins.)	%	(for 4 weeks) Totals	%
1. Telephone Enquiries (Hosp.)	105	4.1	80	3.1	70	2.8	105	4.1	360	3.5
2. Telephone Enquiries (Univ.)	-	-	5	0.2	10	0.4	-	-	15	0.1
3. Tracing Case Records	115	4.5	85	3.3	35	1.3	-	-	235	2.3
4. Clinic Preparation	65	2.6	75	2.9	65	2.6	75	2.9	280	2.7
5. Clinic Attendance	210	8.2	210	8.3	200	7.8	195	7.7	815	8.0
6. Filing (General)	-	-	-	-	-	-	25	1.0	25	0.2
7. Filing Lab. Reports	150	5.9	105	4.1	145	5.7	65	2.6	465	4.6
8. Despatch of Lab. Reports G.I.	5	0.2	-	-	-	-	-	-	5	0.1
9. Shorthand Dictation	100	3.9	-	-	15	0.6	45	1.8	160	1.6
10. Messenger Duties	20	0.8	70	2.8	110	4.3	80	3.1	280	2.7
11. Tea and Lunch Breaks	345	13.5	370	14.5	375	14.7	355	13.9	1445	14.2
12. Unoccupied Time	50	2.0	-	-	-	-	-	-	50	0.5
13. Miscellaneous Duties	395	15.5	245	9.6	390	15.3	220	8.6	1250	12.3
Weekly Totals	1560	61.2	1245	48.8	1415	55.5	1165	45.7	5385	52.8
Typing Time	990	38.8	1305	51.2	1135	44.5	1385	54.3	4815	47.2
Letters/Lines	46/691		50/1107		41/382		48/647		185/2827	
Papers/Lines	-		-		-		-		-	
Tables/Lines	-		-		-		-		-	
Stencils/Lines	-		-		-		-		-	

5.3.2.

Secretary ... Miss. Muir..... Hours of Duty .8,30.-.5,00

TOTALS AND PERCENTAGES

ITEM	Week 1.		Week 2.		Week 3.		Week 4.		Totals	
	Total (mins.)	%	Total (mins.)	%	Total (mins.)	%	Total (mins.)	%	(for 4 weeks)	Totals
1. Telephone Enquiries (Hosp.)	30	1.2	5	0.2	-	-	15	0.6	50	0.
2. Telephone Enquiries (Univ.)	-	-	-	-	20	0.8	10	0.4	30	0.
3. Tracing Case Records	105	4.1	75	2.9	15	0.6	10	0.4	205	2.
4. Clinic Preparation	140	5.5	185	7.3	140	5.5	85	3.3	550	5.
5. Clinic Attendance	210	8.3	220	8.6	190	7.5	200	7.8	820	8.
6. Filing (General)	85	3.3	25	1.0	190	7.5	40	1.6	340	3.
7. Filing Lab. Reports	120	4.7	145	5.7	105	4.1	90	3.5	460	4.
8. Despatch of Lab. Reports G.I.	-	-	-	-	-	-	-	-	-	-
9. Shorthand Dictation	15	0.6	35	1.4	-	-	45	1.8	95	0.
10. Messenger Duties	55	2.1	80	3.1	65	2.5	70	2.7	270	2.
11. Tea and Lunch Breaks	380	14.9	410	16.1	385	15.1	400	15.7	1575	15.
12. Unoccupied Time	-	-	-	-	-	-	-	-	-	-
13. Miscellaneous Duties	285	11.2	155	6.1	235	9.1	10	0.4	685	6.
Weekly Totals	1425	55.9	1335	52.4	1345	52.7	975	38.2	5080	49.
Typing Time	1125	44.1	1215	47.6	1205	47.3	1575	61.8	5120	50.
Letters/Lines	55/832		44/694		54/849		80/1121		233/3496	
Papers/Lines	-		-		1/12		-		1/12	
Tables/Lines	-		-		1/8		-		1/8	
Stencils/Lines	-		1/19		-		-		1/19	

5.3.3. Comment

5.3.3.1. Mrs. Sutherland and Miss Muir share a telephone which is located beside the former.

5.3.3.2. They collect loose laboratory reports and E.C.Gs., and case records, all of discharged patients, from the House Physician's office*, and complete diagnostic cards from information in the case records. (Diagnostic cards are used by the Records Department staff to complete morbidity returns for the Home and Health Department, and to compile the Infirmary diagnostic and operations indexes). The actual diagnosis is often not specified in a case record, in which case one of the medical staff must be approached for further information. They also note, in a book, details of all patients discharged home, transferred to other hospitals, etc. When a patient is transferred to Knightswood Hospital his case record goes with him, so all trace of the patient may be lost except for a diagnostic card. Effort must then be made by the secretaries to (a) ascertain where the patient has gone and (b) find someone who can remember the necessary information for the diagnostic card. This may involve a walk to the far end of the Gardiner Institute bed area to interview the nursing staff.

5.3.3.3. All X-Rays for in- and out-patients in the Department of Medicine are first delivered to Mrs. Sutherland and Miss Muir. They sort these X-Rays, take the ones for in-patients to the House Physician's office*, match the ones for relevant out-patients with the appropriate case-sheets, and deliver the remainder (those of out-patients in other clinics) to Mrs. Thomas and Mrs. Gegg. When the X-Ray Department 'phones for a film, the secretary personally delivers it to them.

5.3.3.4. All out-patient laboratory reports (including E.C.Gs.) are delivered to Mrs. Sutherland and Miss Muir. The ones for clinics for which they are not responsible they personally deliver to Mrs. Thomas and Mrs. Gegg.

* on the ward corridor nearby.

5.4.

Secretary ... Mrs Gegg Hours of Duty ..8.30...5.00

TOTALS AND PERCENTAGES

ITEM	Week 1.		Week 2.		Week 3.		Week 4.		Totals	
	Total	%	Total	%	Total	%	Total	%	(for 4 weeks)	%
	(mins.)		(mins.)		(mins.)		(mins.)		Totals	%
1. Telephone Enquiries (Hosp.)	160	7.8	65	4.2	195	7.6	105	4.1	525	6.1
2. Telephone Enquiries (Univ.)	40	1.9	-	-	20	0.8	10	0.4	70	0.8
3. Tracing Case Records	50	2.5	35	2.3	10	0.4	-	-	95	1.1
4. Clinic Preparation	115	5.6	45	2.9	60	2.4	75	2.9	295	3.4
5. Clinic Attendance	35	1.7	-	-	10	0.4	25	1.0	70	0.8
6. Filing (General)	50	2.5	25	1.6	25	1.0	-	-	100	1.1
7. Filing Lab. Reports	10	0.5	20	1.3	70	2.7	55	2.1	155	1.8
8. Despatch of Lab. Reports G.I.	-	-	-	-	-	-	-	-	-	-
9. Shorthand Dictation	30	1.5	15	1.0	55	2.2	60	2.4	160	1.8
10. Messenger Duties	120	5.9	70	4.6	110	4.3	40	1.6	340	3.9
11. Tea and Lunch Breaks	285	14.0	165	10.8	350	13.7	280	11.0	1080	12.5
12. Unoccupied Time	-	-	-	-	-	-	-	-	-	-
13. Miscellaneous Duties	115	5.6	90	5.9	35	1.4	150	5.9	390	4.5
Weekly Totals	1010*	49.5	530 /	34.6	940	36.9	800	31.4	3280	37.8
Typing Time	1030	50.5	1000	65.4	1610	63.1	1750	68.6	5390	62.2
Letters/Lines	44/490		61/734		55/905		94/1018		254/3147	
Papers/Lines	-		-		-		-		-	
Tables/Lines	4/61		9/95		5/39		-		18/195	
Stencils/Lines	3/58		-		-		-		3/58	

* = 4 day week (1 day sick)

/ = 3 day week (1 day sick, 1 day holiday)

5.4.1. Comment

Mrs. Gegg is handicapped by her geographical isolation and by having no personal telephone.

5.5.

Secretary ..Mrs. Thomas..... Hours of Duty ..8.30.-.5.00

TOTALS AND PERCENTAGES

ITEM	Week 1.		Week 2.		Week 3.		Week 4.		Totals	
	Total	%	Total	%	Total	%	Total	%	(For 4 weeks)	%
	(mins.)		(mins.)		(mins.)		(mins.)		Totals	%
1. Telephone Enquiries (Hosp.)	65	2.5	60	2.4	95	3.7	75	3.3	295	3.0
2. Telephone Enquiries (Univ.)	-	-	-	-	-	-	5	0.2	5.	0.1
3. Tracing Case Records	135	5.3	195	7.7	380	14.9	80	3.5	790	7.9
4. Clinic Preparation	70	2.7	265	10.4	230	9.0	295	12.8	860	8.6
5. Clinic Attendance	260	10.2	240	9.4	295	11.6	145	6.3	940	9.4
6. Filing (General)	55	2.2	10	0.4	15	0.6	30	1.3	110	1.1
7. Filing Lab. Reports	120	4.7	235	9.2	145	5.7	175	7.6	675	6.8
8. Despatch of Lab. Reports G.I.	80	3.1	50	2.0	85	3.3	65	2.8	280	2.8
9. Shorthand Dictation	70	2.7	70	2.7	105	4.1	40	1.7	285	2.9
10. Messenger Duties	185	7.3	170	6.7	185	7.3	105	4.5	645	6.5
11. Tea and Lunch Breaks	435	17.1	325	12.7	370	14.5	340	14.7	1470	14.8
12. Unoccupied Time	30	1.2	-	-	20	0.8	45	1.9	95	0.9
13. Miscellaneous Duties	420	16.5	580	22.7	515	20.2	670	29.0	2185	21.9
Weekly Totals	1925	75.5	2200	86.3	2440	95.7	2070	89.6	8635	86.
Typing Time	625	24.5	350	13.7	110	4.3	240	10.4	1325	13.
Letters/Lines	28/199		92/576* 16/97		28/205* 12/79		103/795* 10/123		223/1576* 66/498	
Papers/Lines	-	-	-	-	-	-	-	-	-	-
Tables/Lines	-	-	-	-	-	-	-	-	-	-
Stencils/Lines	-	-	-	-	-	-	-	-	-	-

* = Work done by Typing Pool

5.5.1. Typing load

5.5.1.1. Mrs. Thomas, during the survey, personally typed 66 letters (totalling 498 lines). At the same time, another 223 letters (1,576 lines) were typed for her by the Infirmary typing pool. The total of these two figures, i.e. 289 letters (2,074 lines) indicates an average letter as being of 7.2 lines.

5.5.1.2. At the end of the survey, 74 letters remained outstanding, and, as there was no backlog at the start of the survey, we must regard these 74 letters as backlog after four weeks. Assuming these letters also to average 7.2 lines each, they would total 533 lines.

5.5.1.3. This means that Mrs. Thomas's true typing load, had she been able to cope, would, in four weeks, have been 363 letters, totalling about 2607 lines.

5.5.1.4. Mrs. Thomas types notes of the Scan Meeting (a Radio-isotopes-Radiotherapy joint procedure) held every fortnight. Each Meeting involves the marshalling of documents of some six patients, and Mrs. Thomas is responsible for this also.

5.5.2. Comment

5.5.2.1. Mrs. Thomas is seriously handicapped by having to share with two other secretaries a very small, poorly furnished office, which is equipped with only one telephone.

5.5.2.2. Furthermore, the pending letters are delayed through the lack of recording machines. A clinician may have to wait until a machine is free before he can dictate his letters, and by that time he is probably involved with something else.

5.5.2.3. This delay, in turn, leads to a vicious circle, where case records with letters still pending are required elsewhere. Individual records become difficult to trace, the letters are still further delayed, and, in the end, may be completely overlooked, at least until the patient returns for another appointment. Elaborate precautions have to be taken to ensure that clinic "defaulters" (see paragraph 5.1.3.) are not lost trace of in this document confusion.

5.5.2.4. All this is aggravated by having to off-load work to the Infirmary typing pool. Case records and letters are further delayed, case records are even more difficult to trace, and laboratory results arriving in the Department in the meantime lie unmatched with the relevant case records.

5.6.1. Comment

5.6.1.1. Miss Davidson's work cannot be regarded in the same light as that of the secretaries so far considered. She is involved in special data processing, particularly in connection with the Thyroid and Endocrine Clinics, and with the Radio-isotopes Department, to which many of these patients are referred. Inevitably, she becomes involved in some of the routine secretarial tasks concerned with these aspects of the Department of Medicine. To some extent, this is convenient for all concerned, especially as the Radio-isotopes Department has no secretary, but, on the other hand, her involvement is a measure of the need for such an additional secretary, and of the inability of Mrs. Thomas to cope fully.

5.6.2.2. Miss Davidson is handicapped by her lack of office space and equipment, and by her not having a personal telephone.

5.7.

Secretary ... Mrs. Heron.... Hours of Duty ..9.00.-.5.00.

TOTALS AND PERCENTAGES

[illegible]

5.7.1. Comment

5.7.1.1. Mrs. Heron is handicapped by her cramped office facilities, and by having to share a telephone.

5.7.1.2. Her involvement with some of the secretarial work of the Radio-isotopes Department is an indication of the need for organised secretarial cover for this Department.

5.7.1.3. Her main duties as personal secretary to Dr. Alexander involve typing letters, and typing medical papers; requesting, filing and indexing reprints of published papers; typing student notices, time-tables, examination papers, etc., and making copies of such documents on a spirit duplicator.

5.8.

Secretary Miss Stewart.... Hours of Duty ...9.30.-5.30.

TOTALS AND PERCENTAGES

ITEM	Week 1.		Week 2.		Week 3.		Week 4.		Totals	
	Total (mins.)	%	Total (mins.)	%	Total (mins.)	%	Total (mins.)	%	(For 4 weeks) Totals	%
1. Telephone Enquiries (Hosp.)	25	1.1	25	1.1	30	1.3	35	1.5	115	1.2
2. Telephone Enquiries (Univ.)	30	1.3	5	0.2	60	2.5	40	1.7	135	1.4
3. Tracing Case Records	55	2.3	60	2.5	55	2.3	45	1.9	215	2.2
4. Clinic Preparation	70	2.9	70	2.9	60	2.5	110	4.6	310	3.2
5. Clinic Attendance	-	-	-	-	-	-	-	-	-	-
6. Filing (General)	5	0.2	45	1.9	110	4.6	-	-	160	1.7
7. Filing Lab. Reports	10	0.4	20	0.8	10	0.4	-	-	40	0.4
8. Despatch of Lab. Reports G.I.	-	-	-	-	-	-	-	-	-	-
9. Shorthand Dictation	155	6.5	105	4.4	110	4.6	75	3.1	445	4.6
10. Messenger Duties	75	3.1	40	1.7	50	2.1	70	2.9	235	2.5
11. Tea and Lunch Breaks	605	25.2	585	24.3	570	23.7	625	26.0	2385	24.9
12. Unoccupied Time	70	2.9	45	1.9	135	5.6	190	7.9	440	4.6
13. Miscellaneous Duties	735	30.6	585	24.3	435	18.1	290	12.1	2045	21.3
Weekly Totals	1835	76.5	1585	66.0	1625	67.7	1480	61.7	6525	68.0
Typing Time	565	23.5	815	34.0	775	32.3	920	38.3	3075	32.0
Letters/Lines	34/276		21/192		42/308		16/128		113/904	
Papers/Lines	4/232		3/443		2/363		4/720		13/1758	
Tables/Lines	4/62		12/255		15/190		1/2		32/509	
Stencils/Lines	-		1/120		-		1/22		2/142	

5.8.1. Comment

Miss Stewart is seen from these figures to be involved to some extent in work connected with clinics, which is an indication of the inability of the N.H.S. secretarial team to cope with their work.

5.9. Mrs. Henaghan

Unfortunately, during part of the period of the survey, Mrs. Henaghan's working routine was seriously upset by personal circumstances, and her daily figures were so obviously non-representative that we decided not to record any of them in this report. However, we should stress that she off-loaded no work, so her colleagues' figures were not distorted as a result.

[illegible]

5. 10. 2.

SECRETARY	% of working day spent on clerical duties	% of working day spent on typing duties	% of working day spent on tea and lunch breaks	TOTAL
SUTH.	38.6	47.2	14.2	100%
MUIR	34.4	50.2	15.4	100%
GEGG	25.3	62.2	12.5	100%
THOM.	71.9	13.3	14.8	100%
DAV.	71.5	7.4	21.1	100%
HER.	38.0	37.0	25.0	100%
STEW.	43.1	32.0	24.9	100%

5.10.3. Comment

- 5.10.3.1. The involvement of Miss Stewart in clinical work has already been commented on (paragraph 5.8.1.).
- 5.10.3.2. Miss Davidson's work is largely connected with research so we should not concern ourselves overmuch with her figures.
- 5.10.3.3. Mrs. Gegg's high telephone figures reflect her having to leave her office each time she uses the telephone.
- 5.10.3.4. Mrs. Thomas's figures are particularly significant. The high figure for tracing case records is an index of the chaotic state of the documents for which she is responsible. The high telephone and messenger duties reflect the geographical location of her office, and the fact she has no personal telephone. The high shorthand figure for her own low letter output reflects the lack of recording instruments in the Gardiner Institute. Finally, the high figure for miscellaneous duties probably reflects her high interruption rate, which cannot but have a further adverse effect on her work output.
- 5.10.3.5. One might question, in view of all this, why Mrs. Thomas is made responsible for the despatch of the laboratory reports of the Gardiner Institute.

6. DISCUSSION

6.1. The outstanding problem

- 6.1.1. If such is not already clear, the following figures should convince the reader that the outstanding problem in the secretarial services in the Department of Medicine is the lack of time Mrs. Thomas has to type out-patient clinic letters:-

Secretary	Percentage of working time spent typing	Projected line output * per four weeks
Dr. Richards' Unit [✓]	46	4,280
Mr. Clark's Unit [✓]	32	2,752
Mrs. Sutherland	47.2	2,827
Miss Muir	50.2	3,496
Mrs. Gegg	62.2	3,147
Mrs. Thomas	13.3	498

* Measured as before : see paragraph 5.1.13.

[✓] See our Paper "Survey of Dr. Richards' Unit", March 1966.

[✓] See our Paper "Survey of Mr. Clark's Unit", June 1966.

- 6.1.2. These figures can only be interpreted loosely because the methods of calculating the length of working day varies somewhat in respect of the other Units, and the working conditions and typing material vary enormously. The similarities of the figures of all the secretaries except Mrs. Thomas are, however, striking.

- 6.1.3. Mrs. Thomas has the highest load of patient/document organisation and a high commitment of typing line output (see paragraph 5.5.1.3.), yet she has the poorest office facilities of all the Departmental secretaries, and these facilities are in a place which is relatively remote from those of two out of three of her colleagues, with whom she needs to consult frequently.

- 6.1.4. In these circumstances, particularly, we question whether Mrs. Thomas should be responsible for either the document preparation and processing concerning the Scan Meetings, or for the despatch of the Gardiner Institute laboratory reports.

6.2. Reorganising the present secretaries

- 6.2.1. What, above all, is necessary in the rationalisation of the secretarial work in the Department of Medicine is the reduction of time spent by the secretaries in (a) communicating with each other and (b) communicating with other departments, particularly the Records Department.
- 6.2.2. We realise that the secretarial services in the Department of Medicine have evolved slowly over many years and that the majority of the out-patient clinics began as research ventures, which were sponsored originally from University funds, and were supported by the University-salaried secretaries. Today, however, these clinics should be regarded as routine clinics of the Infirmary, and the secretarial support for them should be a direct responsibility of the Board of Management.*
- 6.2.3. Accordingly, we suggest that, as a first step, Mrs. Sutherland, Miss Muir and Mrs. Thomas should be located together, either in one large room, or in adjoining rooms equipped with intercom. apparatus.
- 6.2.4. Whether Mrs. Gegg should be integrated in a similar fashion is less certain, partly because the cardiological services of the Infirmary are tending to become more and more separate from the Department of Medicine, and partly because we doubt if, within the vicinity of Wards D.3 and D.4, there is a sufficiently large room to adequately house four secretaries.
- 6.2.5. There is no use substituting one cramped office for another. Each secretary should be afforded ample desk and table-top surface, a personal telephone, a personal recording transcriber, and ample filing shelves.
- 6.2.6. The very fact that the secretaries were together would mean that pending documents were, to a great extent, centrally located, and this would save much valuable time, at present spent walking from place to place to deliver, fetch and search for such documents.
- 6.2.7. Even this would not be enough, however. Attention would have to be paid to environmental factors such as illumination, ambient temperature, and, above all, background noise. The latter could only be minimised by the provision of non-metallic furniture, sound-absorbent mountings for typewriters, suitable wall-to-wall carpeting, heavy window drapes, and sound-absorbent ceiling tiles.

* We have already commented on this matter in paragraph 13.4. of our Paper "Survey of Professor Wayne's Unit" issued in April, 1966, to which the reader is referred.

6.2.7. Such items of furnishing are too often regarded in the N.H.S.
(cont'd) as extravagant nonsense, but their value in commercial settings is well known.*

6.3. Extra staff

6.3.1. It would be unwise to try to project our detailed figures to such a revised situation to calculate how much, if any, extra secretarial help would then be required to cope with present requirements. We suspect that, ignoring the needs of the Radio-isotopes Department, perhaps no extra staff would be required. This would depend, of course, on an integrated team of secretaries, maintaining separate commitments as a first priority, yet able and willing to help one another in times of high work load and absences due to sickness and holidays.

6.3.2. We feel that the practice of off-loading work to the Infirmary typing pool should cease.

6.3.3. We also feel that, whilst secretarial staff of some kind must participate in the work of the Radio-isotopes Department, Mrs. Sutherland, Miss Muir, Mrs. Gegg or Mrs. Thomas should not do so, and we shall not, therefore, discuss this matter further at present, although we shall be considering the document organisation of the Radio-isotopes Department at a later date, and shall comment then on the provision of secretarial facilities.

6.3.4. Assuming, then, that centralising the three (or perhaps four) present N.H.S. secretaries in the ward area still does not result in the work load being fully met, what type of extra staff should be recruited? Should it be another secretary or a non-typing clerk?

6.4. Secretary versus clerk

A clerk might be thought to be a more economic proposition from the employer's point of view, but we feel that a fully-trained secretary would be preferable for the following reasons:-

6.4.1. Holiday and sickness cover for all the secretaries would be easier to provide.

6.4.2. A clerk working with three (or four) secretaries would, almost certainly, lead to demarcation disputes because of the status differential. If the clerk could not cope, a secretary would not be over-willing to help her; more probably a backlog of work would result.

* See "Centralised Dictation Services : personnel aspects" : Institute of Personnel Management, London, 1966, and "Medical Records and Secretarial Services" : Hospital O. & M. Service Reports No. 2, H.M.S.O., 1959.

6.4.3. A secretary doing typing and clerking tasks with the same batch of documents knows exactly what is necessary and can deal more quickly with problems and enquiries. A clerk, having half a task passed to her, might require lengthy explanations. The adage "If you want a thing done properly you do it yourself" would apply in many instances, and the rate of work throughput might slow down rather than speed up with a clerk being involved.

6.5. Wider changes

On a wider basis, we feel that this survey has shown, again, how the organisation of the Infirmary as a whole could be improved.

6.5.1. Messenger service

Much of a secretary's time is spent fetching and delivering items from and to distant points in the building. A properly organised internal messenger service would be very valuable.*

6.5.2. Records Department

When a unit secretary wishes to obtain a case record from the files in the Records Department, she must go and find and remove it herself, and complete the necessary tracer card, which is left in the appropriate shelf location. We doubt if this "do-it-yourself" system is economical in terms of secretary-time, and suggest that a small addition to the Records Department clerical staff would be preferable, so that requests could, as much as possible, be managed on a telephone plus over-the-counter basis. This would, of course, be necessary were a messenger service to be introduced.

6.5.3. Clinic receptionists

Where special clerks might be usefully employed would be in the Out-Patient Department, being responsible for taking over case records before clinic sessions, matching them with patients as they arrived, inserting laboratory reports, etc., as they came to hand, and forwarding the documents at the end of each clinic session to the unit secretary or to a member of the medical/surgical staff attending the clinic. We suggest that each receptionist should be responsible to and liaise with the relevant unit secretaries, and she could, if necessary, help with patient "reception" in the broader sense. We draw the reader's attention to the system operating in Glasgow Royal Infirmary.

* See our Paper "A Hospital Messenger Service" issued in July 1966.

7. RECOMMENDATIONS

- 7.1. Mrs. Sutherland, Miss Muir and Mrs. Thomas should be moved to a single large office in the vicinity of Wards D.3 and D.4. This would necessitate rearranging the present functions of the rooms in that area.
- 7.1.1. Mrs. Gegg might usefully be transferred there also, subject to the room being sufficiently large.
- 7.2. Each secretary should be provided with:-
- (a) a desk at least 4'6" x 2'6" with ample drawer space.
 - (b) a swivel typist's chair.
 - (c) ample and readily accessible open wall shelving.
 - (d) sufficient filing cabinet storage.
 - (e) a personal telephone.*
 - (f) a personal recording transcriber.
- 7.3. The room should be well illuminated, well heated, well ventilated, and have adequate sound absorption (see paragraph 6.2.7.).
- 7.4. Mrs. Thomas should not be responsible for documents in connection with Scan Meetings, or for despatch of Gardiner Institute laboratory reports.
- 7.5. None of the above-mentioned four secretaries should be responsible for documents of the Radio-isotopes Department.+
- 7.6. The three (or four) secretaries in the one room should continue to work primarily according to their present responsibilities, but should, nevertheless, co-operate in times of peak work-load and absences due to sickness and holidays. This arrangement might make the appointment of one of them as titular supervisor advisable.
- 7.6.1. More recording machines should be provided for dictation by the medical staff.
- 7.6.2. Mrs. Sutherland and Miss Muir should be notified of patients transferred to Knightswood and of the relevant diagnoses.

* There need not be four lines to the room : fewer lines with a total of four extensions would serve.

+ The question of secretarial cover for the Radio-isotopes Department will be considered by us later in a separate paper.

7.7. If, in spite of these measures, work continues to accumulate as a backlog, then an extra secretary (and not a non-typing clerk) should be employed, and should work at least near, if not with, the other three (or four).

7.8. On a wider basis, we recommend the introduction of a hospital messenger service, the ending of the present restricted service offered by the Records Department (see paragraph 6.5.2.), and the introduction of "clinic receptionists" in the Out-Patient Department.

8. SUMMARY

- 8.1. An investigation into the organisation and methods of the secretarial staff in the Department of Medicine in the Western Infirmary, Glasgow, is described.
- 8.2. The reasons for the present unsatisfactory situation are discussed, and recommendations are made to improve matters.

9. ACKNOWLEDGEMENTS

I wish to thank all the staff of the Department of Medicine for their great co-operation during this investigation, and Mr. Ian Laing, my Research Assistant, for his invaluable help in the preparation of this Paper.

CHAPTER SIX.

T R A N S P O R T O F D O C U M E N T S

"Organisation is not for ever, it is only the method we happen to be using to divide work and responsibilities in order to achieve particular ends by particular means."

(Laver, 1965)

The Network.

I have already mentioned the difficulties of transporting documents in connection with the typing of letters, but we must remember that there is a continual flow of all kinds of record material between all hospital departments. For example, case notes travel to and from file in the records department; X-Rays to and from file in the X-Ray department; request forms from wards and clinics to, and investigation reports back from laboratories etc., sometimes investigations are done outwith the hospital, which brings the external mail into the network.

Nor can these record items be considered in isolation. Laboratory specimens of blood, urine, sputum, and so on must be transported quickly and safely to the laboratories; supplies of intravenous fluids delivered from the transfusion centre; instruments taken to and fetched from the central sterile supply department; and drugs delivered to the wards from the pharmacy department.

If this flow is slowed, an individual patient's clinical management may be impeded, and his recovery delayed or even prejudiced. This will be reflected, in turn, in the morbidity and mortality statistics and the bed-occupancy rate. How can the flow be organised efficiently? There are 3 methods, each of which I shall consider in turn, beginning with the most sophisticated.

Electronic Methods.

It is popular to prophesy a time when documents can be scrutinised at will in the ward or clinic by a visual display unit (V.D.U.), with on-line real time access to a computer store: data will be selected by operating a keyboard and will be displayed on a television screen (Anderson, 1967). I suggest that this method can be dismissed at present as a practical proposition, when there is insufficient money even to provide secretaries with adequate desks and typewriters.

On the other hand, increasing use is being made, in specific circumstances, of videotape recordings (V.T.R.) to store and transmit documentary material such as angiocardiograms. The particular benefit here is the almost instantaneous facility for viewing the recorded tape, as against the delay involved in processing conventional cine-film: the tape can be inspected before the patient leaves the operating table (Ampex, 1967).

Mechanical Methods.

A pneumatic tube conveyor system has been built into several new British hospitals, but opinions remain sharply divided about the value of such apparatus. The usual manufacturers are the Lamson Engineering Co. Ltd, of London, and the usual system consists of 4" diameter vacuum lines and carriers measuring $27\frac{7}{8}$ " in diameter by $12\frac{3}{8}$ " in length (internally).

The circuit of lines has numerous "stations", and a carrier is "addressed" by dialling a code on indicator rings on its body. This setting completes a local electrical circuit just before the destination is reached, and the carrier is deflected into the station. Indicator panels can be incorporated to localise faults, and a reject station to discharge faulty or incorrectly addressed carriers.

In the West Cumberland Hospital in Whitehaven, completed in 1964, the Lamson system is regarded as a relative failure (Ballinger, 1967). The lines block frequently; the carriers are too small to accommodate more than one unit file at a time; laboratory specimens are not sent because of the risks of breakage (which contaminates the system) and deterioration (e.g. haemolysis); and empty containers are not regularly returned to their source of origin (this, of course, reflects on staff work routine rather than on the mechanical system itself).

However, in Addenbrooke's New Hospital in Cambridge, I found the system very popular, especially with the nursing staff (Mitchell, 1966). Case notes were regularly sent by tube, although the folders did tend to deteriorate through being rolled up; X-Ray films

were not sent because of this folding and because they were often too large anyway; laboratory specimens were sent fairly often, protected by foam sponges in the carriers. Dangerous Drugs were delivered by hand, on principle, although a special locking container had been supplied by the manufacturers. In 1962, in stage I of the New Hospital, a survey showed that the pneumatic tube system had reduced the amount of errand running by between 40% and 45% (Bullwinkle, 1966).

Mechanical conveyors of other designs can be usefully employed in specific situations. The Criminal Record Office in New Scotland Yard has a Sovex horizontal selective document conveyor, which is 1,700 feet long (the longest in England), and consists of open trays on an endless track, moving at 4 trays per minute through a series of offices. Each tray has a set of keys on it, reminiscent of a typewriter, on which one dials the address, and which operate a lever to engage with a trip at the destination, so that the moving tray tips momentarily and discharges its load into a receiving basket.

The same building has a Lamson selective vertical document conveyor, serving 19 floors of one block and, via a link across the basement, 8 floors of another block. This is the first conveyor of its type in this country to have an interconnection between 2 vertical shafts, and is estimated to do the work of about 20 messengers with trolleys (Metropolitan Police, 1967).

The advantages of speed and economy inherent in mechanical systems are obvious. An additional important factor is the continual inflow of small loads of work, which is important in preserving staff morale. Unfortunately, of course, installation of such equipment on a large scale in existing hospitals would be economically prohibitive, which leaves us with the third method of transport.

Messengers.

At present, in most hospitals, documents are transported by human hand. An infrequent collection and delivery service by porters is supplemented by ad hoc journeys by various members of Unit and departmental staff, ranging from secretaries to maids. This leads to an enormous waste of time, and to the temptation to stockpile semi-urgent material into batches.

The report which follows shows how large is the total work involved, and how rational would be the creation of a frequent internal mail service, such as exists in some large commercial premises (Laing, 1966).

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A HOSPITAL MESSENGER SERVICE.

A trial in the Western Infirmary, Glasgow.

JUNE/JULY 1966.

M.R.R.G. REPORT NO. 8.

First published: July 1966.

We have already commented, in other Reports, on the need for a messenger service in the Western Infirmary, Glasgow.

The trial described in this present Report was designed to examine in detail the messenger requirements for one Unit in the Infirmary.

Dr. Richards' Unit of Internal Medicine was selected for this trial and two members of our Research Group undertook to act as messengers for this Unit for the whole of one working week.

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1. UNIT CONCERNED.
2. METHODS.
3. RESULTS.
 - 3.1. Preliminary Remarks.
 - 3.2. Key to Tables.
 - 3.3. Summary Table.
 - 3.4. Daily Tables.
4. CONCLUSIONS.
5. ACKNOWLEDGEMENTS.

1. UNIT CONCERNED

1.1. Dr. Richards' Unit of Internal Medicine is situated on the third floor of the Western Infirmary (on the fourth if one counts the basement). It consists of two wards, each of 18 beds, and it houses the only artificial kidney in the Infirmary.

1.2. We selected this Unit for the trial for several reasons. Firstly, we were already personally acquainted with all the staff: this avoided any "false starts" to the trial through personal misunderstandings. Secondly, the Unit was immediately adjacent to our office in the Infirmary, which was accordingly used as a "call-station" in the trial. Thirdly, the Unit seemed to us such that any findings in the trial conducted here could quite reasonably be applied to the Infirmary as a whole. That is to say that, as far as a trial of a messenger service was concerned, this Unit would well serve as a "typical unit" in the Infirmary.

2. METHODS

2.1. The trial was undertaken during the course of one working week, Monday 27th June to Friday 1st July, inclusive, continually between the hours of 9.0 a.m. and 5.0 p.m.

2.2. During this time the two Secretaries of our Research Group were on call for all the messages for the Unit, none of which were undertaken, as they would usually have been, by members of the Unit Staff.

2.3. Frequently the Unit Secretary performs many such tasks, as it is part of her normal duties, when requesting documents from the Records Department for clinics, etc., to go personally into the Department, consult the master index, and extract the documents from file. This, it should be stressed, is routine practice in the Western Infirmary, whereas in many other hospitals documents required from the Records Department are located by the departmental staff and are presented to messengers at some reception point in the department.

2.3.1. In this respect, therefore, the Records Department in the Western Infirmary provides a more limited service than in some other hospitals.

2.3.2. It will be appreciated, moreover, that, if the messenger personally locates such documents in file, the messenger must necessarily be at least a semi-skilled member of staff and that, were a full-time team of messengers appointed, they could hardly be expected to undertake such location of documents.

3. RESULTS

3.1. PRELIMINARY REMARKS

3.1.1. The following figures show in detail the messages undertaken. The immediate source of each request is specified in the tables as either the staff of one of the two wards, or the Unit Secretary herself. This is to indicate the involvement of the Secretary in arranging for messages for the Unit to be undertaken.

3.1.2. Reference is made to the Records Department annexe. This is situated in a terrace house in a street several hundred yards from the Infirmary. This annexe houses over 100,000 case sheets and is at present being reorganised as a non-current store. At present there are frequent delays in obtaining case sheets filed in this annexe, but these delays can be expected to decrease in number as the reorganisation proceeds.

3.1.3. Transfer of documents from this annexe to the main Records Department is undertaken by the Records Department staff, and all such documents required by Units in the Infirmary are collected by personnel from the Units, at the main Records Department.

3. 2. KEY TO TABLES.

- C : Collection of item to take to Unit.
- D : Delivery of item from Unit.
- * : This task included referring to the master index in the Records Department.
- Ø : This task included arranging for delivery of the item from the Records Department annexe to the main Records Office.
- X : This information was, in fact, obtained by telephone, although a journey is recorded.
- ∅ : This task included referring to the index in the X-Ray Department.
- μ : Two messengers in operation concurrently.

3.3. SUMMARY TABLE

The following figures show the numbers of messages undertaken for the whole of the five days in terms of source/destination and time of day.

[illegible]

3.4. DAILY TABLES.

27th June, 1966.

Start	Request from		C.	D.	Items	No.	Source/ Destination	Finish	Time Spent
	Ward	Secy.							
<u>a.m.</u>								<u>a.m.</u>	<u>mins.</u>
9.20	1			1	Blood	15	Haematology		
	1		1		Blood Bottles	2	Pathology	9.45	25
9.45	1			1	Request Cards	2	X-Ray		
	1			1	E.C.Gs.	5	Cardiology	9.55	10
10.25	1			1	Blood	5	Haematology	10.35	10
11.30		1	1		Case Sheet *	1	Records		
		1	1		Appt. Cards	2	Records	12.00	30
<u>p.m.</u>									
12.15	1			1	Blood	1	Haematology		
	1			1	Blood	2	Biochemistry	12.22	7
1.40	1			1	E.C.Gs.	37	Cardiology	1.53	13
2.00	1		1		Case Sheet	1	Records		
		1	1		Films	2	X-Ray		
	1			1	Blood	2	Haematology	2.35	35
2.50	1		1		Films	1	X-Ray	3.10	20
3.10	1			1	Blood	2	Biochemistry	3.20	10
3.30	1		1		Blood	3	Gardiner Inst.	3.35	5
3.35	1		1		Blood	1	Blood Bank	3.45	10
3.45	1			1	Needles	8	Pharmacy		
	1			1	Blood	5	Haematology		
	1			1	Blood	1	Gardiner Inst.	4.02	17
4.05	1			1	Urine	9	Bacteriology	4.11	6
4.25		1	1		Case Sheet	1	Records	4.42	17
TOTAL	18	4	9	13		108			3h.35m

DAY TWO

28th June, 1966.

Start	Request from		C.	D.	Items	No.	Source/ Destination	Finish	Time Spent
<u>a.m.</u>	Ward	Secy.						<u>a.m.</u>	<u>mins.</u>
9.30	1			1	Large Container	1	Pharmacy		
	1			1	Blood	1	Pathology		
	1			1	E.C.Gs.	4	Cardiology		
	1			1	Blood	3	Haematology		
	1			1	Blood	5	Biochemistry		
	1			1	Films	1	X-Ray		
	1			1	Blood	1	Atheroma Unit		
	1			1	Request Cards	3	X-Ray	10.20	50
10.45	1			1	Urine	1	Biochemistry	10.50	5
10.50		1	1		Case Sheet M	1	Records		
		1	1		Case Sheet	1	Records	11.15	25
11.30	1			1	Blood	2	Haematology	11.35	5
11.50	1			1	Blood	1	Haematology	12.00	10
2.10	1			1	Blood Bottles	5	Blood Bank		
	1			1	E.C.G.	1	Cardiology	2.20	10
2.25	1			1	Films	3	X-Ray	2.36	11
2.48	1	Urgent		1	Request Card	1	X-Ray	3.00	12
3.20	1			1	Films	1	X-Ray		
		1		1	Case Sheets	17	Records		
		1		1	Case Sheets	17	Records	3.40	20
4.00	1			1	Urine	1	Pathology		
	1			1	Urine	1	Bacteriology		
	1			1	Urine	1	Biochemistry	4.11	11
TOTAL	19	4	2	21		73			2h.39.

30th June, 1966.

Start	Request from		C.	D.	Items	No.	Source/ Destination	Finish	Time Spent
	Ward	Secy.							
a.m.								a.m.	mins.
9.30	1			1	Blood	3	Haematology		
	1			1	Blood	11	Biochemistry		
		1		1	Mail	5	Mail Box		
	1			1	E.C.G.	1	Cardiology	9.45	15
10.25		1		1	Case Sheets	2	Social Service		
		1		1	Case Sheets	14	Records	10.35	10
11.10	1			1	Blood	1	Haematology	11.20	10
11.45	1		1	1	Stock Bottle	1	Pharmacy	11.55	10
12.20	1		1		Blood	1	Blood Bank	12.30	10
2.10		1		1	Case Sheet	1	Sister Wd.C.3:	2.15	5
2.25	1			1	Film	1	X-Ray		
		1	1		Doctor's address X	1	Records		
		1	1		Patient's "X"	1	Records		
		1	1		Patient's "	1	X-Ray	2.45	20
3.00	1			1	Blood	3	Haematology		
	1			1	Blood	3	Biochemistry	3.15	15
TOTAL	9	7	5	12		50			1h.35m

4. CONCLUSIONS.

- 4.1. During the trial week (5 working days), 98 visits to various departments were made. The total time the messengers were away from the Unit was 14 hours 42 minutes, or on average 2 hours 57 minutes each day.
- 4.2. The Western Infirmary comprises some 660 in-patient beds. In the year ending 31st March, 1965, 19,342 in-patients were admitted, and there were in addition some 395,000 out-patient consultations.
- 4.3. In the light of these figures the results of our trial clearly indicate the need for an organised messenger service in the Infirmary. The alternative method of installing a pneumatic tube conveyor system, such as is in use in new buildings like Addenbrooke's New Hospital in Cambridge, is not economically feasible.
- 4.4. In organising such a service the remarks in paragraph 2.3. must be borne in mind.

5. ACKNOWLEDGMENTS.

We wish to thank the staff of the various Units and departments of the Western Infirmary for their co-operation during this trial.

CHAPTER SEVEN.

LABORATORY RECORDS

"It is impossible to divorce the laboratory report from the whole system of laboratory record keeping."

(Carter, 1967)

"Perfection, we know, is finality; and finality is death."

(Parkinson, 1965)

I do not propose to discuss laboratory record systems in great detail, if only because automation is being introduced on an increasingly large scale to replace manual technical and clerical procedures (Payne, 1966; Laver, 1965; Wayne, 1966). Sometimes, however, there are long delays in the return of printed investigation results from laboratories for quite mundane reasons: in one hospital a shortage of typists resulted in even the reports of haemoglobin values being delayed for up to 10 days after the tests were made (Mitchell, 1963).

A radio-isotopes department presents all the special features one is likely to encounter in any laboratory: patients must often attend personally, they must be tested at precise times, radio-active materials are used, and much of the work is research rather than routine. It can serve for present purposes, therefore, as a particularly complex example of a laboratory system.

The following report resulted from a request that a survey

be made to determine the secretarial requirements of a radio-isotopes department. It transpired that not only was there a need for a departmental secretary, but that the whole document procedure and design could usefully be revised. The reader will notice, incidentally, that minor changes in some of the investigations themselves had already taken place since 1966 (see M.R.R.G. Report No.3).

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TOWARDS LESS WRITING

An investigation in the Radio-Isotopes Department,
Western Infirmary, Glasgow.

MARCH TO JUNE, 1967

M.R.R.G. REPORT NO. 22

First published: August, 1967.

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 - 9.2. THE NEED FOR A SECRETARY
10. RECOMMENDATIONS
11. SUMMARY
12. ACKNOWLEDGEMENTS.

1. INTRODUCTION

- 1.1. In February, 1967, the Professor of Medicine asked the Medical Records Research Group to survey the existing secretarial services in the Department of Medicine in the Western Infirmary, and to assess the secretarial requirements of the Radio-Isotopes Department, which at present has no such staff.
- 1.2. Our Paper entitled "How Many Secretaries?", issued in June 1967, specifically excluded the Radio-Isotopes Department, because our survey there had not been concluded.
- 1.3. Early in the course of our survey it became clear that the clerical procedures in the Radio-Isotopes Department could usefully be streamlined, and various forms redesigned, so this present Paper contains a great deal more detail about form design and clerical procedures than was originally expected to be necessary.

2. METHODS OF INVESTIGATION

- 2.1. The purpose and methods of the investigation were explained personally to all members of the Departmental staff.
- 2.2. They were asked to comment on any aspects of the present situation, and to voice any complaints they had, and what they thought should be done about these complaints.
- 2.3. For three consecutive weeks, thereafter, a secretary from the Medical Records Research Group was allocated to the Radio-Isotopes Department, and all work of a secretarial nature was referred to her.
- 2.4. In this way, by means of "bar-charts"*, with pre-determined work categories, a quantitative and qualitative survey of secretarial work in the Department was obtained.
- 2.5. One extra copy of all typed work was made so that this, itself, could be classified and quantified.

* see "How Many Secretaries?", paragraph 5.2.

3. GENERAL DESCRIPTION

3.1. Location

3.1.1. The Radio-Isotopes Department is situated in the Gardiner Institute in the Western Infirmary. Patient reception and radio-active studies are carried out on the ground and first floors, and stable chemical studies in the laboratories on the third floor.

3.1.2. These latter laboratories serve the research requirements of the whole of the Department of Medicine, but stable iodine studies are conducted there by a team of technicians specifically attached to the Radio-Isotopes Department. Occasional estimations of other stable items are undertaken for the Department by technicians attached to other research teams.

3.2. Administration

The Department is administered by the N.H.S., and not by the University of Glasgow.

3.3. Staff

3.3.1. Physicians

Dr. Alexander (Consultant-in-charge), and
Dr. Harden (Registrar).

3.3.2. Physicists

Total three.

3.3.3. Laboratory technicians

Two full- and one part-time employed on radio-active measurements, and four on stable iodine chemistry.
Notional total = $6\frac{1}{2}$.

3.3.4. Secretaries/Receptionists

Nil. As noted in our Paper "How Many Secretaries?", some typewritten work, mostly letters to general practitioners, stencilled instructions for patients, and research papers for publication, is presently done for the Radio-Isotopes Department by secretaries working elsewhere in the Department of Medicine. This, however, is a policy of expediency, and in no way lessens the need for secretarial staff to be specifically employed in the Radio-Isotopes Department.

4. WORK SPECIFICATION

4.1. General Remarks

4.1.1. Although the Radio-Isotopes Department provides a diagnostic service for hospitals throughout the West and North of Scotland, especially as regards thyroid function tests, it began as, and remains essentially a research unit. Even the details of procedure of the I-132 tests have been modified in the past 12 months.

4.1.2. Radio-active laboratory tests vary in detail from hospital to hospital, so some of the procedures which are at present used in this Department are described at length in the following paragraphs. These details are given mainly to enable the reader to appreciate the complexity and the exactitude of the work involved.

4.2. Second Tests

It cannot be over-emphasised that, if any error in timing is made in the routine of many of the radio-active tests described (particularly the routine I-131 test), the procedures cannot be soon repeated. This is because the first test dose of the isotope modifies the response to a subsequent dose.

4.3. Abbreviations

* Tests where the personal attendance of the patient in the Department is necessary.

Ca = calcium.

Co = cobalt.

Cr = chromium.

Fe = iron.

I = iodine.

Sr = strontium.

$t_{\frac{1}{2}}$ = the time when half the original radio-activity remains.

T₃ = triiodothyronine.

Tc = technetium. This is an artificial element of atomic number 43. Tc-99m is an unstable isomer which is a pure gamma-ray emitter, has a half life of 6 hours, and is manufactured from molybdenum-99.

4.4. Routine I-131 Test * (for thyroid function).

4.4.1. A dose of I-131 is given to the fasting patient orally at time zero. Thyroid gland uptake is measured (by "neck count") at 5 and 48 hours, and a venous blood specimen taken at 48 hours. In suspected hypothyroidism, all urine is collected from time zero to 48 hours.

4.4.2. When the patient is in another hospital, the dose of I-131 and the blood and urine samples may be sent by post, and the "neck count" omitted, in which case the information on thyroid function is much less comprehensive and satisfactory.

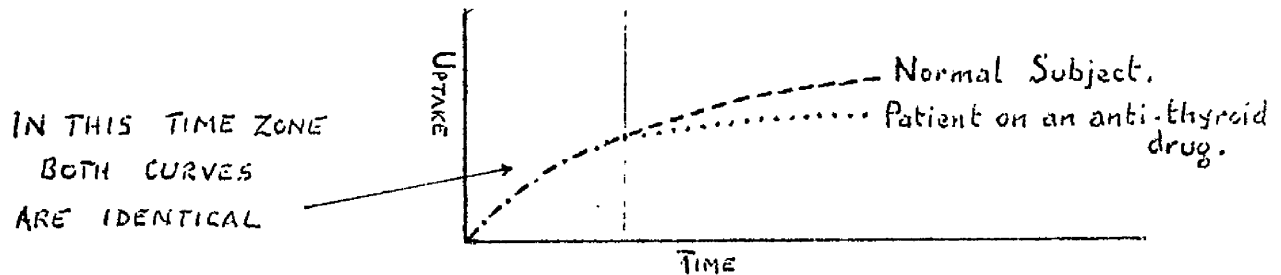
4.5. Oral I-132 Clearance * (for thyroid function).

4.5.1. The half-life of I-132 is 2.4 hours, compared with 8.04 days for I-131. A dose of I-132 is given to the fasting patient orally at time zero. Thyroid gland uptake is measured at 60 and 150 minutes, and venous blood taken at 105 minutes. Saliva is collected (by spitting) from 95 to 115 minutes. The patient empties his bladder at time zero, and urine is collected at 150 minutes. During the whole time of the test the patient must not eat or drink.

4.5.2. This test is employed in preference to the routine I-131 test when the patient is less than 18 years old, or has had some previous medication which would confuse the I-131 results. In most instances, therefore, the test is actually ordered by one of the physicians in the Department of Medicine.

4.6. Intravenous I-132 Clearance * (for thyroid function).

4.6.1. This test is used to measure thyroid function in patients on anti-thyroid medication. With I-132 one can get very early thyroid uptake measurements, which are essential, because anti-thyroid drugs affect only the later part of the uptake curve.



Intravenous administration of I-132 obviates interference with the test readings by absorption factors in the alimentary tract.

4.6.2. At time zero the fasting patient is given a dose of I-132 intravenously by a physician. At 2 and 20 minutes, thyroid uptake is measured by neck count, and venous blood is taken. Saliva is collected from 15 to 25 minutes.

4.6.3. This test, too, is usually ordered by one of the physicians in the Department of Medicine.

4.7. P.B.I. (protein-bound stable iodine) (for thyroid function).

This is frequently estimated in the chemical laboratory as part of one of the radio-iodine procedures, but on other occasions is done as a lone procedure.

4.8. T3 Resin Uptake (for thyroid function).

In this test a specimen of the patient's serum has added to it a dose of triiodothyronine (T3) containing I-131. What T3 is not taken up by the thyroxin-binding proteins in the serum is then removed by a resin, the radio-activity of which is measured. This test, although involving radio-active materials, is done in the chemical laboratory.

4.9. Chromium Test * (for red blood cell survival).

20 ml of the patient's blood is anticoagulated and incubated for 30 minutes with a measured dose of Cr-51 (as chromate); it is then washed with saline for one hour and injected intravenously into the patient. Blood samples are taken and radiation counts are made over the spleen, liver and heart, at 2 or 3 day intervals up to 4 weeks later, until $t_{1/2}$ is reached.

4.10. Iron Meal * (for intestinal absorption of iron)

At time zero the fasting patient is given a dose of Fe-59 in a standard meal. At 4 hours and 14 days total body radiation counts are made; the latter time is not critical as it is assumed that, by then, absorption of Fe-59 is complete, and the gut lumen is clear of the material.

4.11. Iron Utilisation Test * (for erythropoietic activity).

The fasting patient is given a dose of Fe-59 intravenously at time zero. Plasma samples are taken at 5, 10, 20, 40 and 80 minutes (though these times are not critical) until $t_{\frac{1}{2}}$ is reached. Radiation counts are made over the sacrum, spleen, liver and heart at, strictly, time zero, 30 mins, 60 mins, 6 hr, 24 hr, 48 hr and 96 hr. Venous blood is taken at 14 days (not a critical time) for estimation of Fe-59 content. This test also involves the estimation of plasma stable iron.

4.12. Strontium and Calcium Studies *

These are used to measure mineral kinetics at bone level. In one test, the patient is given an intravenous dose of Sr-85, and is then seen three times a week for the first four weeks, then once a fortnight for a further six months, on which occasions a venous blood sample is taken, and a whole body radiation count made. In other tests, the intestinal absorption of Sr-85, Ca-45 or Ca-47 is measured by giving an oral dose of the substance at time zero, and taking a venous blood sample at 2 hours.

4.13. Schilling Test (for vitamin B12 deficiency)

At time zero the patient is given an oral dose of vitamin B12 containing a measured quantity of Co-58. At 2 hours 1,000 μ G of stable vitamin B12 are given intramuscularly. Urine is collected from time zero to 26 hours, and measured for Co-58. If more than 7% of the original dose of Co-58 is excreted in that time in the urine, no vitamin B12 deficiency is present; if less than 7% is excreted, then deficiency exists.

4.14. Blood Volume Estimation

At time zero the patient is given an intravenous dose of I-131, tagged to serum albumin. Venous blood is taken at 20 minutes, and is processed over a period of 30 minutes for packed cell volume and radiation count of plasma.

4.15. Protein Loss Study (for protein-losing enteropathy).

The patient is given an oral dose of the ion exchange resin I.R.A. 400 (Cl), closely followed by an intravenous dose of serum albumin or polyvidone labelled with I-131. The administration of resin is continued 5 times a day for 14 days, and all faeces collected during that time.

4.16. Other Studies *

Noteworthy amongst these are the measurement of the secretion of halogens, Tc-99m and rhenium in saliva, and various scanning techniques, particularly of thyroid, stomach, liver and brain, using I-131 and Tc-99m.

5. WORK LOAD5.1. Radio-active procedures

In June 1967 the following numbers of procedures were done:-

Routine I-131 tests	95	
Oral I-132 clearances	32	
Intravenous I-132 clearances	98	
Chromium tests	2	
Iron meals	8	
Iron utilisation tests	2	
Strontium and calcium studies	4	(begun)
Schilling tests	9	
Total	<u>250</u>	

5.2. Lone * P.B.I. estimations

In June 1967 these totalled 379, being composed as follows:-

Source of request	No. of tests done		
	June 67	June 66	June 65
Dept. of Medicine in-patients	30	27	32
" out-patients	140	113	88
" total	170	140	120
Other Western Infirmary Wards and clinics	68	43	10
Other hospitals	141	56	8
Totals	379	239	138

The annual increase in requests from all sources is noteworthy, especially those from other hospitals.

* See paragraph 4.7.

6. SOME PRESENT CLERICAL PROCEDURES

6.1. Routine I-131 Tests (Out-Patients).

6.1.1. These are begun each Monday morning.

6.1.2. When a Request Form (see overleaf) is received in the Department for a patient, it is filed with other such forms received during the week.

6.1.3. On a Tuesday, the technician takes from the filing cabinet the Request Forms which have accumulated during the past week, and for each patient she enters on a stencilled Appointment Letter (see overleaf) the date and times he/she should attend on the following Monday and Wednesday. The patient's name and address are not entered on the Letter, but only on the enclosing envelope, which is then placed in the mail basket in the librarian's office on the ground floor of the Gardiner Institute.

6.1.4. The patient's name and appointment date and time are entered in an Appointments Diary.

6.1.5. When the patient arrives on the Monday morning he/she is asked whether a similar test has been done previously. If "yes" the previous Record Card is removed from file.

6.1.5.1. These Record Cards (see overleaf) are kept in annual, alphabetical order, and one technician always made out a new Card for every patient-occasion, whilst the other used one (updated) Card per patient. During our survey, the procedure was standardised so that one (updated) Card per patient was used.

6.1.6. The patient's name and address, age, etc., are entered (or corrected) on the Record Card, and a Counting Sheet (see overleaf) is similarly completed.

6.1.6.1. There is one Counting Sheet per patient-occasion.

6.1.7. The patient is then given the oral dose of I-131, and the various initial results during the next two days are entered in a notebook on the laboratory bench.

6.1.8. The initial results are then transferred to the Counting Sheet, and the final results calculated thereon.

6.1.9. The final results are copied from the Counting Sheet to (separately) the Record Card and the Request Form.

PART I

N.B. 1 PREGNANT PATIENTS MUST NOT BE SUBMITTED TO RADIOIODINE STUDIES.

2 PATIENTS UNDER THE AGE OF 18 YRS. SHOULD BE REFERRED TO R.I. DEPT. AND A SUITABLE TEST ARRANGED.

Provisional diagnosis :

Clinical summary :

Thyroid : Not palpable..... Diffuse..... Nodular.....

Previous radioiodine test carried out on, (Date)..... Lab. Report No.....

PREVIOUS THERAPY	PREPARATION	DATES
Iodine		
Radioiodine		
Diagnostic X-rays using iodine contrast media		
Anti-thyroid drugs		
Thyroid hormone		
Thyroidectomy		
Radiotherapy to thyroid		

PART II

Lab. Report No..... **310**

RADIOISOTOPES LABORATORY, WESTERN INFIRMARY, GLASGOW Section 1

Patient's Name..... Age..... Sex.....

Address..... Unit No.....

Ward..... I.P./O.P. Requested by..... Date.....

FOR USE OF LABORATORY ONLY

Section 2

Dose of..... μ c. I^{131} administered on..... at..... a.m./p.m.

T.R.	
------	--

Dose of..... μ c. I^{131} administered on..... at..... a.m./p.m.

T.R.	Gland uptake -- % dose	Normal range
5 hours		15 - 45
48 hours		-
Blood -- 48 hours % dose/litre		
T.P.L. P.B.L.		0 - 0.4
Urine -- volume	% dose	
0 - 8 hours		26 - 50
8 - 24 hours		6 - 19
24 - 48 hours		0 - 9
0 - 48 hours		38 - 69
Clearance Indices		
T		2.7 - 10
K ₁		4.4 - 11
K ₀		4.9 - 12

A.T.R.

OPINION

Date..... Signed.....

WESTERN INFIRMARY, GLASGOW

GARDNER INSTITUTE OF MEDICINE

RADIOISOTOPES DEPARTMENT

RADIOIODINE TEST REQUEST FORM

When requesting radioiodine tests of thyroid function, please complete PARTS I and II. Request forms for IN-PATIENTS must be sent to the Radioisotopes Dept., Gardner Institute, by mid-day on Sundays so that the test may be carried out on the following Monday. Request forms for OUT-PATIENTS can be handed in at any time and the names will be placed on the waiting-list. Out-patients will be notified direct of the date of the test together with instructions. Request forms and specimens for IN-PATIENTS in Hospitals other than the Western Infirmary, should be sent to the Radioisotopes Dept. Doses for these patients should be ordered directly from the Regional Physics Department (DOU 0577).

PROCEDURE FOR IN-PATIENTS

Patients should have theatre breakfast only on the first day of the test. The tracer dose of Iodine will then be brought direct to them between 9.30 and 10.00 a.m., after which they may have their meals normally.

A 20 ml. BLOOD SAMPLE SHOULD BE TAKEN BY THE RESIDENT AT 48 HOURS AND PLACED IN THE OXALATED BOTTLE PROVIDED (A HEPARINISED BOTTLE MUST NOT BE USED).

For certain in-patients with suspected hypothyroidism the following urine collections will also be necessary:—

- (a) Urine passed between 9.30 a.m. and 5.30 p.m. on Day One should be collected into bottle 1. Urine must be passed at 5.30 p.m. to ensure a full collection.
- (b) Urine passed between 5.30 p.m. and 9.30 a.m. on Day Two should be collected into bottle 2. Urine must be passed at 9.30 a.m.
- (c) Urine passed between 9.30 a.m. on Day Two and 9.30 a.m. on Day Three should be collected into bottle 3. Urine must be passed at 9.30 a.m.

N.B. Please make a note of any error in the collection so that fallacious results may be avoided.

If a urine specimen is discarded by mistake or is placed in the wrong bottle, a rough estimate of its volume and destination will be helpful.

Hospitals sending collections to the Radioisotopes Dept. are requested to send 20ml. aliquots from each collection with a note of the volumes of the three collections.

34775

N.B. You will not be detained for more than 30 minutes at any of these times.

WESTERN INFIRMARY

Tel. WEST 8822
Extension 38

Gardiner Institute,
44 Church Street,
Glasgow, W.1.

RADIOIODINE TEST

Instructions to Out-patients:

1. On the morning of MONDAY
breakfast should consist of a slice of toast and one cup
of tea or coffee.
2. On that morning you should report to the Radioisotope
Laboratory in the Gardiner Institute, Western Infirmary,
44 Church Street (ground floor) at
3. After the first part of the test you will be given a time at
which to return, approximately 5 hours later.
4. You will also be given a time to return on
WEDNESDAY
approximately between 9 and 11 a.m.

(following para. 6.1.9.)

K904

313

WARD..... REQUESTED BY.....

[illegible]

Record Card, each side of

PREVIOUS THERAPY	DATES

REMARKS

Name: Date:

Case Sheet No.: Dose administered:

Gland uptake

4 Hours		48 Hours	
Standard	_____	Standard	_____
Av. C.R.	_____ c/100 sec	_____	_____ c/100 sec
Bgd.	_____ c/100 sec	_____	_____ c/100 sec
C.R.	_____ c/100 sec	_____	_____ c/100 sec
% uptake	_____	_____	_____

Dose Standard in Liquid Counter

Volume of dose = 10 ml; Dilution of dose for standard = 1 : 1000;
Volume counted = 5 ml

Counts/5 ml standard = X c.p.m. = _____ c.p.m.
(S)

Counts for total dose = $\frac{X \times 1000 \times 10}{5}$ c.p.m.

48-Hr Plasma

	CR	_____	c/5 mins/5 ml	
	BG	_____	c/5 mins	
%. Net	CR	_____	c/5 mins/5 ml	(Y)

%. % initial dose per litre of plasma = $\frac{\text{c.p.m./litre of plasma} \times 100}{S} = \frac{Y \times 1000}{5 \times 5}$

$\frac{5 \times 100}{X \times 1000 \times 10}$

= $\frac{2Y}{X} = \frac{2 \times \text{_____}}{\text{_____}} = \text{_____}$

48-hr P.B.I. 131

	CR	_____	c/5 mins/5 ml	
	BG	_____	c/5 mins	
%. Net	CR	_____	c/5 mins/5 ml	(Z)

%. % initial dose per litre of plasma = $\frac{ZZ}{X} = \frac{2 \times \text{_____}}{\text{_____}} = \text{_____}$

Urine

Standard		C.P.M. per μ c		
0-8 hrs			8-24 hrs	24-48 hrs
	C.P.M.		C.P.M.	C.P.M.
Bgd.	C.P.M.		C.P.M.	C.P.M.
C.R.	C.P.M.		C.P.M.	C.P.M.

% initial dose

%. 0 - 48 hrs

T =

$K_t =$

$K_u =$

Counting Sheet

- 6.1.10. The Counting Sheet is then filed in a lever arch file in alphabetical and then date order.
- 6.1.11. The Request Form, with the final results now entered, is sent to Dr. Harden who writes in his opinion re. the diagnosis, in the light of (a) the clinical details and previous medication and (b) the I-131 results.
- 6.1.12. The Request Form is sent back to the laboratory, where Dr. Harden's opinion is copied on to the Record Card.
- 6.1.13. The Record Card is filed.
- 6.1.14. Part I of the Request Form is destroyed (although it is generally agreed that the details of clinical findings and previous medication are of permanent value), and Part II sent out as a report to the source requesting the test.
- 6.1.15. Sometimes Dr. Harden suggests further diagnostic procedures (such as P.B.I.) would be useful, in which case the relevant new request forms and containers are sent out with Part II of the Request Form.
- 6.2. Routine I-131 Tests (other than out-patients)
- 6.2.1. When the patient is an in-patient, the technician takes the dose of I-131 to the ward on the morning of the test and states when the patient is due to attend the Department.
- 6.2.2. When the patient is in another hospital, the Radium Handling Room in the Western Infirmary sends out the dose of I-131, and the Department technician 'phones when the patient should attend (unless the modified postal procedure is being followed - see paragraph 4.4.2.).
- 6.2.3. It is essential for patients to attend on time, but quite often they are late because porters or ambulances are not available. The telephone link to outside hospitals is a tenuous one, due to overloading of the Western Infirmary switchboard, and, during our survey, one laboratory extension was out of order. When the telephone rings it is sometimes inaudible; and even if it is audible a technician cannot always leave a test procedure to answer it.
- 6.3. Oral I-132 Clearances
- 6.3.1. Only rarely is an I-132 Request Form used in this procedure, because most requests for I-132 studies come from Dr. Alexander or Dr. Harden who have themselves previously seen the patients. These patients may have special folders of documented results, if various tests are repeated at regular intervals, but we do not propose to consider this aspect further.

- 6.3.2. Let us assume, meantime, that a request for an I-132 oral clearance has come from outwith the Radio-Isotopes Department.
- 6.3.3. When the Request Form (see overleaf) is received in the Department, the patient's name, and date and time of the appointment are entered in a "Kardex" * Appointment Book.
- 6.3.4. The patient is notified when to attend on a stencilled Appointment Letter (see overleaf). The patient's name and address are not entered on the Letter, but only on the enclosing envelope, which is then placed in the mail basket in the librarian's office on the ground floor of the Gardiner Institute.
- 6.3.5. During the course of the test the initial results are entered in notebooks on the laboratory benches.
- 6.3.6. Final results of the radio-active assays are entered on the upper half of a Stable Iodine Studies Form (see overleaf).
- 6.3.7. Stable chemical results are entered on a Gardiner Institute Laboratory Report Form (see overleaf), which is sent downstairs, and these results are then copied on to the lower half of the Stable Iodine Studies Form.
- 6.3.8. The Stable Iodine Studies Form is presented to Dr. Harden, in conjunction with the original Request Form.
- 6.3.9. Dr. Harden writes a summary of the results, and his opinion, on an Iodine Metabolism Studies Form (see overleaf), which is then fixed with "Sellotape" over Part II of the Request Form.
- 6.3.10. Part I of the Request Form is destroyed, and Part II is sent out as a report to the source requesting the test.
- 6.3.11. The Stable Iodine Studies Form is filed in a lever arch file in alphabetical order. /
- 6.4. Intravenous I-132 Clearances
- The procedure is similar to that in the oral I-132 clearances, except that, instead of the white form headed "Stable Iodine Studies", a pink form headed "Early I.V. Clearance" is used (see overleaf).
- 6.5. Iron Utilisation Tests
- 6.5.1. The results for each patient are, after initial calculations, written in a quarto size book by the technician who did the test.

* a proprietary loose-leaf document.

/ on occasion, I-132 final results are also entered on a Record Card - see paragraph 6.1.5.1. et seq.

PART I

N.B. 1 PREGNANT PATIENTS MUST NOT BE SUBMITTED TO RADIO-IODINE STUDIES.

Provisional diagnosis :

Clinical summary :

Thyroid : Not palpable..... Diffuse..... Nodular.....

Previous radio-iodine test carried out on, (Date)..... Lab. Report No.....

PREVIOUS THERAPY	PREPARATION	DATES
Iodine
Radio-iodine
Diagnostic X-rays using iodine contrast media
Anti-thyroid drugs
Thyroid hormone
Thyroidectomy
Radiotherapy to thyroid

PART II

RADIO-ISOTOPES LABORATORY, WESTERN INFIRMARY, GLASGOW Section 1

Lab. Report No.....

317

Patient's Name..... Age..... Sex.....

Address..... Unit No.....

Ward..... I.P./O.P. Requested by..... Date.....

FOR USE OF LABORATORY ONLY

Section 2

Dose of..... μ c. I¹³¹ administered on..... at..... a.m./p.m.

1st Uptake:..... mins..... % Serum..... %/ml.

2nd Uptake:..... mins..... % Urine..... %/ml.

Corrected 1st Uptake (if I.V.)—Urine Vol..... ml.

THYROID CLEARANCE =..... \times =..... ml/min.

RENAL I. CLEARANCE =..... \times =..... ml/min.

P.B.I. =..... % Plasma Th. =..... % Urinary iodine =..... %

P.I.I. =..... \times =..... %

A.I.U. =..... \times \times 0.6 =..... μ /hr.

Urine creatinine..... mg% Serum creatinine..... mg%

Renal C₂ Clearance =..... \times =..... ml/min.

Renal Iodide clearance =..... =.....

Renal C₂ clearance =..... =.....

WESTERN INFIRMARY, GLASGOW
GARDINER INSTITUTE OF MEDICINE

RADIO-ISOTOPE DEPARTMENT

RADIO-IODINE I¹³² REQUEST FORM

Tel. No. Western 8822.
Ext. 38.

Radioisotopes Department,
Gardiner Institute of Medicine,
Western Infirmary.

RADIOIODINE CLEARANCE.

Instructions to Out-patients.

1. You should eat nothing for 3 hours prior to the test (except for 1 cup of tea and 1 slice of toast if desired, at least 1 hour before the test).
2. On / / 6 , you should report to the Radioisotope Department in the Gardiner Institute, (Ground floor), Western Infirmary, 44 Church Street, at 9.15 a.m./1.0 p.m.
3. You should be prepared to remain for 3 hours.
4. After the start of the test there will be an interval of 1 hour when you may have something to eat if desired.
5. Fish should not be taken 48 hours prior to any of the tests but otherwise you should continue to eat the same quantity of fish between tests.
6. You should notify us before taking any cough bottle or bronchial or asthma medicines during the period of the tests.

(following para. 6.5.1.)

STABLE IODINE STUDIES

NAME:

DATE / /6

UNIT No. _ _ _ _ _

AGE: _ _ yrs.

SEX: M. F.

DIAGNOSIS:

Therapy:

THYROID: 1st Uptake: _ _ _ mins _ . _ % Serum _ . _ _ _ %/ml.

2nd Uptake: _ _ _ mins _ . _ % PBI _ . _ _ μ g%THYROID CLEARANCE: $\frac{\text{---}}{x} = \text{---} = \text{---} \cdot \text{---} \text{ ml/min.}$ RENAL I. CLEARANCE: $\frac{\text{---}}{x} = \text{---} = \text{---} \cdot \text{---} \text{ ml/min.}$

	<u>Saliva</u>	<u>Urine</u>
Time (mins)	_ . _	_ . _
Volume (mls)	_ . _	_ . _
I μ g%	_ . _	_ . _
%/dose/ml.	_ . _	_ . _
P.I.I.	_ . _	_ . _
A.I.U.	_ . _	_ . _

(following para. 6.5.1.)

WESTERN INFIRMARY, GLASGOW, W.I

GARDINER INSTITUTE LAB.

Lab. No.:

Name:

Hosp. No.:

Initialled as seen:

Phys./Surg.

Ward:

Age:

Relevant History:

Report:

SPECIMEN
/ INVESTIGATION:DATE OF
COLLECTION
TIME:DATE OF
REPORT:

(following para. 6.5.1.)

Gardiner Institute,
Western Infirmary,

IODINE METABOLISM STUDIES

NAME

UNIT NO. DATE:

Dr. WARD/CLINIC

	<u>Normal Range</u>
Th. Uptake 2 $\frac{1}{2}$ hrs.	(10 - 35)
Th. Clearance	ml/min. (8 - 40)
Plasma Inorganic iodine	ug/100ml. (0.08 - 0.60)
Absolute iodine uptake by thyroid	ug/hour (0.5 - 6.0)
Renal Clearance iodine	ml/min. (15 - 55)
P.B.I.	ug/100ml. (3.5 - 7.5)
Triiodothyronine resin uptake ('Triosorb')	(25 - 35%)
Resin Uptake Ratio	(0.80-1.20)
"Free thyroxine" index.	(2.2 - 7.1)
"Free thyroxine" factor.	(0.21 - 0.55)

OPINION:

(following para. 6.5.1.)

EARLY I.V. CLEARANCE

NAME: _____ UNIT NO. _____

SEX: M. F. AGE _____ yrs. DATE: _____

DIAGNOSIS:

THERAPY:

	Neck Uptake (2 min) _____ > 7% _____	Neck Uptake (2 min) _____ < 7% _____	Thyroid uptake _____
-----mins	- 7.0 0.93		-----%
-----mins	- 6.02 0.9398	100 x - 86 x 100 - .86 x	-----%
Plasma 1 ____ min	----- %/ml		Saliva
2 ____ min	----- %/ml		
(1 - 2)	----- %/ml	Time ____ mins	
Log Plasma 2	-----	Vol. ____ ml	
Log Plasma 1	-----	% dose	
	-----	I	----- ug%
	-----	PBI	----- ug%
Average plasma I ¹³¹	-----		
Thyroid Clearance =	-----	=	----- ml/min.
P I I	=	=	----- ug%
A I U	=	=	----- ug/hr.

6.5.2. The headings Heart, Spleen, Liver, and Sacrum are written down the left-hand side of the page seven times, and the headings Time, C/Min., Background, Net C/Min., Net Counts corrected for Standard, and Time after Injection, written along the top of the page once. After this, the technician writes in the calculated results, and then copies the whole page, headings and results, on to a blank sheet of paper, usually quarto size, which is inserted into the hospital case notes.

6.6. Chromium Tests

6.6.1. The results for each patient are written in a quarto size book as in the Iron Utilisation Tests (see paragraph 6.5.).

6.6.2. The side headings in this instance are written fourteen times, and then are likewise copied on to blank sheets of paper for insertion into the hospital case notes.

7. ADEQUACY OF PREMISES

- 7.1. We have already* commented adversely on various aspects of the Department, particularly the uncomfortable and cramped patients' waiting room, the patients' toilet being outwith the entrance door of the building, the lack of space, furniture and diagnostic instruments for clinically examining a recumbent patient who may be suddenly taken ill, and the total absence of nursing staff.
- 7.2. These matters are particularly relevant to the present survey, in that they predispose to disruptions in the delicate work routine in the Department, which may make unreasonable demands on technicians' time.
- 7.2.1. We note, however, that some mechanical alarm timers have now been provided.

* see our Paper "Survey of Professor Wayne's Unit" issued in April, 1966.

8. THE TRIAL SECRETARY

8.1. Definition of terms

The terms of classification of secretarial work used subsequently in this report will now be discussed.

8.1.1. Telephone Enquiries

All telephone calls in or out of the Department which occupied the time of the trial secretary.

8.1.2. Tracing records

Searching for any relevant previous records of patients, whether intra-Departmental documents or hospital case notes (unit files) in the wards or in the Records Department; this for any purpose other than form documentation or filing reports.

8.1.3. Appointments

Preparation and mailing of patients' appointments to attend the Department.

8.1.4. Form documentation

Entering patient identification details on laboratory forms prior to the arrival of results; this included searching for previous records.

8.1.5. Patient reception

All reception duties except form documentation.

8.1.6. Filing

Entering documents in Departmental files only.

8.1.7. Laboratory reports

Entering results on laboratory forms, either in handwriting or typescript; and despatch of these forms. The actual number of forms is entered in the category "Forms" (paragraph 8.1.16.).

8.1.8. Shorthand dictation

Including the physicians' opinions on various test results.

8.1.9. Messenger duties

Fetching or delivering any item to any other part of the Infirmary. Finding an item was not included in this category.

8.1.10. Unoccupied time

When the secretary was not working. This item was not included as an index of the recorder's honesty.

8.1.11. Miscellaneous duties

Any item of work not included in the above list, with the exception of typing; for example, printing stencil copies, and interruptions by other members of staff (medical, nursing or secretarial) for general information. Meal breaks were not included in this category.

8.1.12. Total working time

A working day was made from 9 a.m. to 5 p.m., with a lunch break of one hour and two tea breaks of 15 minutes each. This resulted in a notional working day of $6\frac{1}{2}$ hours (390 minutes), and we made a notional working week comprise five such days (totalling 1,950 minutes). All the following working figures are calculated on this basis.

8.1.13. Typing time was calculated as the total working time of the secretary, minus the total of bar-chart items. We feel that this is an acceptably accurate method of calculation, especially because typing work, being frequently interrupted, consisted of many small portions, and repeated rounding up* of the figures would make for an inaccurate total.

8.1.14. Typed lines were measured as quarto lines of finally corrected text. Letter headings, salutations, etc., envelope texts, and re-typed items were not included.

8.1.15. Typed papers

The typing of stencils, a relatively small item, was included in this category.

8.1.16. Forms were measured as page items because of the difficulty of otherwise quantifying them; for example, four full lines of typed opinion on a form might take less typing time than the correct placement, on a proforma, of four single items, each of two or three digits. Hence the secretary often chose to write, rather than type, results on certain forms. It should be noted that the time for the category "Forms" is excluded from "Typing Time", and included in "Laboratory Reports" (para. 8.1.7.).

* see "How Many Secretaries?", footnote to bar-chart in paragraph 5.2.

8.2. Work load

ITEM	TOTALS AND PERCENTAGES							
	Week 1.		Week 2.		Week 3.		Totals (for 3 weeks)	
	Total (mins)	%	Total (mins)	%	Total (mins)	%	Totals	%
1. Telephone Enquiries (In-Out)	35	1.8	75	3.9	60	3.1	170	2.9
2. Tracing Records	30	1.5	-	-	60	3.1	90	1.5
3. Appointments	40	2.0	105	5.4	15	0.8	160	2.7
4. Form Documentation	270	13.8	225	11.5	-	-	495	8.5
5. Patient Reception	65	3.3	45	2.3	10	0.5	120	2.0
6. Filing	100	5.1	55	2.8	-	-	155	2.6
7. Laboratory Reports	125	6.4	110	5.7	40	2.0	275	4.7
8. Shorthand Dictation	100	5.1	60	3.1	95	4.9	255	4.4
9. Messenger Duties	60	3.1	90	4.6	135	6.9	285	4.9
10. Unoccupied Time	430	22.0	765	39.2	715	36.7	1910	32.6
11. Miscellaneous Duties	-	-	35	1.8	150	7.7	185	3.2
Weekly Totals	1255	64.1	1565	80.3	1280	65.7	4100	70.0
Typing Time	700	35.9	385	19.7	670	34.3	1755	30.0
Letters/Lines	6/44		4/15		26/78		36/137	
Papers/Lines	1/ *		1/66		3/261		5/327	
Forms (page-items)	73		133		75		281	

* = line count not recorded for one paper

9. DISCUSSION

9.1. Document procedure

9.1.1. It is obvious that the present clerical procedures are unnecessarily complicated and time-consuming, and that what is required is a complete redesigning of all forms and procedures by the staff of the Department in collaboration with work study experts and typographers.

9.1.2. We have already initiated discussions between the staff of the Department and Mr. Roy Foster of the Department of Industrial Administration, University of Strathclyde, to redesign the documents connected with the routine I-131 tests, and, fortunately, the Department has newly begun to use a desk electronic computer for laboratory calculations, which will itself simplify form procedure.

9.1.3. Where documents need not be redesigned, they should, if possible, be pre-printed (by stencil or otherwise) and carbon copies used. The present method of completely handwriting each form for the iron utilisation and the chromium tests is ridiculous.

9.2. The need for a secretary

9.2.1. The figures for the trial secretary show that she was employed for only two-thirds of her time.

9.2.2. Document procedure changes will result in further savings, particularly as regards appointments and form documentation, and we suggest that, in addition, the Department should utilise the mechanical documentation facilities now being introduced into the rest of the Infirmary, so that all documents and specimen containers will be identified with pre-printed labels.

9.2.3. The provision of tape recorders for dictation and transcription would largely eliminate the time required for shorthand dictation.

9.2.4. All this would result in a Department secretary being employed for considerably less than two-thirds of her time.

9.2.5. Employing her on a part-time basis would, however, be unsatisfactory, because the very diversity of her duties would demand her full-time presence.

- 9.2.6. We suggest, therefore, that, in addition to the duties described, she assume responsibility for:-
- (a) the Scan Meetings of the Department of Medicine *,
 - (b) the completion and despatch of all laboratory reports from the Gardiner Institute in addition to those connected with the Radio-Isotopes Department,
 - (c) typing some of the papers for publication for staff of the Department of Medicine who are not concerned with the Radio-Isotopes Department,
 - (d) assisting Miss Davidson with her data processing work /.

9.2.7. She must, however, be provided with suitable office accommodation, furniture and telephone facilities, such as we recommended for the other secretaries in the Department of Medicine √.

* See "How Many Secretaries?", para. 5.5.1.4.

/ See *ibid.*, para. 5.6.1.1.

√ See *ibid.*, paras. 6.2.5., 6.2.7., and 7.2.

10. RECOMMENDATIONS

- 10.1. Document procedure in the Department should be revised in the light of discussions recently begun between the staff and experts from the University of Strathclyde.
- 10.2. The Department should use pre-printed labels to identify all documents and containers, as soon as the mechanical documentation service is functioning elsewhere in the Infirmary.
- 10.3. A Department secretary should be employed on a full-time basis.
- 10.4. She should be provided with adequate office facilities, as outlined in our Paper "How Many Secretaries?".
- 10.5. Sufficient tape recorders should be available in the Department to eliminate the need for shorthand dictation.
- 10.6. So that her time may be fully occupied, the secretary should, in addition to her Departmental work, act as secretary to the other laboratories in the Gardiner Institute, organise the Scan Meetings, help type papers for publication for all staff in the Department of Medicine, and help Miss Davidson with her data processing work.
- 10.7. Miss Davidson should become familiar with all aspects of Departmental work, so that she can replace the Departmental secretary during her absences on holidays and from sickness.

11. SUMMARY

- 11.1. An investigation into the clerical procedures of the Radio-Isotopes Department of the Western Infirmary, Glasgow, is described.
- 11.2. Recommendations are made for improving the present unsatisfactory document procedure.
- 11.3. The need for a Departmental secretary is outlined and a scheme for her duties is described.

12. ACKNOWLEDGEMENTS

I wish to thank all the staff of the Radio-Isotopes Department for their coöperation during this investigation; Mr. Roy Foster, Lecturer in the Department of Industrial Administration, University of Strathclyde, for his invaluable advice on form design; and Mr. Ian Laing, Miss Emmeline Thorpe, and Miss Margaret Clarke, who, as members of my own staff, planned and took part in the trial secretary procedure.

CHAPTER EIGHT

R E C O R D S O F D R U G T R E A T M E N T

"Nurses and pharmacists are by nature and calling uncomplaining people who soldier on, earning administrative praise for splendid efforts in impossible situations. Their efforts are not rewarded by or a justification of a laissez-faire policy"

(Vere, 1967).

" 'This may cause drowsiness. If affected, do not drive or operate machinery' - warning on the label of a bottle containing linctus for children between the ages of one and ten."

(Peterborough, 1968).

Present Trends

"How many doctors", ask Crooks et al. (1967b) "have ever accompanied a nurse on a medicine round?" Most of us seem to believe that having ordered drug treatment, either verbally or in writing, for one of our ward patients, it is always given thereafter accurately and promptly by nursing staff. Detailed enquiry reveals a very different and alarming picture.

Mrs. XA, a middle-aged housewife, was admitted to hospital one Saturday morning because her long-standing rheumatoid disease had relapsed acutely in spite of powerful drug therapy. The consultant physician saw her on the ward round on Monday

morning for the first time since his domiciliary visit the previous Friday, and remarked that she seemed to have improved, as her chart showed that her temperature had been normal since admission: presumably the drug therapy was now effective. Some days later she confessed she had been too taken aback to tell him that, since admission, she had had no drug therapy whatsoever, nor had her temperature ever been taken.

Mr. XB, an elderly patient recovering from a myocardial infarction, developed acute thrombophlebitis in the deep veins of one calf. A course of oral phenindione was begun, supplemented by initial cover with intramuscular heparin. On the second evening of this therapy the medical registrar, talking to the staff nurse in the ward, suddenly realised that she had given a dose of 62,500 U of heparin the previous night instead of 12,500 U ; this had happened because she had selected the wrong multidose bottle from the cupboard shelf, and had not read the label carefully. Fortunately, the patient suffered no harm except a small haematoma.

Mrs. XC, a registered nurse, was convalescing in a medical ward after a neurosurgical operation. Early one morning the night nurses decided to give out the pre-breakfast medications to save the day staff work. When the day nurses came on duty the medicine round proceeded as usual, and Mrs. XC was prevailed upon, under protest, to accept a second dose of

chlorpromazine. She was later able to help them, however, by suggesting why the usually-stable diabetic patient in the opposite bed had developed acute hypoglycaemia.

Until now, in these chapters, I have not mentioned kindness, as one assumes this virtue in dedicated professional staff. Nowadays, however, when time and tempers are short and work exhausting, much of the grace and dignity in life have been brushed aside, and to a sick person brusqueness and impatience are always unkind and sometimes cruel; perhaps, looking back in time, this is where our hospitals have deteriorated most. The role of sympathy is emphasised in print and too seldom practised (Browne and Freeling, 1967).

Cohen (1964) illustrates this point in a chilling little story of petty cruelty:

"The nervous lady underwent a unique operation, performed by an ear specialist whose name no one thought fit to tell her. The night following her operation, having been extremely sick, she begged the day-nurse for a sedative. 'Ask night staff, will you? They see to sedatives!' When night staff came on duty, she repeated the request. 'Oh, we can't give drugs without Sister knowing - and Sister's gone already.' 'Lights Out' plunged the ward into uneasy silence. I could hear the Ear Case sniffing miserably. Suddenly, an enormous woman in blue uniform flashed a torch in my face, muttering, 'Yes or

No, Mrs. er--?' 'Yes or no what?' 'Bowels open?', she pursued impatiently. 'No'. She thrust a pill at me and went on to the Ear Case, who whispered, 'Might I possibly have a sedative, nurse?' The torch wavered and shook in anger. 'Who do you think prescribes the treatment here? Us or the patients? Answer me!' There was no answer. Everyone lay awake, listening to the muted sobs of this heretic whose ear had appeared in the Lancet."

Such incidents, though not condoned, are usually explained as being due to overwork, and the lack of adequate numbers of fully trained staff. There is a danger, however, of attempting to meet the shortage of State Registered Nurses by introducing into the profession members with lesser training. The status of State Enrolled Nurse has been in existence for some years, and, in some respects, serves a useful purpose, but the process has gone further. Large numbers of Nursing Auxiliaries now swell the ward staffs of many hospitals and they are usually untrained; it is but one step more to consider these individuals as semi-skilled.

The dividing line was crossed boldly in one hospital years ago where Nursing Auxiliaries were known as Auxiliary Nurses, addressed as "Nurse", and left in full charge of wards for many hours at a time, during which they were responsible for the administration of all oral medication (Mitchell, 1963).

A radical change of attitude is urgently needed. At one time drug therapy was a small, and relatively unimportant supplement to general nursing care; today, of course, the reverse applies in many instances. Nurses are adequately trained neither in pharmacy nor in pharmacology to bear their present responsibilities, nor are most pharmacists sufficiently familiar with modern therapeutics to be useful members of a clinical team.

We must examine in detail the traditional methods of drug prescribing, administration and stock control in hospital wards, to properly define the faults in the systems, before we can even begin to advise useful changes, and this is yet another instance where records must be considered in relation to the whole work routine.

Explanation of Terms

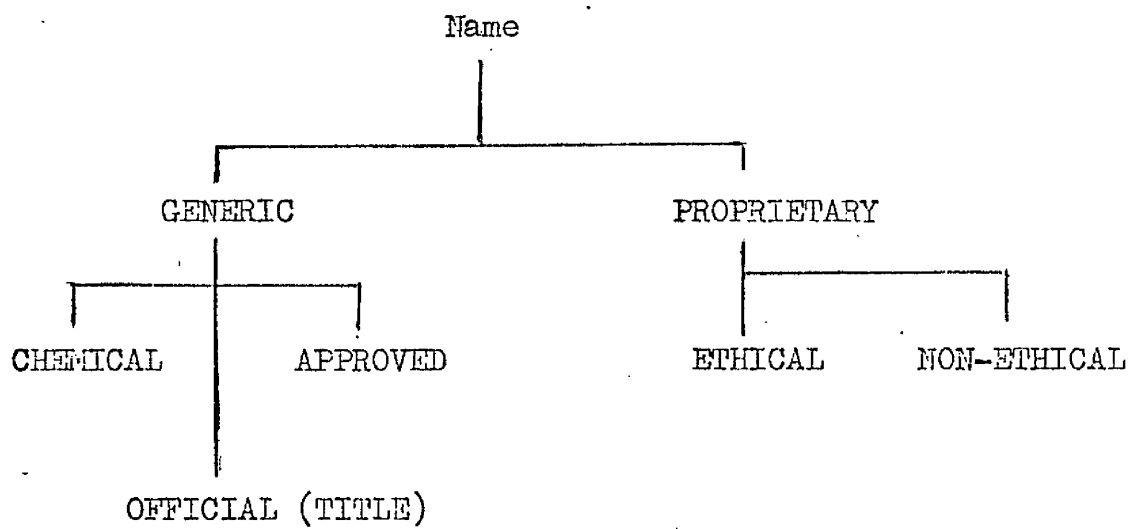
Drug Nomenclature.

The basic system is indicated in Figure 8/1, and the various terms may be explained as follows :-

A generic name is not protected by commercial patent, as opposed to a proprietary name, which is a trade mark. An Official Title is used for a drug preparation which features in the British Pharmacopoeia, the British Pharmaceutical Codex or the British National Formulary. The preparation may consist

FIGURE 8/1.

DRUG NOMENCLATURE



of one or more drugs, and, in the latter case, the name should be written with capital first letters, and followed by the initials B.P., B.P.C., or B.N.F. This is not necessary with single-substance drugs, unless to indicate standards of purity, or some other specification of the samples, such as particle size, and their names, if unaccompanied by the suffix initials, should be written without capital letters. So should all Approved and chemical names, although medical secretaries are frequently taught to the contrary.

An Approved Name is one which has been selected for a single-substance drug by the British Pharmacopoeia Commission, in case it is later chosen for inclusion in the British Pharmacopoeia. Nevertheless, the eventual Official Title may be quite different from an existing Approved Name. Approved Names are published from time to time in a list obtainable from the Secretary of the British Pharmacopoeia Commission, G.M.C. Office, 44 Hallam Street, London, W.1.

A proprietary name should properly be written in inverted commas and with a capital first letter. Only so-called ethical preparations are available on prescription to N.H.S. patients, they being those not advertised to the British general public. For example, "Alka-Seltzer", an excellent formulation of buffered aspirin, is not supplied by the N.H.S. because it is in the "non-ethical" category. The line of distinction is,

however, blurred in certain circumstances: "Dettol", for instance, is both supplied by name in hospitals, and publicly advertised.

Most ethical preparations currently available in the United Kingdom are listed in MIMS, the Monthly Index of Medical Specialities published by Medical Publications, Ltd.; copies are obtainable from the Medical Mailing Company, Ltd., The Mailing House, Ealing, London, W.13.

Work Symbols.

- = operation (in the work study, not surgical sense).
- C = clerical
- ▽ = storage
- T = temporary
- ↓ = transport
- = inspection

The Prescribing and Administration of Drugs in Wards: the Traditional System.

1. (C) A clinician orders drug treatment for one of his patients, by issuing verbal instructions to a nurse; he may also record details in the case notes.

Comment :-

(a) The written instructions may be inaccessible for reference. If they are entered in sequence with progress notes, they will not be readily noticed or found thereafter, and it is likely that the treatment will either never be started, or will be given inaccurately in terms of drug and/or dose-quantity and/or dose-time. Furthermore, treatment, once started, is likely to be continued overlong, either because the clinician has forgotten it is still being given, or because the nurses have forgotten his instructions to stop it. All these risks may be minimised by using a separate treatment chart with horizontal guide lines, and with separate columns for dates of starting and dates of stopping.

(b) The written instructions may be illegible to nurses or to other clinicians. This very common risk (Fogg, 1965) may be minimised by drug names being printed in block letters on treatment charts.

(c) The drug ordered may be stocked in the ward cupboard, but labelled with a synonym (generic or proprietary) and this may not be apparent to the nursing staff. Four common examples will suffice to illustrate this point :-

- (i) Nitroglycerin is the same as glyceryl trinitrate which is the same as trinitrin.
- (ii) "Soneryl" is a proprietary preparation of butobarbitone.
- (iii) "Rimifon" and "Pycazide" are proprietary preparations

of isoniazid, alias iso-nicotinic acid hydrazide,
alias I.N.A.H.

- (iv) "Dindevan" is a proprietary preparation of
phenindione, alias phenylindanedione.

Apart from creating confusion about the treatment of individual patients, diverse nomenclature tends to result in ward drug cupboards being overstocked with differently labelled, but otherwise essentially similar preparations. This can be partly offset by each ward being regularly supplied with copies of G.M.C. lists of Approved Names and MIMS.

(d) The written instructions may be ambiguous or simply vague. One such as "phenobarbitone, one tablet" is dangerous because various tablet strengths of the drug are commonly available. Terms like "as necessary" may encourage a nurse to use her discretion beyond the limit of her ability to accurately assess a situation. Abbreviations may be misapplied by the clinician or misread by the nurse; e.g. S.O.S. and P.R.N. are not synonymous (the first meaning "once only if necessary", the latter meaning "whenever necessary"), but are so often assumed to be so that it might be safer that neither be used.

Similarly, Q.I.D. is (usually) correctly read as "four times a day", but this is not necessarily translated as meaning

"approximately every six hours"; on the contrary, nurses often assume complete discretion in their interpretation of the term and the drug may actually be given to the patient four times during waking hours, some of these times being separated from one another by quite short intervals (e.g. 6 a.m., 10 a.m., 2 p.m. and 6 p.m.) simply because other drugs are given to other patients at these regular times.

The doses written by the clinician may confuse the nurse who cannot understand the old-fashioned apothecaries' symbols (\mathfrak{z} = dram, and \mathfrak{z} = oz.), or appreciate that the correct* abbreviation for gram(s) is "G", for milligram(s) "mg." and for grain(s) "gr.", and that the abbreviation "gm." is ambiguous. Certainly Roman numerals and apothecaries' symbols should be completely abandoned, and, especially if the metric system is not totally adopted, the proper abbreviations should be consistently used and understood.

2. $\textcircled{\text{C}}$ A nurse records the details of treatment, newly ordered, on a medicine list, or in one of various notebooks.

3. ∇ She puts these documents aside until she or her colleagues need to refer to them later.


Comment :-


(a) The dangers of transcription errors occurring at this point are being continually stressed (Baker, 1967;

* "correct" in pharmaceutical practice, though, not of course, in physics or chemistry.


Crooks et al., 1967b; Ross, 1966; Vere, 1967), but remain insufficiently appreciated. They are particularly likely to occur in hospitals where nurses are still in the habit of routinely making up a new medicine list each day by altering and adding to the old one and copying it out afresh.

(b) Special medication books are likely to be mislaid when most wanted, and they suffer from the great disadvantage that block entries are made daily, which means that a patient's treatment with laxatives, sedatives, etc., over a period of time cannot be seen at a glance on one sheet of paper, but must be traced back laboriously on page after page. Fragmentation of information in this way is highly prejudicial to efficient patient-management at any level, and the books should be totally abandoned, together with their companion volumes relating to bathing details, scalp inspections and so on. The information should be recorded and stored in a loose-leaf system, each page relating to one patient only. Drug treatment and other information about a patient are not necessarily best kept on the same single sheet, however, as I shall later show.

4.  When treatment is due, i.e. usually at a "medicine round", a nurse takes the treatment documents to the drug cupboard.

5.  She searches for and removes the appropriate

containers, and measures out the necessary doses.


6.  She takes the dose(s) to the patient.

Comment :-

(a) She may have trouble finding the drugs in the cupboard. I shall develop this point later when discussing stock control.

(b) Transporting separate doses to separate patients is time-consuming and calls for care, dexterity, and patience. On a medicine round the nurse will be tempted to streamline the work by either transporting documents and containers en masse to different patients before measuring out doses, or by carrying a trayful of measured doses to several patients. In the latter case, especially, the right patient may be given the wrong drug, or have a drug omitted in error.

Some type of drug trolley is a logical way of overcoming this difficulty, particularly as there is evidence (Vere, 1965) that the administration error rate rises with the number of drugs a patient is prescribed.

7.  The nurse gives the patient the dose(s).

Comment :-

(a) No record is made of the actual administration of the dose (which drug and by whom).

(b) This is particularly unfortunate when the patient cannot be given the dose at the correct moment in time - he

may, for example, be in the bath, or in the X-Ray department. The dose may then be given some time later, if someone remembers; worse still, one dose too many may be given to a non-communicative patient, because two conscientious nurses act independently of each other.

(c) The right dose of the right drug may be given to the wrong patient. This may be because the new nurse in the ward does not trouble to ask the patient his name (she assumes she knows it correctly); or because the patient's bed has been moved from one part of the ward to another, but someone else's charts still lie on the bedside locker; or because name labels on the wall at the bed head were not changed when the bed was moved; or even because the patient is now in another bed and the label on the bed has not been changed.

These dangers emphasise the need for a record to be kept with details of the administration of each dose of each drug, and the need for each patient to have a personal name label affixed to his body, a point I have stressed in a previous chapter. From my own experience I know that insulin injections are quite often given to the wrong patient in a hospital ward: here there are two serious errors, one of commission and one of omission.

Summary.

In the system described there are two sets of records.

On the one hand, the case notes of the patient may include details of medication prescribed; on the other, all or some of the same information is noted in separate medicine lists and perhaps also in special-purpose notebooks. These latter documents are created and maintained by nursing staff, cannot by their very design be subsequently incorporated in the unit files of patients, and contain no note of whether individual doses of the drugs in question have actually been administered.

A lot of clerical work is involved in maintaining this system of records, quite out of proportion to the accuracy achieved and the return of information obtained - in short, the system is a very bad one.

Stock Control of Ward Drugs:

the Traditional System

1. ☐ A senior nurse inspects the drugs in the ward cupboard(s) and decides what items should be ordered.

Comment :-

(a) It may surprise the reader to learn that very frequently drugs are housed in ward cupboards that do not comply with legal requirements.* In one instance, for example, (Mitchell, 1963) Dangerous Drugs (narcotics, etc.) were housed,

* Rules governing the storage of drugs in hospital are included in the Pharmacy & Poisons Act, 1933; the Drugs (Prevention of Misuse) Act, 1964; and the Dangerous Drugs Act, 1965 (Forbes, 1967).

with all the rest, in a glass-fronted cabinet, the door of which had two separate locks. This was a gross misinterpretation of the legal requirement that such drugs should be stored in a locked cupboard, within another locked cupboard.

(b) Drug cupboards in wards are usually untidy because they are not custom-built, because they are too small, and because the containers they house vary so much in size and shape, and in the positions of their labels.


(c) The inscriptions on the labels of the drug containers may be unsatisfactory because they are synonyms (a point I have already discussed), because they are illegible, because they do not sufficiently indicate what are Poisons and Dangerous Drugs (both terms I use in the legal sense), because they do not indicate the strengths of tablets, solutions, ointments, etc., or because they do not indicate the expiry dates or critical storage temperatures of the preparations. Storage temperatures are too often assumed to be "all right", even in extreme cases of planning stupidity where drug cupboards are specially built in treatment rooms with ambient temperatures constantly above 75°F. (Mitchell, 1963).

2. (C) The nurse writes out an indent specifying the drugs required from the pharmacy department.

Comment :-

(a) A lot of writing is necessary.


(b) The nurse, being no pharmacist, frequently misspells names, omits strengths and asks for non-standard quantities. These factors could be overcome by the use of proformae whenever possible.

3.  The nurse arranges for the indent, and empty containers to be sent to the pharmacy department.

Comment :-

(a) Transport problems may arise as described in a previous chapter.

(b) If only one container is available for a particular drug, and it is to be returned to the pharmacy department to be filled, the nurse will follow the time-hallowed, and highly dangerous routine of emptying the remainder of the old stock from the container into some unlabelled or improperly labelled receptacle for temporary storage. The potential consequences are obvious, and suggest the need for storing in the ward cupboard at least two containers for each commonly used drug.

4.  A nurse receives the supply of drugs back from the pharmacy department, and checks from an indent copy that everything has been sent correctly.


Comment :-

(a) Some pharmacy departments have a habit of sending less of an item than the quantity ordered, or of sending none

at all, and, at the same time, of offering no explanation or comment unless subsequently asked to do so. In one hospital ward (Mitchell, 1963) the daily drug supplies arrived at 12.25 p.m., and the pharmacy department closed for lunch from 12.30 p.m. until 2.00 p.m. This meant that enquiries about supply discrepancies almost always had to be postponed for at least $1\frac{1}{2}$ hours.

(b) Pharmacy staffs vary greatly in how well they keep note of drug orders still outstanding. Too often this means doctors and nurses must repeatedly remind them that a particular item is supposed to be still pending.

(c) As a result, nurses tend to over-order and over-stock drugs.

5.  The nurse places the new supplies in the drug cupboard(s).

Summary.

In this system there is one set of records, the drug indents. They involve much writing and are poorly completed by nursing staff, and they are often not complied with by the pharmacy staff. The whole question has been carefully reviewed by Baker (1967), who writes (apropos the Westminster Hospital, London), "It was concluded that a lack of confidence existed

in the pharmacy department, and that this could only be rectified by making requisitioning easier and more accurate, and by making drugs more readily available under stricter pharmaceutical control. There was a definite need for uniformity of packs with clearly printed labels using standard nomenclature including batch or expiry dates."

Planning New Systems

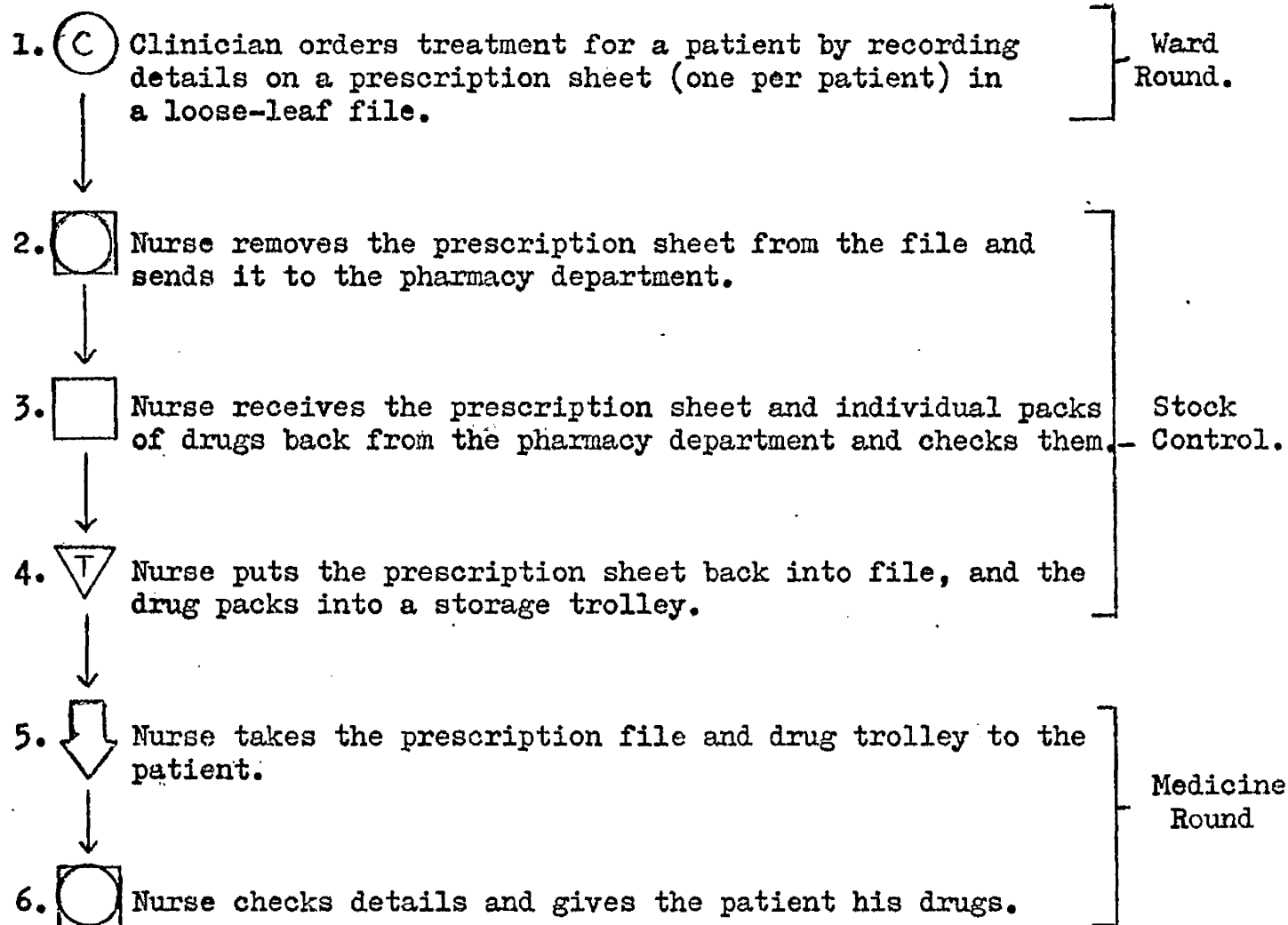
The traditional systems of drug prescribing and administration on the one hand, and the stock control of ward drugs on the other have recently become so obviously unsatisfactory that modifications have been introduced in many hospitals. Unfortunately each modification has been directed towards a specific aspect of the work routine, and there have been few attempts as yet to attack all the faults simultaneously.

Medicine lists in wards were strongly criticised in a report by the Central Health Services Council in 1958. Since then, in more and more hospitals, nurses' notes about patients have been mounted in loose-leaf files (one or more pages per individual patient), and have included individual treatment cards, which replace the traditional medicine lists. Nevertheless, the dangers remain of transcription errors and misinterpretation of intent, and access by the clinician to written details of the treatment he himself ordered is still inconvenient, unless he deliberately keeps a parallel record

in each unit file. A patient's progress cannot properly be reviewed by scrutinising the medical case notes in the absence of a treatment record.

To be able to critically assess various new procedures which have been advocated of late, the reader must remember that, in English hospitals, patients' drugs are frequently packed and labelled as individual personal items, and only some of the ward supplies stored in stock bottles. Furthermore, out-patients are commonly given prescriptions which they can take to the hospital pharmacy department to be dispensed. In Scotland, on the other hand, all ward drugs are almost invariably ordered and stored in stock bottles, and prescriptions and a dispensing service are seldom provided for out-patients.

Some hospital staff in England believe that there are great advantages in the supply of personal medicine packs to in-patients, and if this premise is accepted, there would seem to be everything to be said for altering the traditional work routines to the system shown in Figure 8/2. Here we have one continuous flow-line for drug prescribing, stock control and administration, involving, moreover, the supply of all drugs in personal packs, which are stored in a special trolley with many drawers, one for each patient. This trolley can be wheeled to each patient in turn, and chained to a wall when not in use, to prevent its being removed in toto by an

FIGURE 8/2.WARD DRUGS: A TENTATIVE REVISION OF ROUTINES OF PRESCRIBING,
ADMINISTRATION AND STOCK CONTROL.

unauthorised person.

Such a system is already in operation in Manchester (Ross, 1966; Ross, 1967). The preparation of drugs for individual patients is claimed to be more accurate, being mainly in the hands of a pharmacist instead of a nurse, and random counts of individual drug containers can give a measure of the efficiency of the actual administration of drugs by nursing staff.

Though attractive at first glance, this system is not, in practice, as efficient and fool-proof as might be expected. In the first place, a prescription sheet must often be absent from the ward, which is thoroughly undesirable, in spite of the somewhat lofty views to the contrary of the Guild of Public Pharmacists (1965). The clumsy new set of documents recommended in the Tunbridge Report (1965) to overcome this specific difficulty may be summarily condemned, if only because of the marked increase in clerical work they would cause. There is no suitable answer here except to acknowledge that a prescription sheet cannot satisfactorily act as both a treatment chart and a drug supply indent.

Baker (1967) sums it up very neatly by remarking, "Even when the pharmacist can ensure that the prescription is available for main medicine rounds on the wards, its absence at other times can cause difficulty, and can lead to error. Not all

drugs are administered at standard times and the doctor may at any time want to review the patient's treatment. In the absence of the prescription he may be less inclined to wait for its return than to start using a second prescription; in either case confusion and error can occur."

The second serious criticism is that the drug trolley will not accommodate large bottles, and, furthermore, 31% of the total supply of drugs to wards still consists of stock items of internal medication, including mild analgesics, antacids, laxatives, sedatives and cough preparations. Thirdly, because other stock items are no longer immediately available at all times, the hospital emergency cupboard is used twice as often as before (Ross, 1967). It would seem, therefore, that this new system creates as many problems as it solves, and it certainly provides no evidence, other than circumstantial, that a particular dose of a particular drug has actually been administered to a patient. Moreover, one must remember that the risk of error by a pharmacist is actually greater when he dispenses individual packs on an ad hoc basis than when he prepacks stock items from bulk supplies (Baker, 1967).

Which brings us, as the Americans say, right back to square one, apart from the thought that ward drugs might usefully be stored in a trolley rather than a cupboard. It must not be assumed from my remarks, however, that I think

there is no satisfactory solution to this very complex problem. On the contrary, I am most impressed by certain new procedures in two different hospitals, and I think they could be combined into a system which would solve all the difficulties I have so far described.

The Westminster Pharmaceutical Service

Mr. J. A. Baker, Group Chief Pharmacist in the Westminster Hospital, London, has recently applied work study principles to radically revise the procedures in his department, and ensure much closer coöperation between doctors, nurses and pharmacists in the provision of drug treatment to patients (Baker, 1967).

The Supply of Stock Drugs.

All wards in the hospital are supplied with certain drugs as stock items, because, statistically, they are the ones used most often. In addition, the wards of various specialties are supplied with various supplementary stock items for the same reason. The relevant statistics are reviewed at regular intervals so that these stock lists may be revised if necessary. Drugs not on the stock lists are dispensed on an ad hoc basis for individual patients, and labelled accordingly.

Stock items are prepared in unit packs in the pharmacy department. Full records are kept, and procedures are documented so that they can be carried out by technicians working under supervision. Containers are of standard shape and size, which makes for economy of space in ward cupboards, and the labels of both stock and non-stock items are affixed to the narrow faces of bottles (except in the case of non-internal liquids, which are packed in oval containers). Labels for stock items are printed, clearly marked "stock", and are of uniform size, shape, and design. They all carry batch numbers or expiry dates. At least two packs of each stock item (except hypnotics) are stored in each ward cupboard.

Copies of the general and supplementary list are displayed in each ward inside the drug cupboard and inside the book of indent forms. The 120 items on the general stock list form 90% of all requirements, and are ordered by nursing staff on a preprinted check list on each indent form. Supplementary stock items are ordered separately on another part of the same form. Nomenclature of stock items is standardised: generic names are used in the case of single-substance drugs, otherwise proprietary names if necessary.

Bulky preparations, including intravenous fluids and disinfectants, are topped-up daily on a special round by porters. This reduces ordering by nurses, and makes for less

bulk and less weight in loads of stock items delivered to the wards. All disinfectants are issued at user strength with directions on the labels.

The pharmacy department is staffed until 8 p.m. on weekdays and 1 p.m. on Saturdays. At other times medical staff can help themselves to whatever emergency supplies they need, and this is facilitated by the department being fully indexed. In addition, in every ward there is a standard box of emergency drugs; whenever an item from it is used, the whole box is exchanged by the pharmacy department for a new one. On each floor of the hospital there is another box of special drugs stored with cardiac resuscitation equipment.

This system overcomes many of the particular difficulties I described previously. Packing of drugs in the pharmacy department, and their supply to the wards has been admirably streamlined, and clerical work for the nurses minimised by the use of preprinted indents for stock items. Most impressive of all, the bottles on a shelf in a ward drug cupboard are now arranged as neatly as a row of books, and their labels are clearly displayed outwards to be read at a glance. The supply of non-stock items to wards will be described later.

The Prescription Sheet.

Each in-patient has a treatment record, known as a "prescription sheet", clipped to the end of his bed. This

document (Figure 8/3) is a stiff card printed on both sides. One side is for recording information about drug therapy in the ward, the other for details about diet in the ward, and about drugs to be taken after discharge from the ward; the latter side also includes a metric conversion chart and instructions on how drug prescriptions on the sheet should be written.

In the section for ward prescriptions there are horizontal guide lines for 23 entries. The first vertical column is for the date medication is started, the second for the pharmacist's use (see later), and the third for the name of the drug. Doctors are asked to use Approved Names whenever possible, and to print rather than write names. Next are columns for the dose, which should always be in metric units, for the route of administration, which should always be specified, and for the times of administration. Columns are drawn for specific times but if these are inappropriate the prescriber writes his own directions across the spaces. The final two columns are for the prescriber's signature and the date of cessation of treatment; when the latter entry is made, a horizontal line is also drawn across the whole entry to make its cancellation even more obvious.

Certain therapy may, of course, be detailed elsewhere, for example on a fluid balance chart, but a brief entry should

FIGURE 8/3.

WESTMINSTER PRESCRIPTION SHEET.

The two sides of this document are shown
on the following two pages.

PRESCRIPTION SHEET

[illegible]

be made on the prescription sheet for cross-reference, and for the pharmacist's information (see later). Drug sensitivities are noted in red in a special panel. When the last line has been filled a new sheet is begun by transferring to it details of any current therapy.

To help ensure the completion of the prescription sheets in this manner each ward has been supplied with lists of Approved Names, metric conversion charts, and metric measures; Imperial measures have been withdrawn.

Pharmacists Visiting Wards.

Now that the preparation and distribution of drugs is done so much by non-qualified staff (technicians and pharmacy students), qualified pharmacists have time to personally visit all wards. Each pharmacist is responsible for six or seven wards (totalling about 150 beds), which he visits every morning and afternoon. Prescription sheets with new entries are left together for him by the nursing staff, and he inspects each in turn to see that the prescriptions are complete and logical. If he doubts the latter, he consults with the prescriber to make sure that what was written was actually intended (e.g. two drugs may be incompatible, or a dose may seem unduly high, or a concentration or a dose may not be easily dispensed).

In any event, the pharmacist amends the drug name on the

prescription sheet if the item is a stock one and is listed synonymously, and he amends the dose if it is not already in metric units. He enters "S" in the second column on the prescription sheet when a drug is a stock item for that ward: he can easily check this information from his portable file of ward stock lists and medicine labels. When a prescribed drug is a non-stock item he writes out a label there and then, filling in sufficient details to allow his department to dispense the medicine in an individual personal pack for that patient; at the same time he initials and dates the entry on the prescription sheet (again in the second column). When he returns to the pharmacy department he files the completed labels in a special box and the items are rapidly dispensed and sent back to the wards.

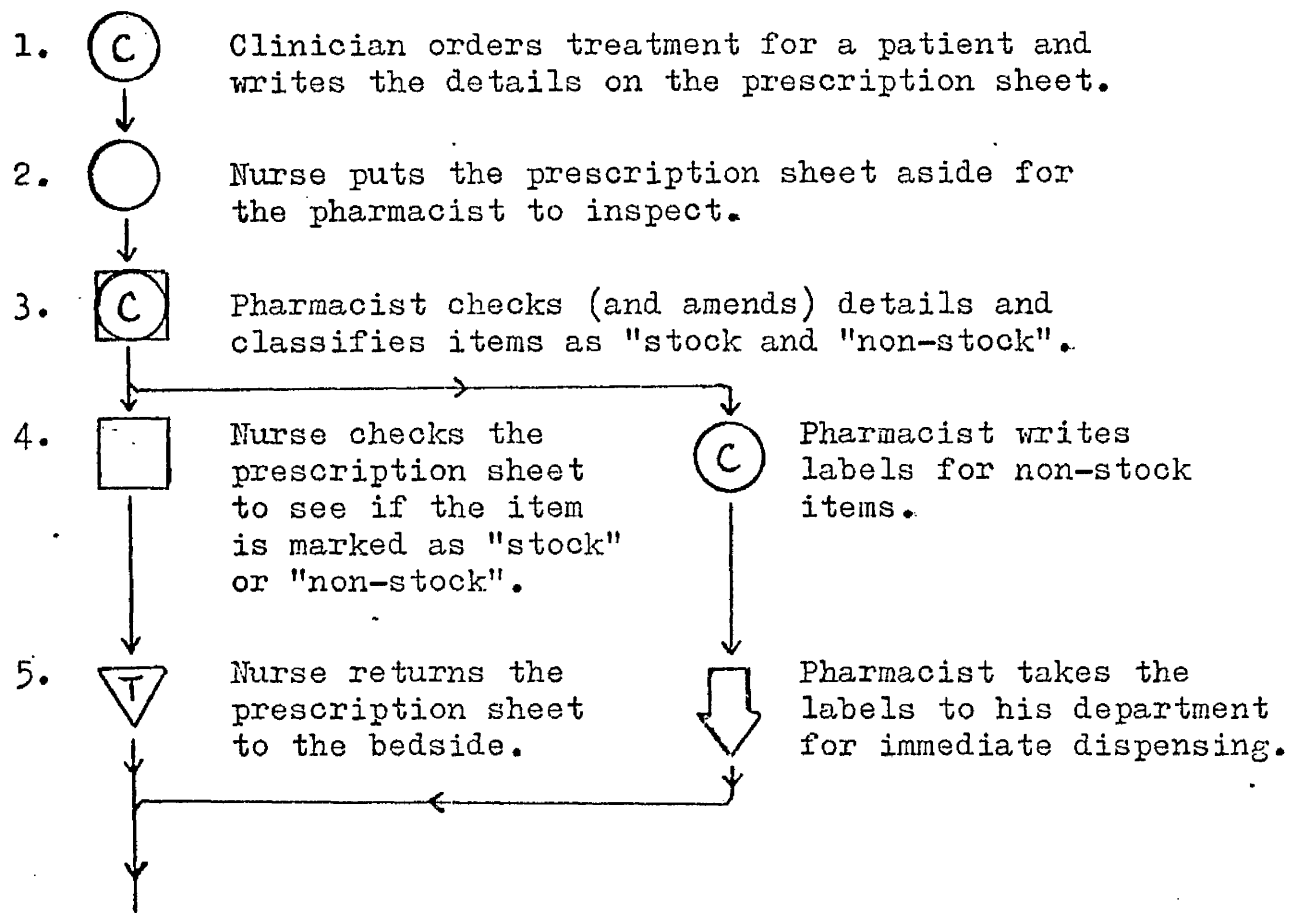
Prescriptions for all antibiotic therapy automatically lapse after one week, and those for non-stock items (except antibiotics) after one month. The visiting pharmacist will attach appropriate signal labels to a prescription sheet in such circumstances to remind doctors to re-prescribe the items if they wish. Normally one weeks' supply is dispensed of a non-stock item at any one time. Repeat supplies are provided by the pharmacy department up to one month after the writing of the original prescription, on receipt of a signed order form from a registered nurse, and the original container.




In the case of tablets the actual dispensing is greatly speeded by the use of a 6 to 1 weighing balance.

A pharmacist visiting wards is involved for about one hour per day per 150 beds, which cannot be said to be excessive. His main responsibilities are always in the pharmacy department, and he himself is always a senior member of staff. It is claimed that the visits to the wards "could be maintained even in times of acute pharmacist shortage although other services would have to be reduced" (Baker, 1967).

Summary: Drug Prescribing and Administration

This can be charted as follows :-



- JUN
6.  Nurse receives and checks non-stock items from the pharmacy department and stores them in the drug cupboard.
7.  Nurse takes the drug doses to the patient at appropriate times.
8.  Nurse records the administration of each dose on a special sheet.

It will be apparent that many difficulties have been overcome, and clerical procedures reduced by the pharmacist travelling to the prescription sheet instead of vice versa, and this also facilitates person-to-person discussion should there be any details in the prescription which require clarification. The main objection to a scheme such as this is that pharmacists might offer advice in such a way that they would be accused of teaching doctors how to practise medicine. However, if inter-professional relationships are begun on a proper basis there is little reason why they should not so continue; if doctors and nurses can usually work together in harmony, a cordial tripartite arrangement which includes qualified pharmacists should also be possible. Once a pharmacist is brought into the environment of a busy ward he will be much less tempted to be either dilatory or pontifical.

The reader may have noted the vague way in which I described the last two steps in the flow-line. This is because staff at the Westminster Hospital already appreciate the

advantages of mobile drug storage and are planning its introduction. They feel that keeping the prescription sheet at the bedside increases the accuracy of patient-identification (Baker, 1967), but I have already explained my preference for patient body labels, and I think it most unwise to leave treatment records, which are, after all, confidential, where all and sundry can read them. They would be better housed in a special loose-leaf file, and kept with other records.

I would also criticise some details of the prescription sheet itself. The times "breakfast", "lunch" and "supper" seem to be too vague, and I am uneasy about the pharmacist directly amending the title of a drug written by a clinician. It might be preferable to have an adjoining column for title amendments and the practical result (better or worse) of this altered format would be best assessed by pilot trial. I can foresee the possibility of overprinted amendments being sometimes challenged as inaccurate, presumptuous or even totally unacceptable, and at least the argument could be pursued more profitably if both the original and amended titles were clearly legible.

Nurses at the Westminster Hospital presently write, in longhand, details of each and every dose of a drug they administer. This is very laborious and the particular document is to be changed whenever a satisfactory alternative has

been designed. I would suggest that a drug administration record already in use elsewhere might suit very well, and that its companion prescription sheet might be considered for adoption at the same time. These documents are used in Aberdeen General Hospitals Group.

The Aberdeen Treatment Record

The enquiry into a discrepancy between the prescription and administration of a single drug in Aberdeen in 1964 led to detailed operational research into drug usage in hospitals (Crooks et al., 1967b). A new system was devised by a now-permanent committee in an attempt "to eliminate transcribing errors and minimise errors of omission and commission; to economise on nursing time; and to produce good records." (Pharmaceutical Services Committee, 1967). Two documents are used: a prescription sheet (printed on one side only) and a drug recording sheet, and they are housed in a "Kardex" loose-leaf file in such a way that those for each patient face one another as adjoining pages.

The prescription sheet (Figure 8/4) is printed in colour and is fairly similar to the corresponding Westminster document. Drugs, however, are classified according to whether they are to be given once only or regularly, and whether they are to be

FIGURE 8/4.

ABERDEEN PRESCRIPTION SHEET.

This is shown overleaf. It is printed on one side only.

Aberdeen General Hospitals

PRESCRIPTION SHEET

PARENTERAL DRUGS — REGULAR PRESCRIPTIONS

DATE COMMENCED	DRUG (Block Letters)	DOSE	TIMES OF ADMINISTRATION										METHOD OF ADMIN.	SIGNATURE	DISCONTINUED	
			AM 6	AM 10	AM 12	PM 2	PM 6	PM 10	PM 12	ON	OFF	THRS.			DATE	INIT.
A																
B																
C																
D																
E																

OTHER DRUGS — REGULAR PRESCRIPTIONS

F																
G																
H																
I																
J																
K																
L																
M																

PARENTERAL DRUGS — ONCE ONLY PRESCRIPTIONS

DATE GIVEN	DRUG (Block Letters)	DOSE	TIME OF ADMIN.	METHOD OF ADMIN.	SIGNATURE	GIVEN BY INITIALS	DATE	DETAILS	INIT.
N									
O									
P									
R									
S									
T									

OTHER DRUGS — ONCE ONLY PRESCRIPTIONS

U									
W									
X									
Y									
Z									

APPROXIMATE METRIC AND IMPERIAL EQUIVALENTS

1 Milligram	=	$\frac{1}{160}$ Grain
60 Milligrams	=	1 Grain
1 Gramme	=	15 Grains
30 Grammes	=	1 Ounce
1 Kilogram	=	2½ Pounds
1 Millilitre	=	15 Minims
30 Millilitres	=	1 Fluid Ounce
600 Millilitres	=	1 Pint
1 Litre	=	3½ Fluid Ounces

DRUG SENSITIVITY

CONSULTANT

AGE

UNIT NUMBER

NAME OF PATIENT

G.W. No.

given parenterally or not. There are 8 lines provided for regular non-parenteral items and these, surprisingly, are usually sufficient (Crooks et al., 1967a). No drug whatsoever is administered, save in exceptional circumstances, without a doctor's signed prescription: not even laxatives, mild analgesics or antacids.

Approved Names should be used when possible, and all names should be printed, but no subsequent amendments are made by a pharmacist. Similarly, metric units of dosage should always be specified, and a conversion table is incorporated on every prescription sheet. Columns are preprinted for exact times for regular prescriptions; if these are unsuitable 3 other unheaded time columns are also provided. Traditional pharmaceutical abbreviations are advised against, even to the extent of avoiding "p.c." and writing "after food" in full.

Oxygen therapy is prescribed in the section headed "other drugs", diet is detailed in a special section, and diagnostic agents are recorded under the heading most appropriate. Surprisingly, however, pre-operative and post-operative medication are regarded as best recorded only on the anaesthetic record: I would think that this might tend to separate items of information which should be collated, for example, pethidine might be inadvertently given to a patient having mono-amine

oxidase inhibitors (Godwin, 1968).

When all the lines on a section on the sheet are full a second sheet is started. A signal label is attached to the first sheet to indicate this, and the code letters on the second sheet are prefixed by the figure "2". When a third sheet is necessary its code letters are prefixed accordingly, and all current therapy is brought forward from the other two sheets.

The drug recording sheet (Figure 8/5) is also printed in colour and is completed and initialled by a nurse each time she administers "regular" medication to a patient. She locates the appropriate panel for date and time and writes in each box within that panel the code letter of the drug in question. If the patient is absent when medication is due, the nurse enters the code letter as before and draws a diagonal line through it, and if she gives the missed dose later she makes a fresh entry, using an "other times" column. If a patient refuses to take a dose of a drug, the nurse enters the code letter in the box and draws a circle round it.

In the case of a "once-only" prescription, administration of the dose is recorded on the prescription sheet by the nurse's initials and a horizontal cancelling line through the whole entry. If the patient is absent or refuses to take the drug, the words "absent" or "refused" are written in place of

FIGURE 8/5.

ABERDEEN DRUG RECORDING SHEET.

This is shown overleaf. It has two identical sides.

WARD

NAME:

UNIT

NUMBER

DRUG RECORDING SHEET

IRREGULAR PRESCRIPTIONS

OTHER TIMES

COMMENTS ON DISCREPANCIES

1961

וירא: ו

10 am

12. mcl

2. mm

3

0000

חברת

SMALL REVELLO

Initial

Initial

Initial

Initial

trial

ial

1

Initial

PLEASE ENTER APPROPRIATE CODE FROM PRESCRIPTION SHEET

the nurse's initials. Prescription and drug recording sheets are kept permanently, and integrated later with the appropriate unit files.

Studies are now being made to introduce pharmacists into wards who will take full control of drug supplies and will make up medicine trolleys for the day ahead; the present records may eliminate the need for even a ward Dangerous Drugs Register (Crooks et al., 1967b).

Conclusions

It is abundantly clear that the present haphazard and dangerous methods of prescribing and administering drugs to in-patients in most hospitals should be discontinued, especially when details are not fully recorded. The new procedures in the Westminster Hospital demonstrate how a pharmacy department can be efficiently streamlined and a pharmacist's professional skill fully utilised. In Aberdeen a different approach has resulted in the designing of a succinct yet fully comprehensive therapeutic record.

Why should the two systems not be combined, for they are essentially complementary in any case? Together they could produce an enormous overall increase in the efficiency of drug therapy in hospital.

CHAPTER NINE

THE QUALITY OF RECORDS

"Doctors, it is said, are difficult. This awkwardness is not simply a question of salaries. They are independent and have little respect for authority. They have a tendency to come and go as they please and to resist detailed interference in the way they do their jobs. They are a constant thorn in the side of lay administrators, since there is always an area of judgement where they reserve the right to follow their own standards and their own professional conscience."

(World Medicine, 1967b)

Evaluation

A medical record is an intimate mixture of fact and expert opinion. To a single author its quality presents little or no problem, for he writes precisely what he wants so as to make his own aide-memoire, and if he has a good memory he writes correspondingly little. In these circumstances a record indicates, to some extent, its author's tidiness of mind, and the quality of medical care offered to the patient.

Problems arise when case notes are composed by several authors, and when different sets of notes are integrated into one unit file. Then the records become confidential documents of communication between various people, and their quality is determined by how well they function in this respect. It depends primarily on their order or tidiness, their legibility, their

brevity or succinctness, and their accuracy and completeness. These factors are very difficult to measure objectively, although at least some of them can be assessed in the course of a medical audit, which is defined as "the evaluation of the quality of medical care as reflected in medical records" (Slee, 1965.)

Who Does What

The general public do not know or understand the differences between the various grades of hospital medical staff, and one may find this irritating at times but hardly surprising. Official misconceptions, on the other hand, are both inexcusable and infuriating. "We would normally expect the consultant to see new out-patients referred by general practitioners for a specialist opinion, but he may delegate specific tasks" (my underlining). This pretentious statement appears in a recent official report (Scottish Home and Health Department, 1967) and will therefore be read by many as an expression of fact, whereas it simply comprises a truism (new out-patients are always referred for a specialist opinion unless, of course, a clinic must be used by a general practitioner to gain access to diagnostic departments), and a pious hope (about what consultants might do or should do in ideal, and therefore hypothetical circumstances).

The fiction is maintained of junior medical staff being in "training grades", and of senior registrars being supernumerary: all this when the work load is enormous and time is so short. A

consultant is not, nowadays, only an expert to be consulted when his colleagues cannot manage by themselves, but also one more member of staff to do routine work. So it happens that consultants may, among others, make ward rounds, take clinics and sign discharge letters, and, if they do, they may themselves compose and write the relevant records. On the other hand, their sessions may be so few, or their total work so heavy, that a junior member of staff does all these things unaided.

The consultant delegates his duties according to the pressure he is himself under, and the number and the individual capabilities of the junior staff at his disposal. One cannot make rules about such matters; a house physician may be a genius and a senior registrar a complete fool, although it is always convenient to pretend that intelligence is directly proportional to status.

Record Order

This, of course, is greatly dependent on document format which is discussed in a separate chapter, and on brevity, which I shall consider shortly. A few well-designed pages are less likely to become untidy than a large collection of papers whose very design is baffling. Mode of presentation is equally important: verbal data can sometimes suddenly become significant when changed to a graphic form or when supplemented by photographs (especially coloured ones) or audiotape, and a series of X-Rays is easier both to handle and comprehend when the face of each

film is labelled with the patient's name etc., the date of exposure, and the sequence number.

Dr. ZA, a general physician, was asked to see two patients in an ante-natal ward, because they were both 36 weeks pregnant and had uncomplicated mitral stenosis. He found their cardiac states satisfactory on examination, but had to spend considerable time scrutinising the complicated and untidy case notes in order to mentally assimilate the necessary background information. He was then able to appreciate what the obstetricians themselves had overlooked, namely that one patient until admission had been having long-term penicillin therapy, which should have been continued, and that the other patient had a number of disseminated haemoglobin results which clearly showed that she was becoming rapidly anaemic, probably because of folic acid deficiency.

Record Legibility

Most of us can easily read our own handwriting and we criticise other people for their inability to do so. Such conceit is entirely illogical and the fact that clinical notes are still mainly handwritten can be justified only on the grounds of convenience. General statements to the effect that schools should teach better handwriting, and that ability to type should be an essential prerequisite to entry to medical school are completely unrealistic: other technological experts in this modern age are not expected to be clerical experts inter alia,

and there are no reasons, except the inevitable economic ones, why doctors should be regarded any differently in this respect. Illegibility of case notes can certainly sometimes be extremely dangerous.

Late one evening Dr. ZB, a house surgeon, was called to the ward to see a collapsed patient who had undergone hip arthroplasty several days previously, and had been suffering from recurrent episodes of severe hypotension ever since, in spite of apparently adequate intravenous fluid therapy. A medical registrar, Dr. ZC, had been consulted the previous day and had written several lines of comment in the case notes. Unfortunately his writing was indecipherable to both Dr. ZB and the nursing staff on duty. The situation was further complicated by the night sister volunteering the information that Dr. ZC had "said" that the patient should be given adrenal cortical extract if he became hypotensive again (the pure hormones were not available then). This seemed to Dr. ZB somewhat unlikely advice so he tried to telephone Dr. ZC, but was unable to reach him. He therefore proceeded to administer conventional vasopressive agents until Dr. ZC could be contacted. It eventually transpired that the sister's information had been correct, and the details had been included in the illegible case note. In spite of this medication being then given the patient died shortly afterwards.

In retrospect it is clear that death would probably have

occurred in any case, but the confusion would not have arisen had a proper treatment record then been in use.

Typing the Clinical Notes

There are very few hospitals where admission and progress notes are routinely typewritten, but the desirability of this is at last being recognised (Scottish Home and Health Department, 1967). The saving in time to clinicians would be enormous: one small study (Ralston, 1967) suggests that, in a surgical Unit which admitted 2,312 patients in one calendar year, 501 man-hours would have been saved had the house surgeons been able to dictate their admission notes to a secretary instead of writing them in longhand.

One Scottish surgeon has totally abandoned the traditional format of hospital case records (Cameron, 1967), and has re-organised the secretarial services in his Unit so that a sequential typewritten record is made during the course of every patient's episode of illness. This includes out-patient notes, transcripts (with reference numbers) of all diagnostic reports, and copies of all outgoing correspondence; the final document is archival in type, and seldom occupies more than two faces of one quarto sheet. Naturally, E.C.G. tracings and X-Ray films cannot be integrated into such a record, and they are kept separately, but all other reports are destroyed after transcription. Whatever

criticisms might be levelled at this type of record, illegibility could not be a valid one, and its compactness is of great practical value during current use.

Unfortunately the typing of all clinical notes presents serious difficulties, unless secretaries are continuously and immediately available for the 24 hours of every day of the year. In many orthopaedic clinics a secretary takes direct dictation on to her machine in the same room and at the same time as the clinician examines the patient. Perhaps it rarely matters what the patient hears or the secretary sees in these particular circumstances, but one could not imagine a similar arrangement working well in, say, a psychiatric or gynaecology clinic, so subsequent dictation, probably into a recording machine, would often be necessary.

With in-patients the situation would be even more difficult. One could hardly take a secretary (plus either typewriter or shorthand notebook) on every ward round without many patients becoming inhibited or resentful at the intrusion of a lay person into a doctor-patient interview, and the many eager ears in the ward would make the immediate use of even a tape recorder inadvisable. Emergency admissions often necessitate progress notes being made at hourly intervals or less, and therefore these would still most conveniently be handwritten, so that immediate reference to them would be possible at any time.

Updating of case records into typescript, either from audio-tape or handwriting would take them temporarily out of circulation, and it is really for this reason, and the time and effort of proof reading, that I, albeit reluctantly, doubt both the feasibility and wisdom of organising such a typewriting service on a general scale.

Brevity

A succinct record is a joy to read. To use not one word too many, nor yet one too few, is an art which few possess in any walk of life and certainly few in medical practice. To a great extent this is because undergraduates are taught that longwindedness is indicative of comprehensiveness and is therefore praiseworthy (Brooke, 1962). Here is the root cause of the later situation where "some passing colic in the night has been made the subject of two pages of diagrams of the belly and a mass of negative findings with great white spaces of paper unused between each observation" (Heffernan, 1966), and is something which could be easily remedied.

I fail to see why the term "N.A.D."* should always suggest to some readers that relevant physical examinations have been omitted, probably for reasons of laziness, nor do I see any virtue in routinely tabulating tendon and cutaneous reflexes if they are all expectedly normal. I am reminded, in this respect, of the story of the

* No abnormality detected.

politician and his chauffeur who became lost when driving on a foggy country road. Eventually the chauffeur saw a yokel standing by a gate, so he stopped the car and called out through the window, "Can you tell me where I am?" "You be sitting in a car", came the prompt answer. The chauffeur was angry but the politician said, "You know, politically that is a very good answer. It is perfectly truthful, and it adds nothing to the information we already possess".

On the other hand, private abbreviations, particularly initials, can reduce the entry in a case record to the worth of an uncracked code as far as an outside reader is concerned. This sort of brevity, beloved by obstetricians, is to be deplored.

Accuracy

We must, in this discussion, assume professional and technical competence on the part of the staff in diagnostic departments who furnish reports, and the clinicians in the wards and clinics who examine patients. Nevertheless, a record can still be inaccurately interpreted because of a reader's bias, and this can completely alter the subsequent management of the patient (Mitchell, 1967a). Sometimes the clinician becomes angry or frustrated by the patient's inability to answer simple questions, or by his (or her) general obtuseness, a situation which may, in itself, be diagnostic if the clinician's emotions have not been disturbed (Browne & Freeling, 1967; Alvarez, 1967).

800

The crux of the whole matter of accuracy, and, indeed, of quality in general of records, is the extent to which fact has been unreasonably biased by observer opinion. How far this can happen is nicely shown in the following story.

Dr. ZD, a consultant physician, was telephoned one afternoon by the assistant matron; she asked if he would go to see a staff nurse in the nurses' home who had been found sleeping in someone else's bed, and whose behaviour was odd. It so happened that he knew the nurse in question because she had worked in his Unit, and he remembered he had thought her both competent and emotionally stable. He, therefore, began the consultation in a deliberately sceptical frame of mind.

After his talking to her in the presence of the assistant matron the facts became clear. She had come off night duty and had gone to her own room to sleep. The constant barking of a dog had, however, kept her awake, so she had arranged with a friend, who was on day duty, that she might sleep in her room which was at the other end of the building, and she had taken two sleeping tablets to make sure she did not remain awake this time. Later a maid had come to clean the room, found her sleeping there and reported the matter. When she was roused abruptly she was still under the effect of the hypnotic and was both half-asleep and bad-tempered; this was the behaviour which had been described as odd.

Dr. ZD said one point still puzzled him. Surely no dogs were allowed in the nurses' home, so how could one have been barking? The assistant matron then explained that normally no dogs were allowed, but this one was a favourite pet of a new entrant to the pre-training school, and the matron had given her special permission to bring it to the hospital.

The point of the story is that a perfectly normal nurse, behaving in an acceptable and predictable way, was presented to an examining doctor in a way which suggested she was both irresponsible and anti-social.

Lines of Communication

National institutions, particularly the Armed Forces, are notorious for writing (and keeping) memoranda and letters about trivial matters which could be more rapidly and easily settled by person-to-person conversation. Similarly, many consultants in hospital will decline to visit a patient in another Unit unless a letter is first sent to them explaining the problem. This practice may be unwieldy but it has certain advantages: direct person-to-person communication may be more convenient by writing; the clinician seeking the opinion is at least encouraged to marshall his thoughts on the problem and present them coherently enough for a typist to process, and, perhaps best of all, the consultant can time his visit to suit only himself now that he has

been briefed, and he can (and should) make an entry in the progress notes, stating his findings and opinions.

Records are a means of communication, be it between the doctor and someone else, or the doctor and himself another time. Efficient communication is the purpose and the hallmark of a good medical record.

CHAPTER TEN

FORMAT AND BINDING

"Records serve the patient. This is their only excuse for being at all. Every other consideration is subordinate to this one. However designed, they may be a burden, but unless they fulfil this function they are a useless burden, and might as well be bonfired."

(Staines, 1966).

"The art of devising forms to be filled in depends on three elements: obscurity, lack of space, and the heaviest penalties for failure."

(Parkinson, 1965).

First Principles

Various elaborate recommendations about the design of medical documents used in N.H.S. hospitals have been made recently (Tunbridge Report, 1965; Western Regional Hospital Board, 1966; Walker Report, 1967) and there is little point in my going into similar detail, for, as Acheson (1967) says, "It is not long before any worker in the field of health records recognises the apparently immutable law that any two documents designed separately for the same purpose are bound to be different". However, there has been sufficient widespread adverse criticism of the Tunbridge Report to confirm Acheson's further remark (1967) that "In matters of detail the Committee has gone further than was necessary as a first step and appears to have abandoned the sensible precept that new ideas are best tried out on a small scale before they are recommended for general

implementation", and to justify some comments of my own.

Medical notes can quite easily and conveniently be made on sheets of blank paper. As they increase in number, variety and authorship, and are read and collated by increasing numbers of people, they tend to become correspondingly more untidy, and difficult to physically store and mentally assimilate; this is where the slippery downward slope begins. Everyone seems to assume that matters will be remedied by elaboration of form design - a document for each purpose, and each occasion - and that tidiness and order will thereafter re-appear. Of course they never do, and now that we have reached the stage of multiplicity of elaborate designs for documents of similar content, standardisation is the current slogan, but not, be it noted, standardisation with simplification.

When the desired order in document assembly is no longer self-evident it is time to call a halt and ask oneself why this is so. A lengthy printed discourse on how to handle particular documents is an immediate confession of defeat, and a file cover such as that shown in Figure 10/1 achieves little except to increase the cost of stationery.

I am forced to the melancholy conclusion that a qualified form designer is one type of expert who is seldom employed in the National Health Service. Inscriptions on hospital motor vehicles detail the names, qualifications and status of senior administrative officials for no good reason, and a similar situation obtains with form headings. I would agree wholeheartedly with Staines (1966) that, "There is no room to store blank paper and for this purpose traditional headings of paper-origin such as

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FIGURE 10/1.

FILE COVER INSCRIPTION.

Shown overleaf are the lengthy instructions printed on the front page of the unit file cover (case folder) in present use in the Western Infirmary, Glasgow. The cover measures $11\frac{3}{4}$ " x $9\frac{3}{4}$ ".

THIS FILE IS CONFIDENTIAL. IT MUST NOT BE HANDLED BY PATIENTS OR UNAUTHORISED PERSONS.

ORDER OF FILING.

Notes of each specialty are kept together, a divider being used to separate specialties. All reports of investigations of all specialties are, however, filed together at the back of the complete record.

In-patients. The notes of each admission are contained within a double sheet (formed by Nos. 1 and 10 below) and kept in the following order (from top to bottom):-

1. Admission and personal data form.
2. Special history sheets.
3. Continuation history sheets.
4. Investigation record.
5. Diabetic urine chart.
6. Fluid balance record.
7. Resuscitation chart.
8. Anaesthetic record.
9. Special Charts.
10. Special and non-medical documents.

On discharge, the temperature charts (if to be kept) and Kardex nursing records are placed on top of the notes of the admission. The discharge summary (coloured border) is placed on top of these again to complete the in-patient record.

Out-patients. All out-patients' notes are recorded on green forms.

After the discharge of an in-patient the follow-up notes (green forms) are built up in front of the last discharge summary in that specialty. Notes within a specialty may thus come to consist of alternating in-patient and out-patient notes, in chronological order from bottom to top.

Investigation reports. Sheets for the mounting of reports are to be added as needed in the following order (from top to bottom):-

- A. Radiation exposure record.
- B. "Other reports" (E.E.G., Audiograms, etc).
- C. X-ray.
- D. Pathology.
- E. Bacteriology.
- F. Biochemistry.
- G. Haematology.
- H. E.C.G.

When reports are issued on full-sized sheets, they are filed in front of the appropriate mounting sheet.

Editing Notes. On discharge of the patient it is the responsibility of the Ward Secretary to edit the notes before they are returned to the Records Office. All those who have to handle the notes are expected to co-operate however, in keeping them in proper order at all times.

'XYZ Hospital Management Committee' or 'the property of the Minister' is blank-paper junk".

Two basic principles must always be applied in form design (Foster, 1966). One is that the person who first fills in the form should be considered before any subsequent reader: it is, after all, "fruitless to require items of data to be recorded, however desirable they may be, unless there is a reasonable prospect of accurate information being obtained" (Acheson, 1967). The other is that horizontal and vertical guide lines should be compatible with the line spacers and tabulators of the majority of typewriters: otherwise the clarity of an immaculately typed record may be wholly spoiled. Most machines in hospitals use either Pica or Elite type face, i.e. 10 and 12 characters per horizontal inch respectively, and their single space settings give 6 lines per vertical inch.

The ultimate in simplicity and legibility is, of course, reached in the case record used by Cameron (1967) which I have already described, but this is so dependent on adequate and skilled secretarial support that it could not be employed generally, and, moreover, it involves the frequent transcription of information from diagnostic reports, which is fraught with danger and so better avoided whenever possible. In any system, the risk of transcription errors begins at the stage of patient identification, and even the first record of this data may be made, especially outwith office hours, by a nursing auxiliary or a hospital porter, neither of whom has good spelling ability or clear handwriting. Accurate initial recording of

patient identification data can only be ensured by its being done by skilled clerks, and the subsequent likelihood of transcription errors can be totally eliminated by the use of mechanical documentation.

Mechanical Documentation

This term refers to the process whereby the personal identification details of a patient are recorded on a master printing plate or stencil, so that they can be subsequently reproduced therefrom directly on to documents or on to adhesive labels, or (preferably) both. There are numerous commercial machine systems available, and different ones are used in different hospitals; the best among them enable multiple prints to be made from single master plates, and they have plate frames so that master plates containing basic information (name, date of birth, etc.) can be up-dated by trailer plates, when, for example, an out-patient is admitted to a ward. The master plates themselves can be filed in the records department to serve as an index of current bed-state, or they can be held in the individual unit files and used with handprinters to run off labels in each ward. The latter arrangement has the disadvantages that individual handprinters are expensive, noisy and wasteful of nurses' time; therefore it is usually more convenient for records departments to print so many adhesive labels initially on each patient-occasion and to supply, by return, further quantities when required.

To reduce writing of repetitive data to a once-only procedure is a basic principle of work study, which not only eliminates transcription errors, but also ensures that full information is supplied each time. It is rare, for example, for a patient's hospital unit number to be quoted on

every document bearing his name, but this will automatically result with mechanical documentation, provided that (a) full and correct particulars are recorded for (and on) the master plate, and (b) supplies of labels are always available. Streamlining a work system in this way is analagous to factorising a complex algebraic equation.

Labels in hospital should be, but regrettably are not always self-adhesive: considerations of marginal economy should never over-ride the high risk of staff becoming cross-infected (particularly with infective hepatitis and bacillary dysentery) by licking labels to stick them. Labels can identify pages in unit files, departmental request forms, specimen bottles, personal wrist bracelets for patients and lapel badges for staff, and packages and containers to and from various departments (e.g. pharmacy and central sterile supply). If a pre-arranged additional number of labels is attached to each departmental request form these can serve to mark intradepartmental records, additional containers, final reports, and special items such as X-Ray films and E.C.G. tracings.

The gain throughout the hospital in time and accuracy is enormous, and the following brief report indicates how a clinician can benefit.

A LABELLING SERVICE.

Notes on the resulting saving
in a clinician's time.

M.R.R.G. REPORT NO. 4.

First published: April, 1966.

1. That pre-printed labels, tear-off and with adhesive backs, will save time to the clinician is self-evident. He will be saved time writing on numerous request forms and on the labels of various specimen bottles, and in heading numerous pages in the case sheet. The various ancillary departments (X-Ray, pathology, etc.) will likewise be saved time in labelling reports, films, film envelopes, etc. There will be a marked increase in accuracy and completeness of information (e.g. the hospital number will always be present with the patient's name). Finally, the machinery for printing the labels can supply pre-printed envelopes for Unit typing purposes.
2. This short survey was undertaken to try to estimate roughly the time which might be saved by such a system in the Western Infirmary to the clinician alone, as regards only the main ancillary departments for which annual throughput figures can easily be obtained.
3. The term "nett saving" in the table overleaf is calculated as follows:-

$$\begin{array}{l}
 \text{Nett saving} = \text{time spent writing} \begin{array}{l} \nearrow \text{heading on form} \\ \text{or} \\ \searrow \text{label on bottle} \end{array} \\
 \text{minus} \\
 \text{time spent tearing off and} \\
 \text{sticking on a pre-printed label.}
 \end{array}$$

4. The figures were estimated on the basis of a sample undertaken personally by the author. Many people write more slowly, so the nett saving can be assumed to be a minimum figure.

5.

SERVICE	THROUGH- PUT FOR 1965	TIME TO WRITE EACH FORM HEADING	NETT SAVING BY LABELS FOR FORMS	NETT SAVING BY LABELS FOR BOTTLES	TOTAL NETT SAVING
		Sec.	Hrs. Min.	Hrs. Min.	Hrs. Min.
X-Ray	53,640	40	447 -	- -	447 -
Bacteriology	32,635	20	91 -	182 -	273 -
Biochemistry	26,046	20	72 21	144 42	217 3
Pathology	7,063	20	19 37	39 14	58 51
Haematology	50,000	20	138 53	138 53	277 46
E.C.G.	13,857	20	38 29	- -	38 29
Physiotherapy	5,084	25	21 11	- -	21 11
E.E.G.	566	40	4 43	- -	4 43
TOTAL					1338 3

6.

Thus the total saving in wards and clinics for these items alone in the Western Infirmary in 1965 would have been at least 1338 hours, which represents, in terms of a 40-hour week, approximately $33\frac{1}{2}$ weeks.

Document Sequence

The order in which papers are kept in a unit file is fundamentally illogical. Usually the clinical notes for each episode of illness form a set of pages which are read in conventional book order, i.e. starting at the front and reading towards the back. However, each such set is filed so that the oldest is behind and the newest in front. Diagnostic reports are usually kept separately within the file, and each set of these (X-Ray, biochemistry, etc.) is made up so that the oldest reports are on pages behind and the newest in front.

Appendix B of the Walker Report (1967) discusses the subject in great detail, but its remarks are disappointing because they are so complex and because they touch on the basic reason for filing disorder, yet appear at the same time to evade its frank discussion. This tends to confirm my impression that most clinicians have long since come to accept the present Alice-in-Wonderland order of filing, and now seldom question why it was ever adopted in the first place.

There are only two main reasons why diagnostic reports, for example, are so often misplaced in a unit file. Firstly, if there is no appropriate mount sheet already in the file (or the one there is full) and there are no spare ones immediately available, the report will nevertheless almost certainly be placed in the file there and then, but mounted on some inappropriate sheet. Secondly, although diagnostic reports are the most numerous of all incoming documents to a unit file, their mount sheets are always at the back, and become less and less

accessible as the file, as a whole, grows. Consequently, if a report has to be placed in a bulky file, the temptation is to avoid as much as possible moving pages off and on the binding clip, and instead to insert a new mount sheet well forward and in the wrong place.

Various steps may be taken to prevent this situation. In the first place, it would be sensible to have a single design of mount sheet for all reports: when a sheet is empty its inscription is irrelevant and when reports are mounted on it its inscription is superfluous; all that is necessary is that different types of reports are physically segregated on to different mount sheets, and even this may be considered unnecessary if the reports are coloured in some way so that each type is easily and rapidly distinguishable from another. Next, printed directives to staff about how to place papers within unit files are, as I have already said, both valueless and expensive; colour signals on pages to indicate filing order are equally useless, because colours have no self-evident order of sequence.

Page numbering is an obviously useful measure, provided that the numbers are sufficiently separated (arithmetically) from one another to allow for the creation and insertion of new page designs at any point. I would suggest that an existing series of pages should be numbered in multiples of ten, i.e. 10, 20, 30 etc., and that the intervening unused numbers would serve for future pages yet to be designed. It does not matter, after all, whether the numbers chosen are in close arithmetic proximity to one another; they are only used as signals of sequence which

are immediately meaningful to anyone who can count.

Yet we still have not reached the heart of the matter. What is needed is a binding mechanism which will be minimally expensive and not at all bulky, and yet will afford the facility of a loose-leaf system, whereby the set of papers can be split easily and without damage at any point, and separate sheets immediately inserted or withdrawn. Seven different mechanisms have been compared in great detail in a recent report (Western Regional Hospital Board, 1966) but none has fulfilled all the desired criteria. There is, however, one type of binding already in use in numerous hospitals, which seems to be satisfactory in all respects. It is the "Quick Binder" patented by George Anson & Co., but is not the "Anson Folder" specified in the Regional Board report.

My own report, which follows, details the advantages of the "Quick Binder", and also demonstrates how problems and disagreements about record design can hinge mainly on binding systems rather than page format. I suggest that the use of "Quick Binder" folders and numbered pages should largely overcome the problems of document sequence, and be much preferable to the few ingenious but essentially clumsy special methods of binding in current use, such as that at St. Luke's Hospital, Guildford (Jenkins, 1966).

HOW MANY FOLDERS?

Some comments on two designs
of hospital case records in S.W. Wales.

M.R.R.G. REPORT NO. 13.

First published: November, 1966.

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1. INTRODUCTION

- 1.1. In November, 1966, I visited several hospitals in S.W. Wales at the invitation of Dr. Eirian Williams, in order that I might comment upon two separate designs of case records at present in use there.
- 1.2. The explanation of the terms H.F.4. and C.F.1. are given in paragraph 4.1.

2. GEOGRAPHICAL BACKGROUND

- 2.1. The two principal hospital centres in S.W. Wales are Haverfordwest and Carmarthen. There are two consultant physicians in the area, one of whom (Dr. Williams) lives near Haverfordwest, and the other near Carmarthen.
- 2.1.1. It should be remembered that in England and Wales all consultants in medical practice are of equal standing, unlike in Scotland where there are two groups, viz. consultants in charge of hospital beds, and "junior" consultants (i.e. the "patriarchal" system).
- 2.2. The general medical beds in Haverfordwest are located in Withybush Hospital, and the out-patient clinics in the Pembroke County War Memorial Hospital. The general medical beds and the out-patient clinics in Carmarthen are situated in the West Wales General Hospital in that town.
- 2.3. Dr. Williams admits the majority of his patients to Withybush Hospital, but also attends both in- and out-patients in the West Wales General Hospital. In the case of the other consultant physician the converse applies.
- 2.4. The West Wales General Hospital is at present still being built, although already partly in use. It will eventually be a District General Hospital of conventional type. In Haverfordwest, after long discussions, it has been decided to build a new hospital at Withybush, which will replace the existing two hospitals in the town. The present Withybush Hospital is a former E.M.S. prefabricated building.
- 2.5. At present patients from south of Milford Haven are seen at Carmarthen, which is nearer than Haverfordwest. This situation will be radically changed when the new road bridge across the Haven is completed.

3. HISTORICAL BACKGROUND

- 3.1. In January, 1964, Associated Industrial Consultants Ltd., in association with the O. & M. Department of the Welsh Hospital Board, presented to the South West Wales Hospital Management Committee a very full series of work-study reports entitled "Recommendations for Improved Medical Records Procedures". One of these reports made detailed recommendations for a new case folder, which would be based on the unit file system and the contents of which would be divided into four sections, each bound separately within the one cover. This, in fact, is essentially one of the two designs of case records now in use.
- 3.2. These "Recommendations", and the remarks upon which they are based, seem to me to be both reasonable and comprehensive, although I would personally disagree in detail with some of the final items of advice. Their adoption resulted in the provision in the hospitals in Haverfordwest and Carmarthen of such items as ward record trolleys, mechanical documentation equipment, laboratory copying equipment, "Kardex" files for nurses' records, and personal dictation machines.
- 3.3. There was opposition from many of the clinical staff in the area to the introduction of the design of case folder described above, and preference was expressed for a new system involving a set of four folders for each patient, each set to be kept inside a master folder. It was finally arranged that for a trial period this alternative design should be used in certain Units in Haverfordwest, whilst the design recommended by A.I.C. Ltd., would be used elsewhere.
- 3.4. In May, 1966, the O. & M. Department of the Welsh Hospital Board published a report for the South West Wales H.M.C., comparing and contrasting the two designs of case folder, and found in favour of the original design as proposed by A.I.C. Ltd.
- 3.5. This latter O. & M. Survey Report has been sharply criticised by the supporters of the other case folder; they claim the Report is inaccurate in its statements and unfairly biased in its conclusions.
- 3.5.1. I personally feel that these criticisms are fair. I think this latter Report is much inferior in all respects to that of A.I.C. Ltd., in that it is not only poorly composed, but mixes fact and opinion in an unacceptable manner. This reader, at any rate, is left with the impression that the issue was prejudged from the start.
- 3.6. The two designs of case folder continue in use, and no agreement has been reached to resolve the matter.

4. SPECIFICATION OF EACH DESIGN

4.1. TERMINOLOGY

Dr. Williams's case notes in Haverfordwest are kept in the 4-folder design and in Carmarthen in the folder recommended* by A.I.C. Ltd. Let us, therefore, for convenience, hereafter refer to the 4-folder (Haverfordwest) design as H.F.4., and the other (Carmarthen) design as C.F.1.

4.2. DETAILED DESCRIPTION OF C.F.1.

- 4.2.1. Case folder with 2 internal spinal gussets.
- 4.2.2. Pocket inside the folder for preprinted request forms, and nursing reports, temperature charts, fluid balance charts, etc.
- 4.2.3. Correspondence items bound to one gusset by an elastic lace.
- 4.2.4. Report and consent forms bound separately to the other side of the same gusset by an elastic lace.
- 4.2.5. Pages of clinical notes and the front "identification sheet" bound to the other gusset, also by an elastic lace.
- 4.2.6. C.F.1., therefore, consists of one case folder for each patient, this folder containing 3 groups of separately bound pages, and one pocket.

4.3. DETAILED DESCRIPTION OF H.F.4.

- 4.3.1. Each patient has his notes divided into 4 parts, each part being separately bound in a different coloured folder, by an elastic lace as follows:-
 - (a) Charts (Buff folder).
 - (b) Correspondence (Yellow Folder).
 - (c) Report and consent forms (Blue folder, with a pocket for preprinted request forms).
 - (d) Clinical notes and "identification sheet" (Red folder).
- 4.3.2. In the case of each patient the 4 folders are filed in a master folder.

* The folder at present in use is essentially similar to that so recommended.

4.4. ESSENTIAL DIFFERENCES BETWEEN C.F.1. AND H.F.4.

- 4.4.1. The page formats are identical in the two designs.
- 4.4.2. The groups of pages are the same in the two designs, i.e. charts, correspondence, report and consent forms, and clinical notes and identification sheets.
- 4.4.3. The only difference between the two designs, therefore, is in the method of binding. C.F.1. is a master folder with 4 separately bound sub-sections, and H.F.4. is a master folder with 4 sub-folders lying free.
- 4.4.4. The dispute is, therefore, about how case notes of agreed format should be bound.

5. CRITICISMS OF H.F.4.

5.1. FAVOURABLE

- 5.1.1. Because of the absence of folder gussets, the individual pages lie flatter than in C.F.1., which means:-
 - (a) Writing on an opened page in any sub-folder is easier.
 - (b) Less space is wasted at the sides of the pages.
 - (c) Less mechanical damage to the edges of the pages is inflicted by the laces.
- 5.1.2. Mainly as a result of the above factors, the end result is a tidier collection of documents for any one patient.
- 5.1.3. In practice it is marginally easier to locate a particular document when separate folders are in use.
- 5.1.4. It follows that, in searching for a particular document, fewer other pages are handled, so all the pages stay in good condition longer.
- 5.1.5. The various charts are firmly and tidily bound instead of lying loose in a pocket of a folder (as in C.F.1.).

- 5.1.6. It has been argued that, during discussion on a ward ground, the various folders for one patient can be handed for scrutiny to different persons simultaneously. How important an advantage this is, is open to argument.
- 5.1.7. Should selective destruction of previous case notes be adopted in the future, no further sorting would be necessary. Moreover, sub-folders themselves could, in such circumstances, be used again.
- 5.2. ADVERSE.
- 5.2.1. The documents for each patient occupy more shelf space.
- 5.2.2. There is a risk of misfiling or mislaying a sub-folder.
- 5.2.3. The documents for each patient cost more. 1,000 sets of H.F.4. (sub-folders, laces, and master folders) cost £59.12.0d., whereas 1,000 sets of C.F.1. (folders and laces) cost £29.7.0d.*
- 5.3. FOOTNOTE

Because of these adverse features of H.F.4., Dr. Williams has recently begun using a special single case folder, embracing a single set of pages, for patients for whom it appears that the recorded data will be brief, and that any follow-up will be very short.

6. CRITICISMS OF C.F.1.

These have already been implied in my remarks on H.F.4. Briefly, I think C.F.1., whilst both cheaper and less bulky, is, nevertheless, very inconvenient because of its multiple binding, because its pages will not lie flat, and because its pages consequently tend to tear at the binding holes.

* These figures are quoted from the O. & M. Survey Report of May 1966 (see paragraph 3.4.).

7. CONCLUSIONS

- 7.1. The dispute is over how case notes of agreed design should be bound.
- 7.2. Because of the need to conveniently remove or add pages anywhere within the body of a case record, loose-leaf binding would have everything to recommend it were it not for its bulk and expense.
- 7.3. C.F.1. apparently offers something not far short of loose-leaf binding. These advantages of C.F.1., are, however, in my opinion, more than offset by very marked disadvantages.
- 7.4. I think that, in spite of its disadvantages, H.F.4. is undoubtedly the preferable of the two designs.

8. RECOMMENDATIONS

- 8.1. Because of the disadvantages of H.F.4., an even more useful design of case folder should be sought.
- 8.2. I suggest that the "Anson Quick Binder", should be compared in use with H.F.4.
- 8.2.1. The "Anson Quick Binder" is a patented design of folder which incorporates two plastic laces. The pages bound inside the cover are held between two spinal gussets, and the plastic laces are riveted to one gusset and protrude freely through the other.
- 8.2.2. The plastic laces allow any page in a bound set to lie fully open and flat. The presence of the gussets in the folder is therefore a minimal disadvantage when writing on any page.
- 8.3. The design offers a facility of page insertion and removal not far short of that of a conventional loose-leaf system.
- 8.4. The copyright of the design lies in the combination of folder and laces and the latter cannot, therefore, be supplied alone. However, the folder itself can be supplied to any reasonable specification, and an acceptable price for a bulk order can be negotiated with the manufacturers.
- 8.5. Such a folder is in use in numerous hospitals, including the Southern General Hospital, Glasgow, and the Queen Elizabeth II Hospital, Welwyn Garden City, and has newly been introduced in those of the Glasgow Northern Group.
- 8.6. The manufacturers are George Anson & Company Limited, Solway House, Southwark Street, London, S.E.1.

9. ACKNOWLEDGEMENTS

I must thank all the various members of staff of Withybush, Pembroke County War Memorial and West Wales General Hospitals for their help during my visits.

The File Covers

Considering the extra printing costs involved (Ministry of Health, 1959), the various recommendations which have already been made about inscriptions on the front faces of file covers (case folders) are extravagant as well as unrealistic. "Confidential" (Tunbridge Report, 1965) is probably wise, but definitely not "The information enclosed in this record is highly confidential" (Walker Report, 1967). "Not to be taken out of the hospital" (Tunbridge Report, 1965) is pointless: if such a directive is necessary then it will also be ineffective. "Not to be handled by the patient" is an open invitation to that individual to peruse the notes and the remedy is to place them beyond his reach; on no account should in-patient notes be kept on shelves in ward corridors where visitors can read them, as in the London Clinic (Campbell, 1967). The patient's unit number should be inscribed on the file cover, but so also should his name, although the latter, surprisingly, is not always regarded as essential (Tunbridge Report, 1965). One does not say on a ward round, "Sister can I have the notes of No. 630581?" (Anderson & Lennox, 1964), and un-named file covers would make the storing and finding of current case notes an impossibly difficult task.

Printed colour coding on the file covers is useful if terminal digit filing is to be used in the records department, and here I touch on a subject which is a source of continuous and bitter argument among medical records officers. Why this is so I fail to understand, for the issues are plain and of little general importance. Terminal digit filing was first employed in commerce some 50 years ago, and is designed to

disperse working staff evenly throughout crowded filing premises.

A file number such as 123456 is considered split in some pre-arranged manner: for example, 1234/56 or 123/4/56, and the file, instead of being placed in conventional sequence (after 123455 and before 123457), is now located in special sequence in an appropriate section unit, i.e. 1234/56 would be in section 56 after 123356 and before 123556, and 123/4/56 would be in section 56, subsection 4, after 122456 and before 124456. Colour strips on the spines of the file covers would indicate the terminal digits (usually only two strips are used), so all the 56s (say) would display a strip for 5 and a strip for 6, and a misfile in any bundle would be readily noticed.

The system has advantages where filing space is cramped, staff numerous and throughput high. Newly filed records are spread throughout the shelves instead of being all at one point; moreover, the bulk expands evenly throughout, instead of in a linear fashion. On the other hand, selective weeding is more difficult in that the relevant papers are scattered in a similar fashion. On balance, the extra expense, especially for the colour coding, which is essential to offset the increased danger of misfiling, is not justified if the storage premises are capacious, the staff few and the throughput low.

Specific Documents

Casualty Records.

The organisation of casualty departments varies greatly from hospital to hospital. In spite of their being often now renamed accident

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departments, many remain, in fact, "casual dispensaries" at which all and sundry of patients are seen. Sometimes, also, all emergency cases for both medical and surgical Units are seen in the casualty department before a final decision is made whether to admit them as in-patients. The number of patients attending the department is then so large, in proportion to the total annual throughput of other in- and out-patients in the hospital, that integration of all casualty records within the general records system is virtually impossible. Moreover, such departments, whether of the "casual" or genuine accident type, may cater for patients on the first occasion only, and follow-up is always carried out elsewhere, e.g. fracture clinic, orthopaedic clinic, general surgical clinic, and so on. Casualty records tend, because of all these factors, to be cards of simple format, and they serve quite well in practice. What is often lacking is the easy facility of communication with general practitioners; they should always be kept fully informed, and letter proformae may be useful for this purpose.

Clinical Notes

There is, to my mind, the great advantage of simplicity in having pages for clinical notes standardised, without purpose-related headlines, so that they will serve for in- or out-patients, and for admission or progress notes; horizontal guide lines are usually necessary for clarity. Specific page designs, incorporating such features as schematic anatomical diagrams and pre-printed check lists, could be easily provided by superimposed printing on the standard plain page format.

Consent Forms

Legal consent to medical and surgical treatment and the wording of the relevant forms to be signed are considered in detail in a booklet issued by the Medical Defence Union (1966), and although the wording on the forms may be thought to be over-fussy it would be wise for all concerned to accept the M.D.U.'s advice on this matter as authoritative.

Departmental Request Forms

A standard design for all request forms is perfectly feasible and avoids the necessity for each ward and clinic having stocks of 6 or more different forms always available. An example of a standard form already in use is shown in Figure 10/2; the design could doubtless be improved, but, significantly, the various departments actually reached agreement about it. The same form in different colours is used in other hospitals in the same administrative group, so that area laboratories receive similar request forms from all sources.

Diagnostic Report Forms

One must remember that in some laboratories the request form accompanies the specimen to the work bench, and the results are reported and distributed on the same document. Copies may be made for the laboratory's own records by methods ranging from simple carbon paper to sophisticated duplicating machinery.

In some instances, particularly where data is numerable as in biochemistry, results are recorded by up-dating a cumulative report sheet which is then machine-copied and distributed. This means that each such

FIGURE 10/2.

STANDARD REQUEST CARD.

The card shown overleaf was recently adopted for 7 diagnostic and 2 therapeutic departments in Stobhill General Hospital, Glasgow. It measures 8" x 5" and is printed on one side only.

Complete Patient's Name, Address, etc., or attach Label in appropriate place.				Surname (Mr./Mrs./Miss) Forename		Unit Number		Type of specimen		Department Number	
Date of Birth		Age		Sex		Ward/Dept.		Date and time collected		Previous LAB/ E.C.G./X Ray No.	
Address				Consultant/G.P.				Date of Admission			
Occupation											
Tick Appropriate Box				Diagnosis							
Bacteriology <input type="checkbox"/>				Clinical Notes							
Biochemistry <input type="checkbox"/>											
E.C.G. <input type="checkbox"/>											
Haematology <input type="checkbox"/>											
Occupational Therapy <input type="checkbox"/>											
Pathology <input type="checkbox"/>											
Physiotherapy <input type="checkbox"/>											
Virology <input type="checkbox"/>											
X Ray <input type="checkbox"/>											
Treatment				Date of Onset				Ambulance Required <input type="checkbox"/> Chair <input type="checkbox"/> Stretcher <input type="checkbox"/> Walking <input type="checkbox"/> Ward <input type="checkbox"/>			
								B.P. Digitalis			
Examinations Required				Doctor's Signature							

STOBHILL HOSPITAL, GLASGOW, N.I.

Telephone SPR 5042

document in a unit file will be superseded by a subsequent report form and can be destroyed. Clearly, then, there is nothing to be gained by universal standardisation, and the Tunbridge Report (1965) makes the cardinal error of recommending a report form with the patient's name, etc., at the bottom, thus precluding copies of such a document being stored in a card index (Carter, 1967).

I would suggest, in passing, that if requests for several tests regarding one patient are made simultaneously to a laboratory which has copying machinery, a single request form should suffice, which can be copied as many times as necessary in the laboratory after the specimens arrive. This would save valuable time and effort in despatching, for example, multiple swabs from one patient, perhaps accompanied by blood culture bottles, and specimens of cerebro-spinal fluid.

Investigation Sheets

The management of a patient is greatly simplified by the use of a special page in the current case notes to detail diagnostic investigations. Horizontal guide lines are essential, and columns should be sufficiently numerous to permit the tidy recording of who ordered a test (initials), when a specimen was sent to the laboratory (date), and whether the report is yet to hand (date or a simple tick-mark, depending on individual preference).

Such a document has no real permanent value: it is intended to serve as a pending check-list, so that at each ward-round a clinician is reminded of progress to date as regards special investigations, and so that he can quickly become aware of results not reaching him when they should.

Multi-purpose Clinical Charts

In some hospital Units details of drug (particularly antibiotic) therapy and investigations are still recorded on the T.P.R. charts*, but this involves the unfortunate ward sister spending a great deal of her valuable time making daily entries in different coloured inks, and the result is usually more decorative than informative. The most comprehensive document of this type which I have yet seen came from Israel, where graphic condensed reports are widely used (Winter, 1966). Personally I strongly dislike this kind of chart: legibility, clarity and accuracy are seriously prejudiced for the sake of brevity.

X-Ray Films

Identification particulars are usually either handwritten in white ink or photographed on to films which have newly been taken; in both methods there is some risk of error, particularly where the radiographer who operates the camera is not the person who inscribes the films (Wakely, 1967). I have found (Mitchell, 1967b) that, in large departments of radio-diagnosis equipped with automatic processing methods of developing and fixing films, photographic markers such as that manufactured by H.A. West (X-Ray) Ltd.ø, are regarded as perfectly satisfactory, but there is no doubt that the recent advent of a new commercial device, the "Datacord X-Ray Marker"†, is a notable advance, because this makes it now possible to directly photograph

* Temperature, pulse and respiration.

ø 41 Watson Crescent, Edinburgh, 11.

† manufactured by Peter Smith Instrumentation Ltd.,
56 Southwood Gardens, Kenton, Newcastle-upon-Tyne, 3.

identification particulars from a request form on to an unexposed film, which saves a great deal of clerical time and reduces the risk of transcription errors to an absolute minimum.

E.C.G. Tracings

These are becoming increasingly numerous and lengthy in hospital case notes, and their handling continues to pose major problems. They are generally recorded by a hot stylo touching heat-sensitive paper, which also smudges and marks later when a page above in the case notes is written on, and which stains heavily, though temporarily, when wetted with glue. The very length of one tracing, and the relevance of its report to specific segments, necessitate the excision of these segments from the original long paper strip, and their display on a mount sheet close beside the report. Reports and tracings are frequently significant as regards their sequential patterns, so they must be filed to permit convenient comparison with one another.

The Tunbridge Report (1965) opts out of further consideration of the matter by remarking that "the time is not opportune to consider a standard form", and the Walker Report (1967) makes the thoroughly stupid recommendation that E.C.G. (and E.E.G!) tracings should be filed in a pocket in the back of each case folder. A great deal of careful and detailed investigation is urgently required to devise a method of editing E.C.G. tracings so that (a) they remain neatly in case records over a long period, becoming neither dog-eared nor badly marked, and (b) editing is cheap both in time and materials. Unfortunately these two requirements tend to be vicarious.

I have already shown (M.R.R.G. Report No.1) that, rather than make extra original copies of a tracing for departmental purposes, it may be preferable to make and edit a single original copy and duplicate this by machine. Moreover, the main reason for keeping departmental records is to enable a reporter to easily compare previous tracings with one newly taken, so if there is no central reporting service for E.C.Gs. in a hospital, and there is a unit file system for case records, the keeping of duplicate copies in the E.C.G. department is a complete waste of time, effort, space and money.

An E.C.G. 12-lead series can be beautifully displayed (in the configuration of Einthoven's Triangle if so desired) by mounting the cut strips face downwards on a sheet of transparent plastic, from which the protective backing has newly been peeled, and covering the lot by a plain paper mount sheet, which adheres to the free edges of the plastic. Even with practice one series cannot be labelled, cut and mounted thus in less than 4 minutes (Mitchell, 1963), so this method is of no routine value. In one Glasgow hospital, on the other hand, mounting is done very rapidly by stapling the strips of 12 leads (in two banks of 6) at one end to a mount sheet, at the foot of which is handwritten the reporter's comments. This may not present the tracing to the reader in a very elegant pattern, but it prevents busy E.C.G. technicians spending too much time on tedious editing work (Fraser; 1967).

Certain other methods which achieve a compromise between the two just described should be mentioned. I have already detailed the

system of securing tracing strips to a mount sheet by "Laminated Sellotape" which is used in the Western Infirmary, Glasgow (M.R.R.G. Report No. 1): it is both fussy and expensive, although the record is well displayed. The Cambridge Cardiogram Mount is a special two-page card document: the back page has pre-gummed panels outlined to accommodate the strips in a series, and the front page has plastic windows placed in it so that the strips are displayed through them. Identification data and the reporter's comments are written on the front page, and the document is useful in many respects. Unfortunately it is too bulky to house in unit files (each page is as thick as the average unit file cover), and somewhat expensive (1/-).

A double-layered page of clear plastic is one of the most useful devices I have yet seen for mounting E.C.Gs. (Jenkins, 1966). The two layers are bonded along horizontal and vertical lines so that open-sided pockets are created, into which E.C.G. strips can be easily placed. There are six half-page-width pockets in each sheet (which allows for the display, to front and back, of 12 strips) plus one full-width pocket at top and bottom. The latter can house long strips cut to show arrhythmias, and the former a card or paper panel, on one side of which is noted the patient's identification particulars etc., and the other the reporter's comments.

Computerised Records

Some hospitals already use current record forms specially designed for computerisation (Glen, 1966), and the variety and scope of

these will undoubtedly increase in the near future. Standardisation of these forms is both quite impossible and highly undesirable, because the information they contain is being chosen on a pragmatic basis.

Paper Sizes

The adoption of International Paper Sizes (British Standards Institution, 1959; British Federation of Master Printers, 1960; & see Table 10/1) seems fairly certain in view of the firm recommendations of the Tunbridge (1965) and Walker (1967) Reports, although I know from personal experience that stocks of such paper are not yet routinely held by all printers and often have to be specially cut. The N.H.S. record envelopes supplied to general practitioners to house their patients' case papers measure 7" x 5" in England and Wales and 8" x 5" in Scotland, and they are woefully inadequate as regards both size and volume (Acheson, 1967). There is growing widespread dissatisfaction about the difficulties of filing correspondence from hospitals (Greenwood, 1966; Loughbridge, 1966; Marsh & Simons, 1967; Moses, 1966; Somerville, 1966; Wyon, 1966); these difficulties will persist until standardisation of medical record paper sizes is considered in relation to general practitioners as well as hospitals.

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T A B L E 10/1.

PAPER SIZES.

INTERNATIONAL.	BRITISH.
A.4. 210 mm. x 297 mm: $8\frac{1}{4}"$ x $11\frac{3}{4}"$.	Foolscap. 8" x 13".
A.5. 148 mm. x 210 mm: $5\frac{7}{8}"$ x $8\frac{1}{4}"$.	Quarto.. 8" x 10".
A.6. 105 mm. x 148 mm: $4\frac{1}{8}"$ x $5\frac{7}{8}"$	Octavo. 8" x 5" (approx).

It should be noted that the International Sizes decrease each time by halving the longer of the two axes.

CHAPTER ELEVEN.

FUTURE TRENDS

"The therapeutic revolution we have witnessed in the last thirty years makes it possible for so much to be done for the patient which was hitherto impossible that doctors are conditioned to think in terms of cure of symptoms by pharmacy or surgery. This leads to the concept of medicine by computer. Signs and symptoms are inserted at one end of the machine and out come diagnosis and treatment at the other. In such a system sympathy plays no part; it would not be expected by the patient, or bothered about by the doctor."

(Browne & Freeling, 1967)

"I read recently of the tragic mistake in a hospital where the wrong leg was amputated from a patient. The surprising thing is not that this should happen at all but that it does not happen every day. In very many hospitals a situation may arise where the nurses are Italian or Spanish, the registrar is a Nigerian, the houseman a West Indian or a Malaysian and the patient a Glasgow Scot. How on earth any communication between this cross-section of the United Nations can take place at all is very difficult to understand."

(Bevan, 1967)

Organisation.

Recent statistics indicate a busy future. In England and Wales the total increase in hospital beds in the first 18 years of the National Health Service was only 0.3%, yet 22% more new out-patients were seen in 1966 than in 1948, and the number of hospital deaths and discharges rose by 66%. By 1966, to cope with this extra work load, medical staff was greater by 63%, nursing staff by 50%, technical staff by 140%, and administrative staff by 63%. (Lees, 1967).

Coincidental with this increased activity has been a growing disregard for the confidentiality of information in medical records. Administrative procedures may over-ride the personal wishes of particular patients about which general practitioner is informed of an illness in hospital (British Medical Journal, 1967); machine copying of medical case notes and correspondence is all too easily done without the author's knowledge or permission (Sharrard, 1967); and central data banks may enable inquisitive lay personnel to readily discover such private information as the sex life, and the name and address of an unmarried woman. (Burne, 1967).

The publication of the Salmon Report (1966) has prompted the Institute of Hospital Administrators to make to the Minister of Health comments (Hospital, 1966) which are closely reasoned, fallacious and highly dangerous. They claim, for example, that "Today hospital administration can no longer be viewed in the simple terms of comprising a partnership of medical, nursing and lay administration. In the complex of the modern hospital medicine and nursing are only two of the wide range of essential services" and "if an effective and unified system of hospital administration is to be achieved it must be accepted that the chief nursing officer, in common with the other heads of service, must be responsible for her work to him, and not directly to the governing body, even though she may have right of access to that body" (my underlining). I would wholeheartedly agree with Blundell and Lowry (1967) that these views constitute a "Charter for Hospital Secretaries", which, if implemented, would not only interfere with

professional freedom, but also permanently ruin the hospital service.

Equipment.

If sufficient money and resources are provided to assess and fully utilise available mechanical devices, medical care in the next few decades will be revolutionised: in particular, the recording of information will be easier and more accurate.

Television.

Videotape recorders (V.T.R.) are already beginning to supplant cine-cameras in angiography, and this overall trend is unlikely to be reversed by the introduction of new designs such as the Australian National Heart Foundation Camera. The full potentials of television as a control and communications medium are, however, yet to be exploited, even in non-medical sectors (Foster, 1967).

E.V.R.

A new audio-visual system known as Electronic Video Recording and Reproduction has been developed I.C.I., CIBA and the Columbia Broadcasting System. Firstly, an electron beam recorder generates from a television camera, videotape recorder or cine-film projector an E.V.R. 8.75mm. master film in black and white or colour. This master film is then run through a high-speed printer which can make multiple copies packed in cartridges measuring $7\frac{1}{2}$ " in diameter and $\frac{1}{2}$ " in thickness; a master film recorded in 20 minutes can be printed in about

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30 seconds. Finally, for reproduction, a cartridge is inserted into a player which contains an electro-optical transducer, and which is connected to the aerial terminals of a conventional T.V. receiver. The cartridge in the player is automatically threaded, played (to show on the T.V. screen), rewound and ejected, and one player can display one film simultaneously on a number of T.V. receivers.

Electronic Computers.

Although their applications in medical practice are usually related to automation (e.g. auto-analyser systems in biochemistry, and patient monitoring systems in intensive-care units) or to information collation and retrieval (data banks), direct recording of current clinical information into computers is being tried in a few centres (Anderson, 1967; P. Hall, 1967). Computer-assisted calculation for radiotherapy doses and computer-evaluated bacteriological identification (Payne, 1966) have encouraged many to prophesy the day when computer-assisted diagnosis will compensate for the shortcomings in the personal knowledge and experience of individual clinicians (Boyle, 1967; Wayne, 1966). Already there is a mass of literature in which this idea is discussed, decried or defended (Card, 1967; G.H. Hall, 1967; Scadding, 1967; Taylor, 1967; World Medicine, 1967a).

I, personally, am very sceptical of the feasibility of a computer being successfully programmed to make routine clinical diagnoses, although there is little doubt that, where diagnoses are presently made by mental evaluation of data lists (as in congenital heart disease)

or by branching pattern logic (as in reticuloses), computer collation of data might be both less tiresome and equally accurate. Success would depend on whether or not a suitable program* could be written, and I suggest that the main benefit from a computerised system of diagnosis would be the validity checks which would be possible to yield useful further information about the diseases within the differential diagnosis.

Diagnosis by scoring methods is necessary if data remains confusingly incomplete; it is based on probabilities calculated from past experience. Further clinical investigation, aimed at obtaining pathognomonic information, is always preferable, although it must be admitted that few diagnoses are ever made from data which is fully pathognomonic. To my mind, computerised scoring methods could be dangerous by encouraging doctors to regard the use of probability theory and multifactorial analysis as a valid substitute for methodical interrogation and examination of a patient. Moreover, medical symptoms and signs are comprehensively described not in 3 dimensions but in 4 (space-time narrative), and thus cannot be stored in full by a computer except in variable-field/length prose format; this makes scoring impossible without preliminary abstraction.

It seems certain, therefore, that future hospital medical records will continue to be made primarily on paper, much as at present, and that new mechanical devices will facilitate rather than change this method of storing information.

* spelling defined by the British Standards Institution (1962).

CHAPTER TWELVE.

C O N C L U S I O N S

"Suspicion of the motives and competence of the doctor is often a manifestation of a particular trend in present-day society—the recoil against the expert. There is a reaction against the pedestrian bourgeois business of learning one's trade."

(Catalyst, 1967)

"In the scientific analysis of a problem the facts should lead to belief about the nature of the problem, rather than belief (or prejudices) lead to the production of unreliable facts to support the belief."

(Seale, 1966)

In the previous chapters I have shown in detail, and I hope conclusively, that the present working conditions in many N.H.S. hospitals are deplorably poor, and that the efficient making and keeping of medical records is being seriously prejudiced as a result. In particular, space and mechanical equipment are sadly lacking, while, at the same time, the magnitude and the complexity of the work load are continually increasing.

The popular notion that, if only we can survive under present conditions for a few more years, third generation electronic digital computers will certainly solve all these problems is attractive but utterly foolish. Before that can happen administrative pragmatism must be replaced by detailed operational research; traditional routines of work and document design must be examined and revised by systems

analysis.

Above all, it must be appreciated that medical practice is unlike any other, and is impossible for a layman to fully comprehend. There will be no place for inter-professional petty jealousies, and the medical profession must have the predominant say in future policies.

APPENDIX

MEDICAL RECORDS RESEARCH GROUP,

University of Glasgow.

December, 1965 to February, 1968.

I N T R O D U C T I O N

In August 1964, Dr. (now Professor) Bernard Lennox of the Pathology Department, Western Infirmary, Glasgow, proposed to the Nuffield Provincial Hospitals Trust that an investigation be made into "methods of production of medical records at the ward and clinic level". As a direct result of these proposals, the Medical Records Research Group was formed in December, 1965.

TERMS OF REFERENCE

1. To consider factors presently affecting the handling and composition of hospital case records in wards and clinics; and to recommend improvements.
2. To consider the present storage of these records after the patient's discharge from hospital; to recommend improvements; and to consider the role of abbreviated and/or computerised medical records.

FINANCE

The Group has been wholly financed by a grant to Professor Lennox from the Nuffield Provincial Hospitals Trust, administered via the Finance Department of Glasgow University.

STAFF

The following were full-time members of the Group for all or part of 1966/67 :-

Director : Dr. J. H. Mitchell.

Research Assistant : Ian B. Laing, A.M.R.,
formerly of the Records
Department, Royal Infirmary,
Glasgow; now Group Medical
Records Officer, Edinburgh
Northern Hospitals.

Senior Secretary : Miss Emmeline M. Thorpe,
formerly of the Medical Department,
British Railways (Scottish Region).

Junior Secretary : Miss Margaret F. Clarke,
now personal secretary to
Professor David Mason, Dental
Hospital, Glasgow.

P R E M I S E S

At the start of the project, temporary accommodation was used in the Western Infirmary. Subsequently, Professor Thomas Anderson generously lent two modern offices in his Department of Epidemiology in Ruchill Hospital for more than a year, until the present premises in University Gardens became available.

THE WORK OF THE GROUP

1. WORK STUDY IN WARDS, CLINICS AND SPECIAL DEPARTMENTS.

In the Western Infirmary, general factors affecting the making and keeping of medical records were studied in two medical and two surgical Units, and in the E.C.G. and X-Ray Departments. Subsequently the Group was invited to recommend measures to improve the secretarial services in the Department of Medicine and the Radio-Isotopes Department: many of these measures have now been adopted, and proposals to alter document design and procedure are still under discussion.

In Stobhill General Hospital, Glasgow, the Group organised two large-scale trials of central dictation equipment, each lasting several weeks; neither manufacturer made any charge for supplying or installing the equipment.

2. RECORD STORAGE.

This has latterly presented acute problems in the Western Infirmary because of lack of space, and the Group has made a prolonged study of the factors involved. Its recommendations (M.R.R.G. Report No. 16) were forwarded by the Medical Records Sub-Committee to the Board of Management, and funds have now been allocated for the Department to be

completely reorganised over a period of several years. A full account is given in a paper in the LANCET (1967), 2, 932, by Mitchell, Laing, Lennox, Goldberg and White, entitled "Summaries and Selective Destruction as a Solution to the Hospital Record Storage Problem".

3. CORRESPONDENCE.

A great deal of information and opinion is being continually exchanged by letter with individuals and research organisations, both in the United Kingdom and overseas. This has resulted in personal visits to the Group by various people, including :-

Mr. W. Bain,

Staff Officer, Scottish Hospital Administrative
Staffs Committee, Edinburgh.

Mr. J. K. Bates,

Modern Records Officer, Scottish Record
Office, Edinburgh.

Professor Hugh Dudley,

Department of Surgery, Monash Medical School,
Prahran, Victoria, Australia.

Dr. M. A. Heasman,

Director, Research and Intelligence Unit,
Scottish Home and Health Department,
Edinburgh.

Dr. K. G. Howsam,

Medical Director, Royal Victoria Eye and Ear
Hospital, Melbourne, Victoria,
Australia.

Mr. W. H. Kincaid,

Associate Director, Commission on Professional
and Hospital Activities,
Ann Arbor, Michigan, U.S.A.

Dr. Stephen Mackenzie,

Deputy Senior Administrative Medical
Officer, N.W. Metropolitan Regional Hospital
Board, London.

Professor Fraser Ross,

Dept. of Social Medicine,
Harari Teaching Hospital,
Salisbury, Rhodesia.

4. VISITS ELSEWHERE.

Since December 1965, one or more members of the Group
have visited the following :-

Aberdeen University (Department of Public Health).

Addenbrooke's New Hospital, Cambridge.

British Aircraft Corporation (B.A.C. One-Eleven
assembly line), Hurn Airport,
Christchurch.

British Medical Association (Department of Audio-
Visual Communication),
London.

British Rail (Scottish Region H.Q.), Glasgow.

Cottage Hospital, Campbeltown, Argyllshire.

Dounreay Experimental Reactor Establishment,
Dounreay, Thurso,
Caithness.

Exeter University (Community Health Research Project).

Guy's Hospital (General Practice Research Unit),
London..

House of Lords (Record Office), London.

J. & P. Coats (U.K.) Ltd., (Head Office), Glasgow.

Law Hospital (E.C.G. and Records Departments),
Carlisle, Lanarkshire.

New Scotland Yard, (Criminal Record Office),
London..

N.W. Metropolitan Regional Hospital Board H.Q.,
London.

Pembroke County War Memorial Hospital,
Haverfordwest, Pembrokeshire..

Queen Elizabeth II Hospital, Welwyn Garden City,
Herts.

Royal College of Physicians & Surgeons (Library),
Glasgow.

Royal Infirmary (E.C.G. Department), Glasgow.

Royal Infirmary (Records Department), Greenock.

St. Luke's Hospital, Guildford, Surrey..

Scottish Hospital Centre, Edinburgh..

Scottish Record Office, Edinburgh.

South of Scotland Electricity Board H.Q., Glasgow.

Southern General Hospital (Accident & Records
Departments), Glasgow..

The London Clinic, London..

U. S. Air Force 48th Tactical Hospital,
Lakenheath, Suffolk..

Vale of Leven Hospital, Alexandria, Dunbartonshire..

Victoria Hospital (Out-Patient & Records Departments),
Kirkcaldy, Fife..

West Cumberland Hospital (Records Department),
Whitehaven.

West Wales Hospital, Carmarthen.

Westminster Hospital (Pharmacy Department), London.

Withybush Hospital, Haverfordwest, Pembrokeshire.

5. COOPERATION IN OTHER PROJECTS

(a) A data processing service of medical records was begun in Glasgow Northern Hospitals in 1967, using 80-column punch cards to record information about every in-patient. The Group has maintained a keen interest in the planning of this service, and has given help in document design.

(b) The out-patient service for obstetric and gynaecology patients has recently been expanded in Robroyston Hospital, Glasgow, and the Group has helped with advice about secretarial requirements.

(c) The Group has arranged with the Department of Industrial Administration, University of Strathclyde, Glasgow, for numerous students to undertake work surveys in Stobhill Hospital, and in the Vale of Leven Hospital, Alexandria, Dunbartonshire.

(d) Dr. Mitchell and Mr. Laing have been members of the Medical Records Sub-Committee of the Western Infirmary.

(e) Dr. Mitchell is a Founder Member and a Full Member of the Institution of Computer Sciences, London, which was officially inaugurated in 1967.

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(including dates first published)

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2. "Survey of Dr. Richards' Unit, Western Infirmary" :
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3. "Survey of Professor Wayne's Unit, Western Infirmary" :
April, 1966.
4. "A Labelling Service" : notes on the resulting saving
in a clinician's time" : April, 1966..
5. "The Professional Activity Study" : an edited script of
a lecture given in the Western
Infirmary by Mr. W. H. Kincaid :
May, 1966..
6. "Survey of the X-Ray Department, Western Infirmary" :
June, 1966..
7. "Survey of Mr. Clark's Unit, Western Infirmary" :
June, 1966.
8. "A Hospital Messenger Service" : report of a trial
project in the Western Infirmary :
July, 1966..
9. "The Retention and Storage of Hospital Medical Records" :
a paper for discussion: August, 1966..
10. "Weeding Medical Records" : a pilot experiment:
September, 1966..
11. "The Retention and Storage of Hospital Medical Records" :
a report of a symposium in the
Western Infirmary, organised by
the Group: October, 1966..
12. "Hospital Medical Records: the Case for Retention" :
a paper delivered by Dr. Mitchell
to the Conference of the Association
of Medical Records Officers in
Glasgow: November, 1966..

13. "How Many Folders?" : some comments on two designs
of hospital case records in S.W. Wales:
November, 1966.
14. "Survey of Professor Kay's Unit, Western Infirmary" :
August, 1966.
15. "Medical Records: their Storage" : December, 1966.
16. "Making More Space" : an account of a pilot trial in
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17. "The Discharge Letter as a Case Summary" : February, 1967.
18. "How Useful are the Letters?" : an account of a
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March, 1967.
19. "Telephone Dictation in Clinics" : comments on two
trials in Stobhill General Hospital in
1966: April, 1967.
20. "Robroyston Hospital Ante-Natal Clinic" : an enquiry
into the clerical services: April, 1967.
21. "How Many Secretaries?" : an investigation in the
Department of Medicine, Western
Infirmary: June, 1967.
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