

DOMICILIARY PHYSIOTHERAPY;
COST AND BENEFIT

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SUMMARY

This report describing the study of domiciliary physiotherapy within the South Birmingham Health District covers the period August 1977 to December 1980 inclusive, when six hundred patients completed a course of physiotherapy treatment. Related investigations, involving a further four hundred and eighty-eight patients, are described, including the developments in the service during 1980.

The aim of the study was to evaluate a domiciliary physiotherapy service in terms of its effectiveness, the costs involved, to relate these costs to output, and to determine whether there were particular client groups for whom such a service would be most suitable.

Patients were assigned to one of three groups; domiciliary treatment group, hospital based treatment group, and no treatment group. Assessments, questionnaires, content analysis, VTR and various physical measurements were used in the investigation.

Results obtained during the course of the study show that physiotherapy treatment in the patient's home is generally as effective as that given in the hospital physiotherapy department. For certain groups of patients the costs incurred in a domiciliary physiotherapy treatment were similar to those incurred in a hospital based treatment, although patients requiring ambulance transport for treatment cost three times as much as the equivalent domiciliary treatment.

This study has demonstrated that a domiciliary physiotherapy service is a cost effective way of providing a physiotherapy service to certain groups of patients, the elderly, the young chronic sick, the terminally ill who wish to remain at home, certain orthopaedic post-operative patients and patients who have suffered a cerebral vascular accident. It has also been shown that minimal support to relatives has been instrumental in keeping the patient at home and out of the hospital.

Key Words:

Domiciliary

Physiotherapy

Cost

Benefit

Community

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DOMICILIARY PHYSIOTHERAPY:

Cost and Benefit

CHAPTER I

Introduction, Study Outline,

And Background Detail

INTRODUCTION

This work is the outcome of a study undertaken within the South Birmingham Health District, to determine the cost of a domiciliary physiotherapy service and to evaluate the benefit of such a service. The project resulted from a request to the author, in his capacity as District Physiotherapist, by the South Birmingham Health Care Planning Team for the Elderly, to suggest measures which might improve the physiotherapy service to patients aged sixty-five and above.

The project commenced in March 1977 with a pilot study, the main study beginning in August 1977. Between that date and April 1979 a sample of 200 patients was studied and a report issued, Frazer (1979). Subsequently a second sample of 200 patients was studied and a second report issued, Frazer (1979). A third sample of 200 was used as a check for the two initial samples to determine how representative they were of the need within the community for a physiotherapy service of this kind. The report "Evaluation of a domiciliary physiotherapy service to the elderly", Frazer (1979), was based on these samples.

Within these samples there was a significant number of patients referred who were under the age of 65 and the percentage of these patients has increased from 4.5% in the initial sample of 200 patients, 12.5% in the second sample, to 20.5% in the third sample of 200 patients. Although the study began as a result of a request from the team devoted to the care of the elderly, it became evident that there were certain groups of younger patients within the community who might benefit from a domiciliary physiotherapy service.

In order to evaluate a service to the younger age group, a secondary study was carried out in 1980 on 47 patients based on the structure of the main study with a number of major differences. The assessments were all performed by the consultant surgeon who referred the patients. The conditions referred were limited to acute spinal dysfunction; there were three separate groups of patients who received treatment as shown in Fig. 2, page 4. The main criterion of success was the return to work following treatment of the patient.

The consumer sovereignty approach to treatment valuation was tested in a further, separate sample of 400 patients and was also used in the sample mentioned above. The usefulness of this method is discussed at a later stage in the report. Two other studies arising from the main study investigate the nature of the patient-physiotherapist interaction and it will be seen that the results from the observation of a total of 1088 patients have contributed to the main study. Owing to the nature of the study and the time scale involved, this report presents the findings in two parts based on the chronological evolution of the study. The first part of the report describes the original results and includes a description of the most recent extensions and developments within the service resulting from the report (Frazer 1979)(a) on pages 78 - 130.

The table overleaf outlines the dates involved in the study together with the significant features of the various samples and the page numbers of their description in the text.

CHRONOLOGICAL EVOLUTION OF THE STUDY

Pilot Study

Commenced 8 March 1977 and completed by 30 June 1977.
Pages 33 - 44.

Study Of First Sample Of 200 Patients

Commenced August 1977 until August 1978.
Pages 78 - 130: Comparison of domiciliary treatment with
hospital and no treatment groups.

Study Of Second Sample of 200 Patients

Commenced August 1977 until March 1979.
Pages 134 - 174 : Similar to the first two samples.

Study Of Third Sample of 200 Patients (Presenting Sample)

Commenced March 1979
Pages 174 - 179 : All domiciliary patients.

Study Of 400 Patients To Determine Method Of Treatment Valuation

Carried out July/August 1980, published November 1980.
Pages 198 - 207.

Study Of 40 Patients To Determine Physiological Changes
Occuring In The Patient During A Physiotherapy Treatment.

Pages 367 - 389.

Study Of 47 Young Orthopaedic Patients

Pages 209 - 224 : To determine cost effectiveness of physio-
therapy treatment in hospital with
domiciliary and no treatment groups.

Study Of Patient Staff Interaction (1 Patient, 10 Staff)

Pages 338 - 366 : To determine the types of interaction
occurring within a physiotherapy treatment
and the effect of the physiotherapist's
personality on a treatment.

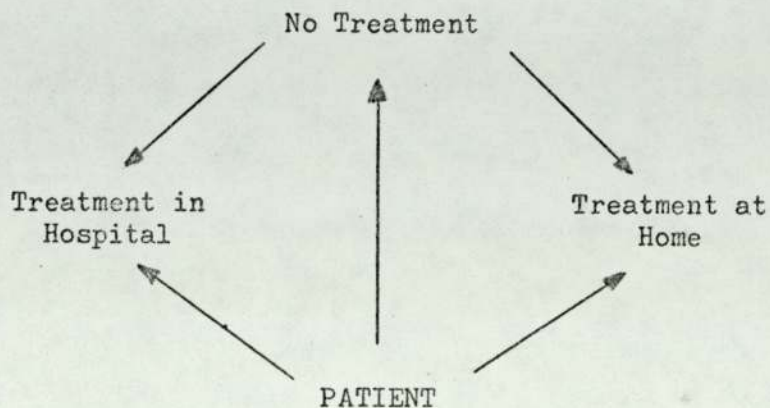


FIG. 2

This fig. illustrates the study design which is constructed to produce three groups of patients. When a patient is referred to the study they are randomly assigned to one of the three groups shown. Group 1 patients are treated in the home. Group 2 patients are treated in the physiotherapy department and Group 3 patients receive no treatment for a period of three weeks. Following this waiting period they are then randomly re-assigned to either Group 1 or 2. This method is more fully discussed on pages 26 - 28.

Preface

Comparatively little work has been undertaken with regard to the cost-effectiveness assessment of medical treatment in general and physiotherapy treatment in particular. A report from the Health Services Research Unit of the University of Kent, Partridge and Warren (1977), described the availability of community services in fourteen Health Districts without providing any objective evidence concerning the benefits of such a service.

In view of the need for information of this nature and with the assistance of the West Midlands Regional Research Committee and of the South Birmingham Health District, this study was commenced.

In the early stages of planning the study it was considered inadvisable to attempt to measure the effect of physiotherapy treatment as it represents a considerable task. It was clear, however, that any effective valuation of the service must include some measure of outcome of treatment. Alan Williams (1975), states that any formula of efficiency must cost the true unit of output or achievement and, the measurement of costs must range over all resources or inputs. Thus it is not enough to identify a patient caseload and to compute the total cost of the service provided as there must also be some measurement of the output achieved.

There are considerable difficulties in deciding what are appropriate indicators of output and in determining how they will be measured. In the case of the younger patients it is clearly easier to decide upon criteria for assessment purpose such as time off work, or the time taken to return to work following a course of physiotherapy treatment. These types of measurement are easy to apply and can be readily compared with 'no treatment' groups as can be seen in the example given in the second part of this report on pages 209 - 224.

In the case of the elderly patient, it is much more difficult to measure achievement, as many of the results of treatment are concerned with and improvement in the quality of life or the ability to cope, rather than in any significant change in physical condition.

For the purpose of this study the measurements chosen were subject to a number of constraints. Firstly, there were no funds available to produce detailed and extensive assessment sheets. Secondly, any assessments used required to be quick to complete as the General Practitioner, who is assisting in the assessment procedure, is usually so busy that he has little time available to complete the elaborate assessments.

It was decided initially to include the General Practitioner in the assessment of the patient to reduce observer bias. Previous experience of working with GP's in the South Birmingham Health District, Muller (1976), showed that their response rate to a number of detailed questionnaires was less than 40%. For the purpose of this study it was considered advisable that any assessment to be completed by the GP should be quick and easy to complete, while at the same time, should show accurately changes in the physical condition of the patient and produce consistently reliable results which could be validated by other methods.

With these constraints in mind the PHYSIO assessment form was designed, Frazer (1978)(b), and this is described in detail in the chapter on 'Measurements'. There is a high degree of agreement between GP and physiotherapists in the independent use of this assessment, as shown in the correlation score on page 41. This form, along with other measurements used in the study, is shown in Appendix 1, page 250.

As back-up to the GP assessment each physiotherapist carried out the final assessment on her colleagues patients to avoid possible bias in the assessment procedure. This method of assessment has been subsequently used by the Department of Geriatric Medicine in a



Plate 1

This old lady was referred with a contracture of the left knee, with a flexion deformity of 90° . She was confined to her wheelchair and her movement within the home was restricted to her using her sound leg to propel the wheelchair backwards and forwards across the small living room. She was taking three separate drugs, often in the wrong combinations and was depressed and confused. Her daughter was out at work all day and she was left sandwiches and a flask. There was little that the physiotherapist could do for her and she was referred to the geriatric day hospital.

study currently in progress. The advisability of such a back-up method was clearly underlined when the first four hundred patients were analysed and it was found that the rate of response for the GP assessment was 53% in the case of the first 200 patients and had fallen to 46% in the second part of the cohort.

General Background To The Study

Williamson (1966), mentions an 'iceberg of unreported illness' stating that many older people do not consult their doctor when ill, in particular when the problem involved painful feet, difficulty with walking, problems of micturition, anaemia and dementia. This statement is partly supported by the findings in the current study where 28% of the sample were referred by some agency other than the doctor.

Major disability which causes a patient to be unable to lead an independent existence increases dramatically with age. By the age of 85, eighty per cent of people suffer from such a disability, Akhtar (1973). It has also been reported, Andrews et al (1971), that many of the conditions discovered in the elderly are remediable. There has been a decline in family support for the elderly, largely as a result of a fall of 19% in the birthrate between the wars which reduced the potential number of middle-aged children available to support elderly patients, Grimley-Evans (1977).

There has also been a dramatic increase in the number of women engaged in full-time occupations which further reduces support for the elderly (see Plate 1, on page 7. The utilisation of health and welfare services is a function of age, it is estimated that the older adults avail themselves of these services at a rate of about $2\frac{1}{2}$ -3 times greater than the general population, DHSS (1974)(a).

In a paper entitled: 'The problems of a rehabilitation service', Sharman (1972), it was stated that in this country inadequate remedial services do not excite doctors, politicians or the authorities. An inadequate rehabilitation service merely passes on its unfinished business, those concerned becoming problems for the Social Services departments, or swallowed up in the community and forgotten, becoming statistics in the latest report on the handicapped and impaired in Great Britain.

In 1971 a Southampton physiotherapist was given approval to undertake a six month trial of community physiotherapy, concentrating on the treatment of children, Compton (1973)(a). In April 1973, a working party set up by the Chartered Society of Physiotherapy to review the need for community physiotherapy, set out to consider how such a service could be provided. Advice was obtained from existing mobile physiotherapy services and from the Royal College of General Practitioners.

An interim report in October of that year, the working party stated that there was a great need for a non-hospital physiotherapy service. Wilkes (1975), stated that there was a tremendous and genuine need for physiotherapists in the community. In his paper he compared the standard of care that existed in the hospital with that in the community, concluding that after twenty-five years of a National Health Service the concentration of care in a mainly hospital-based service, had produced a levelling-up of the standards of hospital care without any levelling-up of standards within the community. The result was that care tended to be worst where the need was greatest.

The Chartered Society Working Party in 1974 reported a lack of factual information on the deployment of physiotherapy in the community and stated that there was a need for comprehensive research in this area,

suggesting that it be carried out by full-time personnel in order to assist planning of immediate and long-term community services. The same document suggested that such services should include education, prophylactic assessment and treatment for acute conditions, with long term support if necessary. The Royal Commission (1976), pointed out that there are no universally acceptable criteria for deciding the best use of National Health Service resources.

The Birmingham Area Health Authority discussion paper on Area Strategy (1977)(a), stated that in setting criteria for planning it is considered important to examine cost proposals in relation to resource availability. The document mentions the system of 'joint funding' as a likely source of monies to facilitate development in priority care groups. It is from joint funding that the money to employ three physiotherapists within the South Birmingham Health District as community staff was obtained. The same document suggested that the main emphasis of development of primary care services be placed on manpower rather than on buildings. A 6% increase annually, in respect of health visiting and home nursing was envisaged as necessary to meet the needs of the 'at risk' child and the elderly. The West Midlands document, 'Priorities for Health and Personal Social Services' (1976), stated that an increase of expenditure of 3.2% would be necessary to maintain services to the elderly and that achievement of this would require a comprehensive review of general hospital services, with an attempt at 'low-cost' solutions such as re-deployment made where possible. The same paper, in the section on community care, suggest that primary teams be developed in order to allow for increased workload, due to greater numbers of old people, and to reduce demands on hospital services. Mention was made of the need to monitor cost-effectiveness of primary care services but little is said how this is to be achieved.

It is in this area of cost effectiveness that this study of community physiotherapy is intended to be of value and for the purpose of this study evaluation is defined as the appraisal of alternative courses of action. The three courses of action considered in this report are; the provision of treatment within the home, the provision of treatment only in the physiotherapy department or the denial of physiotherapy treatment in either venue. As to what constitutes the 'best' must on occasions involve value judgements although this study seeks to base its appraisal on economic measures.

As a result of the study, it is hoped that a standardised and consistent basis for financial allocation needed for a domiciliary physiotherapy service can be provided.

Demographic Background

The relative increase in the number of elderly persons expected between 1973 and 1993 was estimated as follows:

5.6% growth in those aged 60+

26.6% growth in those aged 75+

42.2% growth in those aged 85+

Office of Population Census and Surveys, (1974). An updated estimate of the projected elderly population for the year 2001 and the relevant details are shown in the table, overleaf. This table shows that there is in fact a fall in the number of people in the 60-70 age group, while there is a marked increase in the people in the 75-85 and over group.

AGE GROUP	1975	1981	2001	% Change 1975 - 2001
60 - 65	3,178,000	2,931,000	2,735,000	-13.9
65 - 69	2,831,000	2,759,000	2,411,000	-14.8
70 - 74	2,213,000	2,345,000	2,137,000	- 3.4
75 - 79	1,447,000	1,664,000	1,733,000	+19.8
80 - 84	822,000	936,000	1,075,000	+30.8
85 and over	515,000	550,000	752,000	+46.3
Whole popn. (all ages)	56,043,000	55,911,000	58,345,000	+ 4.1

TABLE 1 : 1975 Projections of the elderly population 1975 - 2001 (UK)
O.P.C.S. 1974



Plate 2

About one third of the patients referred live alone and a large proportion of these have problems of mobility. The key to the house is often placed in an easily accessible place such as under the lino on this mangle. This practice can leave the patient in a vulnerable position.

These figures give a strong indication of the pattern of future demand on the Health Service, since the morbidity rate rises sharply among the elderly who are, in fact, the largest consumer group for health care, Wilkes (1975). Currently, there are 14.3% of the national population aged sixty-five or over, although the population of the West Midlands is younger with 12.2% in this age group.

Clinical experience suggests that these projected increased numbers of elderly persons will include a significant proportion who will be liable to sudden illness or crises of dependency with consequent immobility, problems such as arthritis, fractured femur, cardio-respiratory failure and paralysis of various kinds.

The Need for Domiciliary Treatment

There is usually a multiplicity of pathological processes present in the elderly, Caird (1976), although the presenting diagnosis is usually one which includes a functional deficiency. In such cases there is need to study the patient's functional capabilities in terms of activities of daily living. Specific study of many of these functions in an environment which is as realistic as possible is essential before a rational treatment plan can be prepared.

The elderly patient is often affected by problems of balance and walking and it is probable that the patient's home is the ideal place for assessment to be made and for subsequent treatment to be given. There are a number of reasons for this; firstly, the patient's mental state is often a determinant of his functional capabilities, Caird (1976), because of this it is probable that treatment in the familiar surroundings of his own home will be easier for the patient to comprehend. Secondly, the patient's functional difficulties may be linked to either social factors or to his home environment. These social factors will include family and friends, their attitudes,

Pocklington Place,
Hole Lane,
Bristol Road,
Birmingham 31 2AH.

24th November. 1978

My dear Lady Clerk,

I would like you to accept this little tin on biscuits not that I could ever repay you for that day sometime ago when you gave me a cup of coffee and a lovely ham sandwich when I had to wait six hours for the ambulance to fetch me and I cannot walk alone even to get a cup of coffee.

I was taken with pneumonia soon after and did not return. I so often spoke about it to the residents here and now I can thank you in person. My niece is paying for me to come by car as I feel too ill to wait about all day for the ambulance.

With every good wish,

Yours always gratefully,

Myra K. Steele. (Miss)

Myra K Steele

FIG. 3

This letter was written by an eighty year old blind lady, and is reproduced with her permission.

support or lack of support, all of which can be more accurately assessed during a home visit.

It is often necessary to make a direct examination of the patient's home to determine the location of toilet, bed, chairs, hand rails and so on. Any need for social services support such as home help, bath attendant, meals-on-wheels, home laundry service or house alterations can be assessed at the time of the home visit. These factors suggest that a domiciliary service has a value, not only in the actual treatment of the patient, but also in helping to determine the diagnosis, a process which is often protracted in the elderly patient, Caird (1979). The effects of domiciliary treatments are expected to be superior to those which might be expected from attendance at the hospital. This was the opinion of the majority of the general practitioners contacted in the planning stage of the study, many of whom felt that patients in the sixty-five and over age group were too frail to endure the strain of a journey to hospital for out-patient treatment.

Problems With The Ambulance Service

Experience over a period of ten years of the ambulance service has shown that hospital out-patient treatment is often accompanied by long waits for the ambulance, both before and after treatment. The service is also, because of its very nature, variable because the ambulance can be called to an accident or similar emergency, thereby disrupting the service to clinics.

Attendance at out-patient clinic can prove a tiring ordeal for a patient and there are many cases of waiting periods in excess of four hours following treatment before the ambulance returns to take the patient home. A wait of this duration can prove harmful, particularly for the elderly patient, a fact clearly illustrated by the letter from a patient on the previous page.



Plate 3

This photograph shows five of the seven wheelchairs, all purchased by the husband, of a heavily disabled patient.

In spite of the best co-operation of the ambulance service it has not been possible to give a satisfactory service to hospital out-patients. It is understood that a working party is currently examining possible alternatives for the DHSS to minimise this difficulty. In the second week of February 1978, a total of 75 out-patient appointments were cancelled because of staff shortages in the ambulance service. It is invariably the patient, described as the 'two-man' lift who is most frequently cancelled by ambulance control. These patients require two ambulance men to lift them into the ambulance and when there are staff shortages these patients are the first to suffer.

The first indication that the physiotherapy department have, that such a cancellation has occurred, comes when the patient or his relative telephones the office to ask why the ambulance has not arrived. This haphazard method of cancellation causes considerable stress to the patient and to his relatives as they are often unsure whether he will be collected or not on a subsequent appointment.

There are many instances, recorded during the course of the study of patients in their eighties getting up at 4 o'clock in the morning and sitting fully dressed by 7 o'clock waiting for an ambulance which never turned up. Many patients who had been selected as members of the ambulance group in the study were never brought to hospital even once. These patients had to be given their treatment at home. Even when the ambulance service was reliable, the effect of treatment could often be negated by the strain of the ambulance journey, Beer et al (1974).

Treatment in the home is seen as more relevant by the physiotherapist because problems within the home can rarely be effectively duplicated in the hospital physiotherapy department. Problems may not even be recognised as such by the patient and therefore will not be mentioned

on a visit to the out-patient clinic. No treatment given in hospital could be fully successful unless the home problems could be assessed and eradicated.

Study Outline and Provisional Plan

In view of the problem with the ambulance service and with the knowledge that these problems were long standing, it was apparent that some alternative method of providing a physiotherapy service to a patient who was unable to attend the physiotherapy department was required. Reports were received from doctors and district nurses regarding patients in the community who needed physiotherapy but who were unable to attend the physiotherapy department.

The author was aware that certain mobile physiotherapy services did exist largely funded by charitable organizations and when the National Health Service re-organisation was effected in 1974, the author decided to investigate the possibility of providing a domiciliary physiotherapy service within the South Birmingham Health District. An initial approach was made to the appropriate District Officers and it was suggested that the backing of certain consultant medical staff would be required before making a bid in the planned programme for funds. A request was also made for a paper outlining the proposed scheme in detail for circulation throughout the various medical divisions.

A search of the available literature was carried out and a list of this is included in Appendix 2. This led to the production of a paper which originally supported a scheme to cover all age groups. Following discussion with several consultants, the decision was taken to confine the service to the elderly patient because the need was said to be greatest in this group and these patients were most likely to need an ambulance to bring them to hospital for physiotherapy treatment.

Considerable opposition was expressed by a number of consultants who stated that the development of a community service would be detrimental to the hospital service, in one case the author was told to get on with his work in the hospital and not waste time on schemes such as this.

As the service proposed was totally new, it was essential to be able to convince various groups, such as consultants, managers and finance officers, that the service would prove cost-effective and that a valid argument could be presented to justify the diversion of a scarce resource into the community. It was suggested to the author that to obtain funds it would be necessary to demonstrate that such a service did have a value and until this could be shown, no funds would be forthcoming.

In order to demonstrate a value it was necessary to carry out some form of a trial run. As a basis for the proposed service agreement was reached with the District Administrative Team that funds from an unfilled physiotherapy post, elsewhere in the District, could be used to fund the salary of the physiotherapist. However, it was stated that no funds for travelling expenses would be available.

With the guarantee of a physiotherapy post, it was possible to proceed with the preparation of a blueprint for a domiciliary physiotherapy service. This blueprint embodied a number of requirements and systems, thought necessary for the successful operation of such a service, which are discussed below.

Staff Selection

As the physiotherapist engaged would be working entirely with the elderly, it was considered advisable to appoint a person with experience in this specialty as the post would be single-handed and

would involve work in an unfamiliar environment. It was required to appoint a person who could adapt to being a visitor in the patient's home without feeling threatened by the reversal of the familiar clinical environment where the patient is the visitor to the hospital physiotherapy department.

A necessary criterion was the possession of a roadworthy vehicle with appropriate insurance cover. This criterion effectively excludes many otherwise suitable staff who either cannot drive or who do not own a car. A senior physiotherapist who had been working in the geriatric division at Selly Oak Hospital, was selected and initially it was arranged that she should divide her time equally between the hospital wards and the community. This arrangement would enable her to maintain contact with her hospital colleagues and would help to prevent feelings of isolation. It would also allow her to bring the proposed study to the attention of various consultant geriatricians whose support might be instrumental in any proposed development and extension of the domiciliary physiotherapy service.

Patient Referral

Several systems were considered and an open referral was selected. All staff likely to be involved with a patient in the community would have an opportunity to refer him to the scheme. To ensure continuity and to maintain the legal requirement, the general practitioner would be used as the main medical adviser and all referrals which were received from non-medical staff would be confirmed with the patient's own GP. As it was likely that the GP would be asked to assist with the assessment of treatment outcome, it was necessary to involve him closely from the start of the service.

A referral card was designed and printed, with dimensions specifically chosen so that the card would fit into the envelope containing the patient's medical records which is kept in the doctors surgery. The belief was that the convenient size might encourage doctors to use the form. Together with the form a circular letter was prepared to advise doctors of the proposed service. These records are shown in Appendix 1, page 261.

Types of Condition Referred

The original plan was to limit the service solely to patients who had suffered a stroke. This was expected to provide about 120 patients each year and, for the purposes of the study, a sample of 200 was considered necessary, therefore, it was decided to extend the study to include patients with problems of mobility. Finally, it was decided to offer the domiciliary physiotherapy service to all patients aged sixty-five and over, irrespective of the presenting diagnosis.

This final decision was made in order that a retrospective analysis might be made of the effects of physiotherapy treatment upon a wide variety of patients suffering from many different conditions. This analysis might provide an indication regarding the conditions most suitable for domiciliary treatment (as shown on pages 112 and 117).

Assessment Methods

As it was decided to open the service to any physical condition the need for a generalised assessment was identified. The assessment had to be easy to complete, inexpensive, simple yet comprehensive. Owing to these constraints (as mentioned on page 6), elaborate assessments were ruled out and a system of assessment was devised that allowed a degree of flexibility

and was suitable for any condition referred, Frazer (1979)(b). One method used was the PHYSIO assessment card which was based on the system used for medical assessments by both the British and American forces, McNalty (1961). This assessment was designed to be used by both the referring doctor and by the physiotherapist carrying out the treatment. The PHYSIO assessment provides a before and after record of the patient's condition and is fully described in the chapter on measurements, on Page 55.

This assessment was supported by a number of other methods, including the Physiotherapy Grid, the Pain Thermometer, a questionnaire to be completed by the patient and a Social History. Other more specific assessments were to be used when thought necessary, such as vitalograph readings, exercise tolerance tests, walking distance tests, goniometer measurements and dynamometer measurements.

The Physiotherapy Grid, Page 58, was specially adapted from a similar system described by Rosser and Watts (1973) and was designed to measure the functional capacity of the patient along with his subjective feelings of distress associated with his state of health. This grid was designed with the elderly patient in mind as it was required to take account of the likely difficulties regarding the assessment of small changes in physical capacity in old people.

The Pain Thermometer, Page 65, was adapted from a design, described by Hayward (1974), which was used as a visual scale.

As treatment outcomes were expected to affect the patient, some method of determining his attitude to treatment was required and a simple Likert scale type of questionnaire was designed for the patient to complete at the end of his course of treatment.

A Social History questionnaire was designed with a view to helping in the matching of the samples and to provide possible additional material for subsequent analysis.

A full description of all of the assessment methods used in the study is given in the chapter on assessments.

Measurements of Costs

The measurement of costs was expected to be relatively simple as the proposed service was limited to the employment of one physiotherapist. Salary and similar costs could be easily identified, equipment costs were small and, if necessary, some equipment could be borrowed from existing physiotherapy department stock. These measurements are detailed in Chapter II on pages 72 - 75.

A record book was commenced to note details of letter writing and telephone calls and a series of tables were devised in which costs could be listed under three separate headings; cost to supplying authority, cost to consumer and cost to the community.

Measurement of Benefits

It was assumed that benefits could be assessed in a similar fashion to costs although it was appreciated that the majority of the immediately recognisable 'benefits' would be among the so-called 'soft benefits', that is benefits to which monetary values could not be readily assigned.

Before the study commenced, it was decided to concentrate on measuring the costs associated with a domiciliary service as they could be measured in detail. When more experience had been gained it was thought that it might then be possible to develop a system which would enable a similar exercise to be carried out with regard to the benefits obtained from a domiciliary physiotherapy service. This problem is examined in detail in the subsequent chapter which describes the development of the study in the year 1979/1980. Tables, similar to those used to list the costs of the service, were

prepared using three headings, which listed the benefits as 'outcomes'; outcome for supplying authority, outcome for consumer and outcome for the community. In this way 'benefits' were listed as outcomes and would have no financial values attached.

Other Documentation

Other documents were required before the service could begin and included, patient appointment cards, physiotherapy report cards, physiotherapists calling cards, exercise sheets, circular letters to doctors describing the service and ambulance journey record sheets.

All these documents were specially designed and produced for the study, the printing being done by the South Birmingham Health District printing department. Examples of all documents used are shown in the Appendix 1, pages 250 - 279.

Academic Involvement

Following the request for statistical evidence that a domiciliary physiotherapy service would be of value to the District, the author contacted the University of Aston, with a view to registration as a Higher Degree Student, with the proposed study as a subject for a dissertation. On acceptance by the IDH Scheme, permission to embark upon this course and for study leave was requested and granted.

Formulation of Hypothesis

There were a number of experimental hypotheses arising from the study design and these are listed below:

1. Elderly patients who were treated in the hospital physiotherapy department would show a greater improvement in their condition

- when compared with a 'no treatment' group.
2. Elderly patients who were treated in their own homes would show a greater improvement in their condition when compared with a 'no treatment' group.
 3. The level of improvement in the condition of an elderly patient following physiotherapy treatment would be the same irrespective of the treatment venue.
 4. There would be no significant difference in the cost of domiciliary and hospital based physiotherapy treatment.
 5. There is no advantage in the provision of physiotherapy treatment.

Research Design

In order to test the various hypotheses, three alternatives had to be considered:

- a) Treatment carried out entirely within the home.
- b) Treatment carried out entirely within the hospital physiotherapy department.
- c) No treatment.

Any complete comparison must include the three alternatives presented above. The reason for this hinges partly on the nature of the assessments being used in the study and partly on the fact that if the analysis were restricted to the comparison of the two treatment areas it would have to be assumed that all measured improvements were indeed due to the treatment given. This assumption would have to be made without any knowledge of what improvement, if any, would have occurred in the absence of any physiotherapy treatment.

As the measurements used were largely subjective, either on the part of the doctor, the physiotherapist, or the patient, the third group of patients must be included in order to be able to present a statistically acceptable comparison of the first two alternatives.

Although the measurements used are described as subjective, it must be stressed that this subjectivity is based on, in many instances, many years of clinical experience in assessing the physical and psychological condition of the patient. In order to divide the patients in the study into groups it was decided to use a tossed coin to first determine where the patient should be treated and then to decide whether the treatment should begin immediately or following a three-weeks waiting period. This provided three groups of patients, randomly selected:

Group 1 - Treatment at home.

Group 2 - Treatment at the hospital.

Group 3 - No treatment for three weeks.

To test the hypothesis would require a suitably controlled situation and because it is difficult in clinical research to closely match people on more than two or three variables, it was decided to compare groups rather than individuals. As all of the patients would be drawn from the 65 and above age group and would be referred by an outside agency, a tossed coin was regarded as a satisfactory method of random selection.

In the case of the 'no treatment' group, this three week waiting period was selected as being suitable as empirical evidence (Frazer 1979)(c) had suggested that most acute conditions would resolve by about ten days and that a wait of twenty-one days should eliminate the

possibility that resolution might occur whether treatment had been given or not. In the case of chronic illness, a wait of this duration would make little difference in the condition.

The disquiet felt by staff that might have been caused by denying treatment altogether is dispelled by this method, especially when the three week waiting period is compared with the then current waiting list period for physiotherapy out-patient treatment of about three months. The waiting time for an appointment in two of the city's leading private physiotherapy clinics is about three weeks. In cases where it is considered that immediate treatment is essential this is provided and these patients are not included in the statistical analysis.

The patients assigned to the no treatment groups would be assessed on referral but told that there was a three week wait before treatment could commence. On beginning their treatment they would be re-assessed, with a third and final assessment carried out upon completion of the course of treatment. In this way these patients would act as their own control with their physical condition being compared before and after a period of no treatment and a period of treatment.

Involvement of the General Practitioner

It was necessary to become closely involved with the general practitioner as he is the person most closely in contact with patients in the community. His support was essential as this would be a totally new service in the community and it was hoped to be able to have him as a source of referral and to obtain his help in the assessment procedure.

Before the study could begin it was necessary to contact the representatives of the general practitioners in the South Birmingham Health District. The GP representative on the Health Care Planning Team for the Elderly, Dr Normal Smith, was persuaded to co-operate in the propagation of information about the proposed study among his medical colleagues. He produced the names of fellow GP's who were thought likely to co-operate in the proposed study. He then arranged a meeting of general practitioners which was addressed by the author. The aims and outlines of the study were discussed.

General agreement was reached as to which procedures might be most suitable, ethical considerations were discussed, the measurements to be used were examined and amendments were suggested. Following this meeting the amended documents and measurements (Appendix 1), which had been agreed, were printed and distributed to the doctors who had expressed willingness to be involved in the study. Visits were made to their surgeries and contact established with the practice receptionist and with the appropriate district nurse. As there were only thirteen doctors involved at this stage a personal approach was possible which may have been one reason for a relatively trouble-free pilot study.

The doctors involved came from a group of eight practices who met at regular intervals to discuss matters of general clinical

interest. Katz and Menzel (1957) stressed the importance of personal communication for decision making among doctors. The regular meeting of this group of doctors has provided great impetus to the growth of the domiciliary physiotherapy service. Further, the readiness to meet, of these doctors, has brought to their notice this innovatory study and its probable benefit to their patients.

The enthusiasm of this doctor, in this case representing his colleagues on the Health Care Planning Team, has done much to promote the domiciliary physiotherapy service, in particular with regard to the spread of information. The study was given a favourable beginning largely because of the excellent co-operation of the doctors involved.

This was important as an extra burden of assessment was being imposed upon the doctor, both at the beginning of the course of treatment and at the end. This assessment had then to be forwarded to Selly Oak Hospital. The average general practitioner is very busy with little extra time available to the doctor and the significant value of his voluntary co-operation can be appreciated.

Implications of Study

Owing to the fact that domiciliary physiotherapy in the National Health Service, McMillan (1974), had not previously been considered desirable by the DHSS it was intended that the findings of this study would prove valuable in determining the validity of this belief.

At the planning stage of the study it was possible to identify a number of possible implications of the study and these are listed below:

1. A growing number of elderly patients will present increasing demands upon the National Health Service. Some of these patients needs can be met by domiciliary physiotherapy, C.S.P. Working Party Report (1974)(a).
2. The increased emphasis on Primary Health Care, Strategy for Health (1975), reduces capital building developments and releases more funds for primary care staff. As all rehabilitation is labour intensive a study such as this can provide a guide as to the most cost effective deployment of these staff.
3. Domiciliary physiotherapy services are likely to be set up by many Area Health Authorities, Partridge (1977), and this study can provide a useful basis from which such a service can be developed.
4. During the course of the study it might prove possible to identify certain conditions which were most suitable for domiciliary physiotherapy treatment. Similarly, suitable equipment and treatment procedures might be identified which would be important for planning as a guide could be given regarding the purchase of appropriate equipment.
5. Most developments hitherto had been based largely upon subjective evidence. The objective evidence which this study might provide, particularly with regard to costs, would prove valuable to any planning team considering setting up a similar service. Although the sample size was considered relatively small and was drawn from one Health District, the findings

could easily be tested in any other part of the country using similar methods.

6. This project was devoted to an evaluation of a domiciliary physiotherapy service to the elderly patient. The measurements utilised could equally well be applied in an evaluation of a similar service to other age groups.
7. A domiciliary physiotherapy service utilises the help and time of the relatives in the patient's treatment. This has two effects:
 - a) By the use of such help, demand upon National Health service resources can be markedly reduced.
 - b) The involvement of the relatives in the patient's treatment can reduce the number of visits by the physiotherapist and can greatly contribute to the well-being of the patient, Isaacs (1972)(a).

This point was considered an area worthy of future study.

8. The physiotherapy staff involved in the project had expressed a considerable increase in job-satisfaction. Two possible reasons have been identified, Frazer (1978)(d):
 - a) The staff feel as though they are doing the job to the best of their ability, as they are able to devote their full attention to each individual patient.
 - b) There is a greater sense of responsibility in working independently in the community.

This point was considered an area suitable for further study.

9. As a result of this study and any subsequent development of a domiciliary physiotherapy service, it would prove possible to offer access to physiotherapy treatment to a group of patients who previously were denied this facility.

Between the middle of January 1977 and the beginning of March 1977 a number of patients were treated at home in order to prepare the way for the commencement of the pilot study. The pilot study began on the 8th March 1977, continuing until the end of June 1977. The purpose of the pilot study was to evaluate the measurements being used and to prepare the staff involved in the main study for any problems which might arise.

The Pilot Study

The pilot study was based on eight GP practices, situated in the South Birmingham Health District, involving twenty-one doctors and a population of approximately 46,300 patients, 5,033 of these being aged sixty-five years or over, South District Profile (1976).

The clinical work was carried out by Mrs J Burrell, Senior Physiotherapist, who treated all of the patients in their own homes. Owing to an ambulance dispute during the time of the pilot study, it was not possible to use the ambulance service to bring patients to the hospital for physiotherapy treatment. The pilot study, therefore, could not be used to provide a direct comparison between treatment at home and treatment in the hospital. This was not considered too serious at that time, as the main purpose of the pilot study was to identify unforeseen problems and to indicate what measurements would be most suitable for inclusion in the main study. As the general question to be answered, ie, 'whether treatment carried out in the patient's home is as effective as treatment carried out in the hospital physiotherapy department' could not be answered because of the ambulance dispute, the pilot study was used to obtain information concerning the cost and benefit of home treatment.

Subjects

The subjects were both male and female, drawn from patients referred by the general practitioners participating in the study. The ages of the patients treated ranged from 66 years to 98 years, the mean age being 77 years.

The pilot study involved a total of twelve patients, all of whom lived within a distance of five miles from Selly Oak Hospital, the mean distance being two miles.

Selection Criteria

Patients were referred by their general practitioners. A period of treatment was up to twelve weeks duration. Assessment of the patient was made upon referral and again upon completion of the treatment period. Assessments were carried out independently by the referring doctor and by the physiotherapist. Treatment was given as often as was thought necessary by the physiotherapist.

Measurements

The measurements used in the pilot study included the PHYSIO assessment form, the Pain Thermometer, the Patient Subjective assessment and the referral form. It had been intended to use the physiotherapy grid, but the forms had not been printed in time. Copies of the measurements used in both the pilot study and in the main study are shown in the Appendix 1, pages 250-279.

Documentation

This was as simple as possible and included the referral card, which served a dual role, both as a system of referral and as a



Plate 4

The District Nurse calls regularly on this young patient suffering from disseminated sclerosis. The patient has only one sound arm functioning and the nurse was shown how to use pulleys and slings as an aid to muscle strengthening and joint mobility.

method of recording the case history, details of treatment given along with the results of treatment. A copy of this card was left in the patient's home and was intended as a means of communication with any other professional calling on the patient.

The general practitioner, district nurse, geriatric health visitor and others, could be kept informed of the physiotherapists visits and could arrange their own services accordingly. In this way it was thought that the referral card could perform a function, similar to that of the Kardex system, used in hospital.

Social History

A questionnaire was completed for each patient in order to obtain details of their social background together with information about their past medical history.

Method

The patients were referred to the physiotherapy department via a referral card which contained details of the doctor's diagnosis together with a request for physiotherapy treatment. A PHYSIO assessment form accompanied the referral with the doctor's assessment recorded thereon. Mrs J Burrell then visited the patient and made her initial assessment. A course of treatment was given and, on her final visit, Mrs Burrell made her final assessment. The GP was then informed that the treatment course had been completed and he was asked to visit the patient and make his final assessment, which would then be sent to Selly Oak Hospital.

The possible bias inherent in this system was recognised during the course of the pilot study and the method was modified so that

the two persons doing an assessment did so separately and retained them until the end of the treatment course before returning them for filing. In this way the one could not influence the other.

The measurements used in the pilot study are described in detail in the following chapter, and on page 53, describing all of the measurements used during the course of this study.

Cost Benefit Analysis

Owing to the ambulance dispute, a comparison of costs and benefits of hospital and domiciliary physiotherapy treatment could not be attempted. A simple comparison was made, to provide an indication as to the cost of a typical domiciliary treatment which was then compared with a similar hospital based treatment involving an ambulance journey.

In the example used, the cost of a typical domiciliary treatment was estimated by taking the mean cost from a sample of 149 visits made during the pilot study. The case used for purposes of comparison was based on a similar treatment in terms of type and duration, with the likely ambulance cost based on information provided by the West Midlands Ambulance Service. The resulting figure was the probable cost that would have been incurred if the patient had been taken to the hospital physiotherapy department by ambulance for his treatment.

Cost of a Domiciliary Physiotherapy Treatment (mean values)

Average treatment time	45 minutes @ £1.9855/hour	1.49
Average travelling time	20 minutes @ £1.9855/hour	0.66
Average distance	6.6 miles return @ 14.7p/mile	0.97
Incidental costs: stationery, clerical, etc.		<u>0.06</u>
		<u><u>3.18</u></u>

FIG. 4

Cost of a treatment using ambulance service (estimate)

Average treatment time	45 minutes at £1.9855/hour	1.49
Average distance, 6.6 miles return	at £1.20/mile	7.92
Incidental costs		0.06
		<u>9.47</u>

FIG. 5

As can be seen, the cost of a domiciliary physiotherapy treatment if the ambulance costs are discounted, is roughly twice the cost of a hospital based treatment, using the mean values shown. Although this is the case for a single treatment estimated from mean values, it was found that the costs of both treatment venues even out over the course of a treatment period, the reasons for this will be discussed at a later stage.

Results: Pilot Study

Twelve patients were treated, three men and nine women, the number of treatments carried out on each patient ranged from one to twenty-five, the average number of treatments being 12.4. Seven of the patients treated showed clinical improvement and expressed themselves as 'much better'. Two patients showed slight clinical improvement, rating themselves as 'slightly better', while the three remaining patients showed no clinical improvement and rated themselves as 'no better'.

The results are shown in the table below which lists the age, sex, diagnosis, number of treatments given and the result of the treatment course, for each patient.

Table 2TABLE SHOWING PILOT STUDY RESULTS (March-June 1977)

Patient	Age	Sex	Diagnosis	Number of Treatments	Result of Treatment
1	78	F	Severe OA, right hip	14	No change
2	80	M	Chronic Bronchitis, pain	1	Slight Improvement
3	76	F	Severe RA, bronchitis	13	Much Improved
4	66	F	Bronchiectasis	13	Slight Improvement
5	66	M	R.CVA, Hypertensive, Diabetic	12	Much Improved
6	75	F	L.CVA, unable to walk	9	Much Improved
7	78	F	Severe RA	17	Much Improved
8	98	M	OA right hip, Spondylitis	11	Much Improved
9	82	F	Subluxation, OA R.Knee, Blind	4	No change
10	71	F	OA right hip, awaiting op.	25	No change
11	67	F	RA, waiting knee arthroplasty	15	Much Improved
12	82	F	Pain right shoulder, UTI	15	Much Improved



Plate 5

Another example of co-operation between the District Nurse and the domiciliary physiotherapist. Here a patient suffering from motor neurone disease, Hodgkins disease and two recent strokes is given sling exercises.

DISCUSSION

The pilot study was primarily designed to test the method of referral, the measurements being used and, to establish a standardised approach to assessment and procedure for each patient.

The separate assessments of the doctor and the physiotherapist were compared and the degree of correlation between their independent assessments was r_s 0.768, $P < .01$, using the Spearman Rank Order Correlation. This clinical agreement was closely matched by the patients' subjective assessment of the effect of their treatment.

The high correlation between the two assessors was, at this stage, encouraging and it was assumed that the PHYSIO assessment, as described on pages 55-58, was an acceptable method of assessment for use in the main study. The assessment procedure had been changed during the course of the pilot study in order to eliminate any possibility of bias. The two assessors keeping their assessments until the end of the treatment period and then sending them to Selly Oak Hospital for filing.

Of the small sample of twelve patients treated during the pilot study, nine showed measurable improvement in their condition. This suggested that there might be a benefit from domiciliary physiotherapy. This assumption was supported by the opinions of the general practitioners and by the district nurse who felt that many patients in the age group treated would have been unable to come to hospital for physiotherapy treatment, as shown in Plate 5, page 40.

This suggested that patients in this age group, in the community, were being denied the opportunity to receive physiotherapy treatment. The conditions presented by the twelve patients in the sample studied included: two 'strokes', three chest conditions, four osteo-arthritic conditions, three rheumatoid arthritis conditions, one of whom suffered from bronchitis and one patient with shoulder pain following a fall.

This last patient was interesting as she had been confined to bed following her fall and had developed a urinary tract infection. This latter case is typical of the elderly patient, many of whom suffer from more than one pathological condition, one often being caused by another, as in this case. As can be seen in the table, many of the patients had more than one presenting diagnosis and the experience gained during the pilot study was of value as it enabled staff to develop confidence in dealing with such patients in their own homes.

It was discovered that interferential therapy was an effective way of treating patients with osteo-arthritic joint conditions as described in Appendix 7, p.307. It was also observed that certain conditions could not be treated so effectively at home, notably osteo-arthritic conditions of the hip. The value of the presence of the relatives during the physiotherapy treatment was noted.

Exercise sheets were prepared and given to the relatives who also received instruction in how to help deal with the patient. All of these points were demonstrated during the course of the pilot study. A further important benefit of the pilot study was the development of a rapport with the general practitioner and with the district nurse. The significance of this cannot be overstressed. It may be stated that without the co-operation of these staff domiciliary physiotherapy could not exist for long.

This was confirmed by the experience of another Health District where the domiciliary physiotherapy service failed to develop because of poor co-operation between the GP, district nurse and physiotherapy staff. It was found that a circular letter to the GP was required to remind him to call and carry out his final assessment as it had been noted that many GP's are reluctant to spend much time writing

assessments. This reluctance was initially confined to a percentage of the doctors which was sufficiently high to justify the preparation of a reminder letter.

RESULT OF PILOT STUDY

The major development resulting from the pilot study was the allocation of funds to allow the employment of three physiotherapists. These staff were to be employed solely in the domiciliary physiotherapy service with the funds allocated out of a joint-funding exercise. This was money available for services to the elderly in the community in Birmingham and provided jointly by Social Services and the Health Centre.

The extra staff allowed a more efficient planning of the domiciliary physiotherapy service. The area covered within the South Birmingham Health District is large, eighty square miles, which could be subdivided each section having its own physiotherapist living within it. In this way travelling could be reduced. The service should also become more efficient when more patients are referred, provided the number of referrals are contained within the available resources, since travelling distances are reduced between patients and the physiotherapist could plan her journey by the most efficient route.

There is a limit to the number of calls the physiotherapist can make in one day. This number was found to vary with the type of conditions referred and was also influenced by the age group. The number of calls possible could range between five and nine in one day. There was obviously a limit to the number of referrals that the three physiotherapists could handle in one day and it was expected that this study would enable management to cost accurately the provision of a domiciliary physiotherapy service by choosing the best mix of inputs to provide a given level of service.

During the period following the completion of the pilot study preparations were made for the commencement of the main study. Two additional physiotherapists were appointed, Mrs S Rollason and Miss G Brown. A third physiotherapist, Mrs L Ankcorn, shared her time between the physiotherapy department at Selly Oak Hospital and the domiciliary physiotherapy service. The physiotherapists and their districts are shown on Maps on the following pages.

Preparation for the Main Study

Following the appointment of the additional staff to the community physiotherapy service, it was necessary to publicise the service to the remainder of the general practitioners within the South Birmingham Health District in order to broaden the scope of the study. This was carried out in the following ways:

1. A letter was sent to all of the doctors outlining the project, enclosing a selection of the various forms to be used and inviting their participation.
2. Meetings were held with the GP community representative, the Community Administrator, the District Nurse representative and the District Community Physician.
3. A series of talks were given illustrated with slides to Doctors, District Nurses and Health Visitors.
4. A report on the pilot study was sent to the Area Medical Officer, the Regional Board Research Committee and the Department of Health and Social Security.
5. Lectures were given to medical students about the project.
6. Invitations to talk about the project to various audiences including research groups, hospital nurses, other health service workers were accepted.

BIRMINGHAM METROPOLITAN DISTRICT

FIG. 6

Showing existing wards and existing health districts.

CODE: North
East
Central
South
West



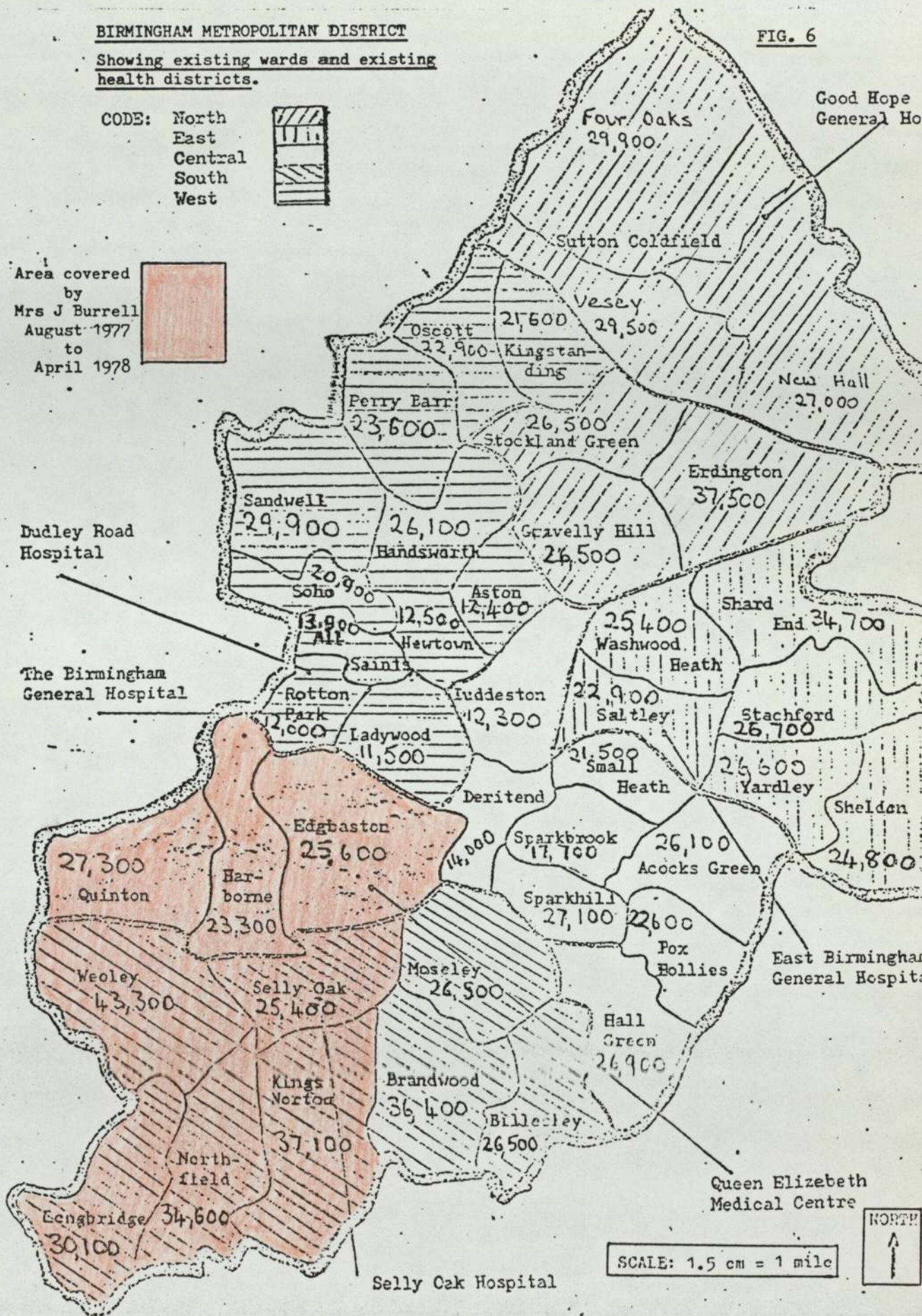
Area covered by Mrs J Burrell August 1977 to April 1978



Dudley Road Hospital

The Birmingham General Hospital

Good Hope General Ho



Queen Elizabeth Medical Centre

SCALE: 1.5 cm = 1 mile



Selly Oak Hospital

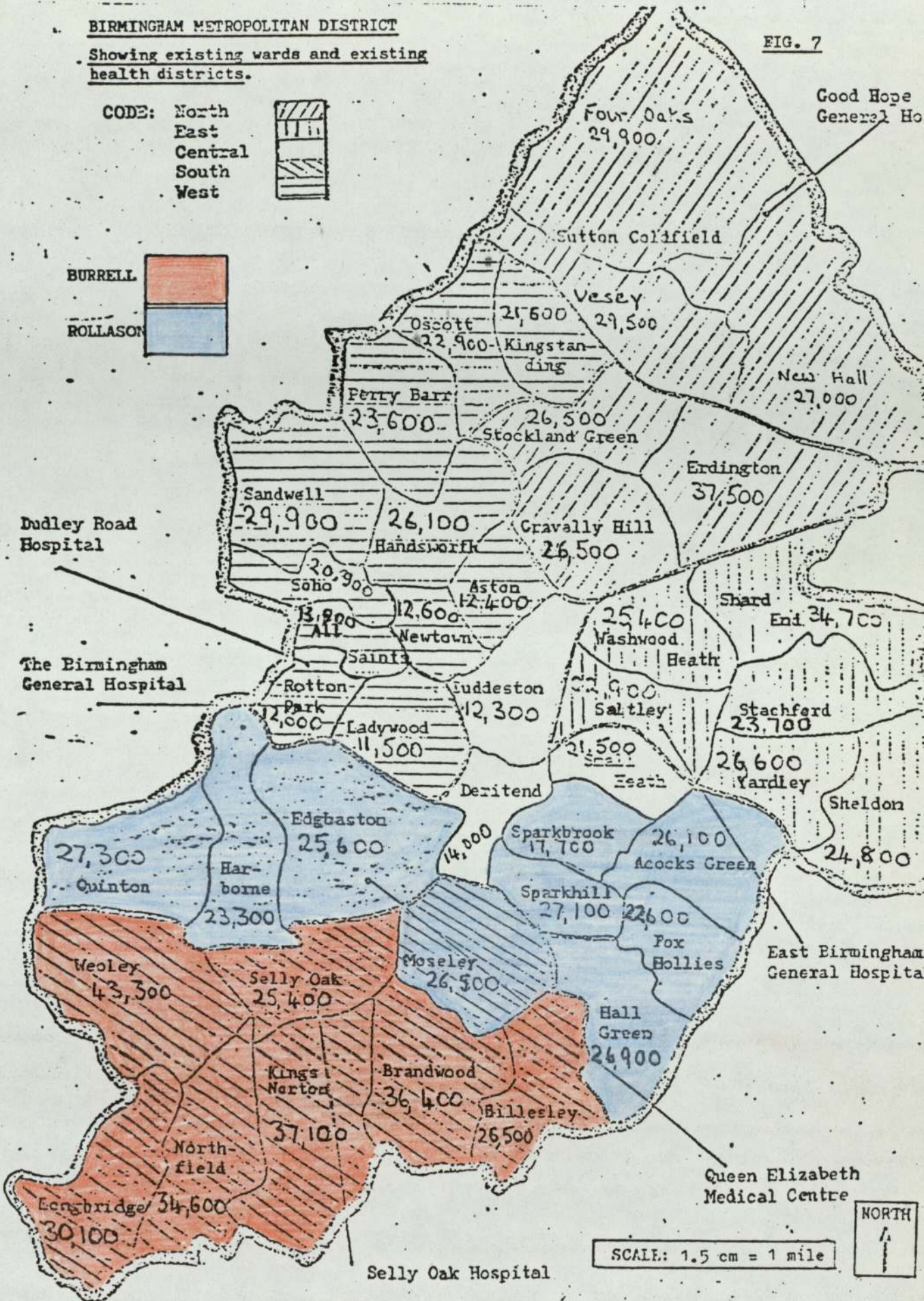
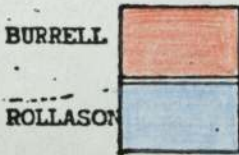
Source: City of Birmingham Central Statistical (1978) estimates

BIRMINGHAM METROPOLITAN DISTRICT

Showing existing wards and existing health districts.

FIG. 7

CODE: North
East
Central
South
West



Source: City of Birmingham Central Statistical (1978) estimates

BIRMINGHAM METROPOLITAN DISTRICT

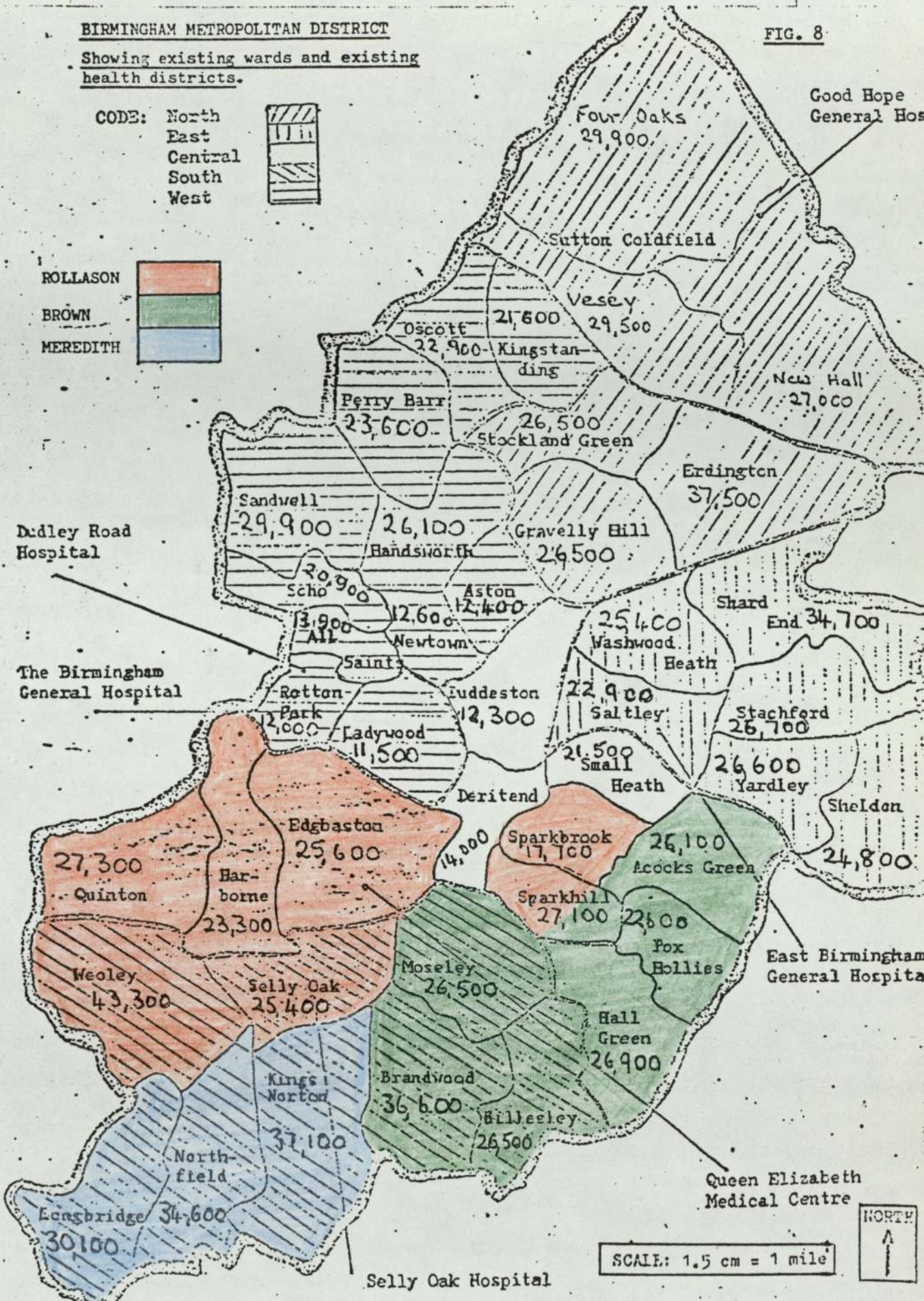
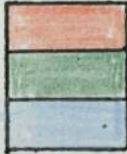
FIG. 8

Showing existing wards and existing health districts.

CODE: North
East
Central
South
West



ROLLASON
BROWN
MEREDITH



Source: City of Birmingham Central Statistical (1978) estimates

BIRMINGHAM METROPOLITAN DISTRICT

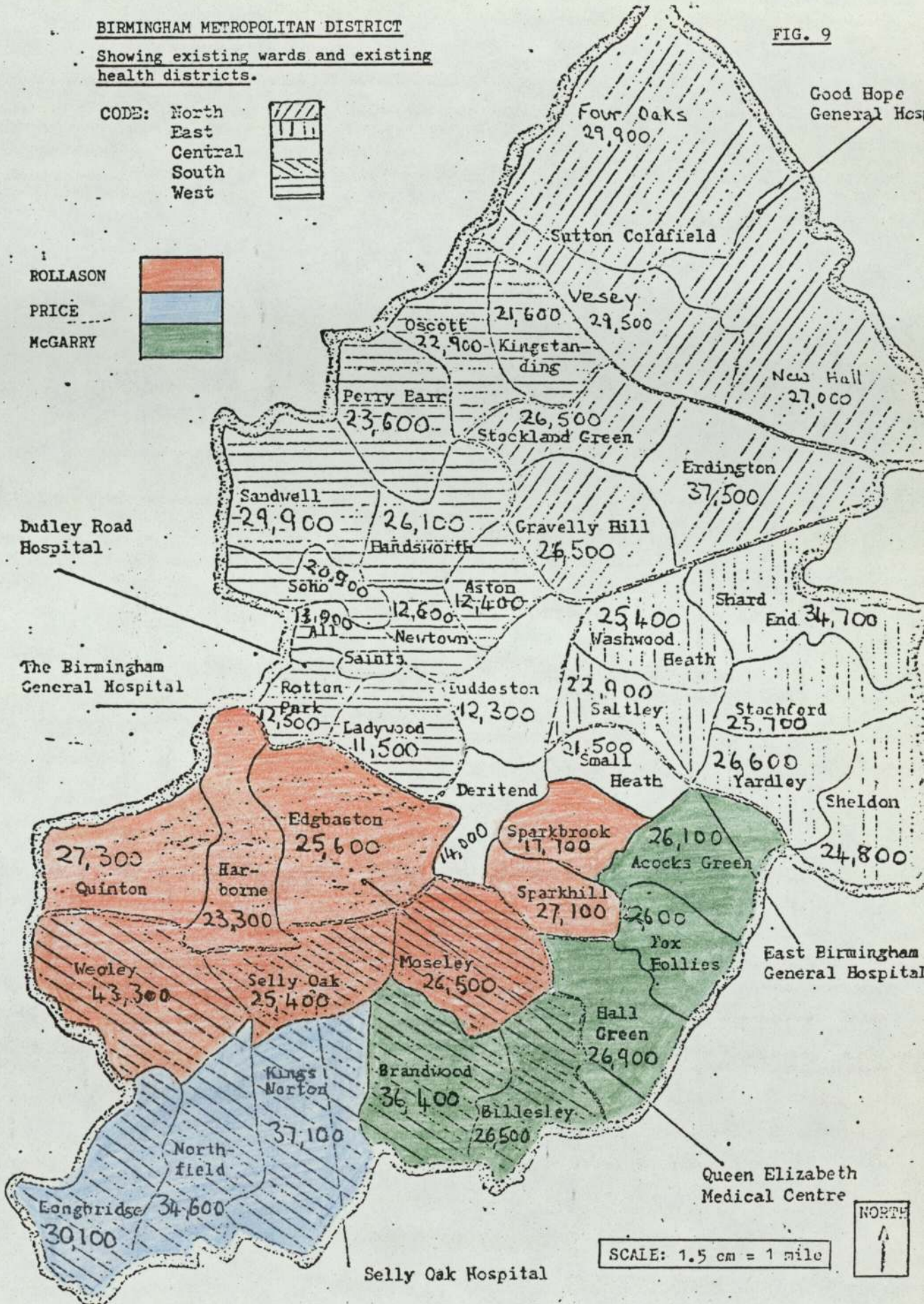
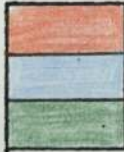
FIG. 9

Showing existing wards and existing health districts.

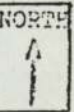
CODE: North
East
Central
South
West



ROLLASON
PRICE
McGARRY



SCALE: 1.5 cm = 1 mile



Source: City of Birmingham Central Statistical (1978) estimates

7. The local press publicised the project as well as certain medical papers.
8. Papers on the project, or on certain aspects of it, were published in the Nursing Mirror, Therapy and the Journal of the Chartered Society of Physiotherapy.

A list of these publications is included in the appendices, page 411.

In these ways the widest audience was reached with a view to helping to publicise the project and stimulating discussion about it in as many areas as possible.

The District Community Physician, Dr Colin Porteous, was extremely influential in furthering the domiciliary physiotherapy service as he was the link with the District Management Team and he was responsible for recommending that the joint-funding monies should be used to employ the three additional physiotherapists for the service.

A map of the area currently covered by the domiciliary physiotherapy service is on page 48. As can be seen, the South Birmingham Health District domiciliary staff provide a considerable service to part of the Central Health District. The main reason is that the two health districts overlap in the provision of a service to the elderly patient, the bulk of the service being provided by the South Birmingham Health District.

DOMICILIARY PHYSIOTHERAPY

Cost and Benefit

CHAPTER II

Measurements and Method

This chapter describes the measurements used with the initial sample of 200 patients during the period August 1977 to August 1978 inclusive.

GENERAL STRUCTURE

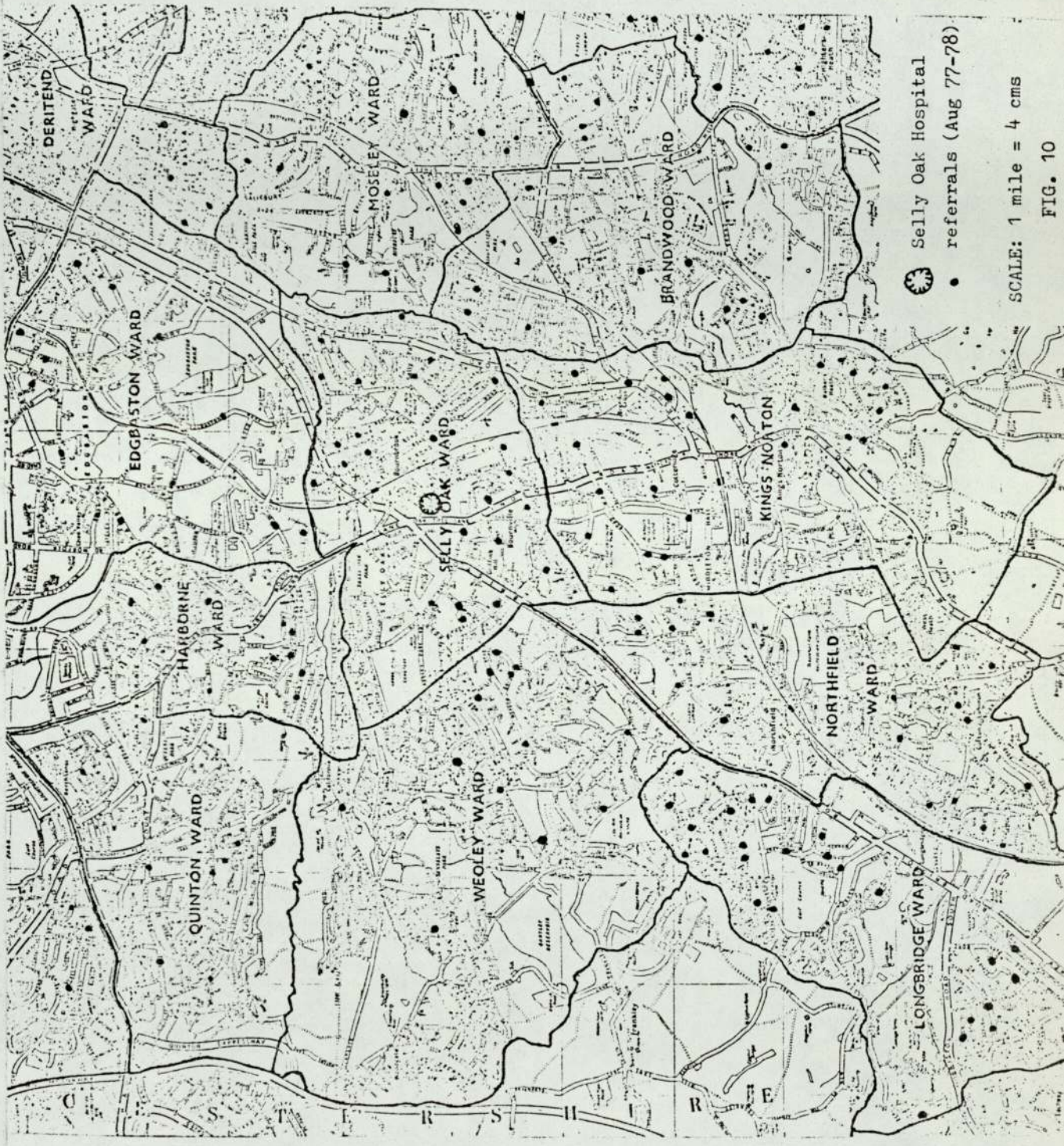
The study was based on the general practices situated in the South Birmingham Health District, involving a total of 109 GP's with a patient population of approximately 256,000, over 31,000 of these patients being aged sixty-five years or over.



As previously mentioned the South District provides the bulk of the service to the elderly patient in the Central Health District and the total patient population of both catchment areas is 457,893 with over 52,000 patients in the age range sixty-five and over, District Profile (1974). The potential workload for the domiciliary physiotherapy service could be estimated by comparing the primary and secondary service staff patient ratios. The ratio in the domiciliary service being 1:19,764 and that in the hospital based service being 1:6,105.

The clinical work during the period of the main study covered by this chapter was carried out by three senior physiotherapists, Mrs J Burrell, Mrs S Rollason and Mrs C Ankcorn. Holiday and sick-leave cover was provided by the author.

The Study Design

Patients were randomly referred to one of the three groups as shown in the diagram, page 52, using the same criteria as described for the pilot study, shown on page 34. The sample was potentially sub-divided into three separate groups, initially determined by the referrals made by the general practitioner.



 Selly Oak Hospital
 referrals (Aug 77-78)

SCALE: 1 mile = 4 cms

FIG. 10

Out of the 109 GP's nearly 70% made more than one referral.

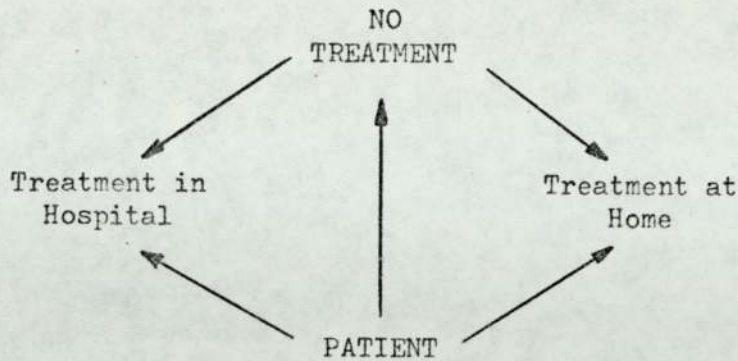


FIG. 11

During the course of the study, the consultant geriatricians made a total of 42 referrals, 21% of the sample. The geographical spread of referrals received during the course of the study is shown on the map on page 51.

As can be seen, there were a number of referrals which came from outside the district boundaries. Most of these came from geriatricians within the South District who offer a service to the patients from Central District. Some referrals were also received from the physiotherapy department at the General Hospital.

The initial sample selection was, therefore, outside the control of the physiotherapy staff and was entirely dependent upon the doctors in the district and upon their decisions as to which of their patients required physiotherapy treatment. As can be seen the referrals occupy a wide spread on the map and it could be argued that the sample obtained was a random sample.

During the course of the study there were many patients who, because of extreme frailty or a particular illness, were unable to have their physiotherapy treatment anywhere but in their own homes. There were also patients who required immediate treatment. One such

patient being a recently discharged hip replacement who required treatment on her discharge home, in order to live alone. These patients were assessed as described but, as they could not be randomly assigned to any group, could not be included in the study. During the early weeks of the study it rapidly became evident that the patients being referred fell mainly within this type, requiring immediate treatment and it would not, therefore, be possible to collect three equal sub-samples for comparison purposes.

The presence of these patients in the study sample and their reaction to treatment was recorded, as were the treatment costs involved, and this data was collected as it was considered that such information could be utilised. Because the study was carried out within an existing physiotherapy service the service element always had precedent over the data collection.

Measurements

One of the aims of the study was to determine the cost of providing a domiciliary physiotherapy treatment to the elderly patient and to compare this cost with the cost of a similar treatment given in the hospital physiotherapy department. It was also expected to be able to identify the benefits of such a service with a view to assigning a monetary value to them. The measurement of cost is relatively easy and does not involve the use of measuring devices. The method of recording costs is described at a later stage in this chapter.

In order to determine what benefit, if any, could be obtained by the provision of a domiciliary physiotherapy service to the elderly, necessitates the measurement of both hard and soft benefits.

To be able to identify such benefits requires the ability to accurately measure treatment outcome. It was considered that a measurement showing an improvement, which was common to a group of treated patients yet lacking in a control group, would suggest that physiotherapy treatment had been of benefit to the patient in the treated group.

To test the hypothesis described in Chapter 1 required a range of tests which were applied to the three groups of patients making up the total sample. The measurements used throughout were specifically designed for use in the study to take account of the special problems related to the elderly. Owing to the lack of available funds, these measurements represent a compromise between what was desirable and what was available. Due to this compromise there are weaknesses in the assessment procedures which are discussed in the final chapter.

What Is Being Measured?

1. Function
2. Pain
3. Patient satisfaction with treatment.

The above elements were selected for comparison as they are all common to most of the patients in the study and can all be influenced by treatment. They are also all measurable in a variety of ways, described below.

Function

This is measured in two ways:

1. Sections 2, 3 and 4 of the PHYSIO assessment card.
2. The assessment grid.

PHYSIO ASSESSMENT CARD

This card is designed to be used by both the general practitioner and by the physiotherapist, to assess the patient's condition before and following a course of treatment. In this study this was the only method of assessment which was used by both the doctor and the physiotherapist.

There were many comprehensive systems of assessment available which are bulky and which require considerable time to complete and it was decided not to use such systems on the grounds that neither the doctor nor the physiotherapist were likely to have the time to spare to complete lengthy assessment procedures for every patient in the study. Past experience gained with previous studies involving the District GP had confirmed that a considerable percentage of doctors were unlikely to complete even a simple questionnaire. It was, therefore, essential that the assessment used in the study should be as simple as possible. At the same time it had to provide a consistent and accurate record of the patient's condition.

It is self-evident that such an assessment on its own is inadequate to reflect fully all the changes in the patient's condition. Nevertheless, the card provides a guide to the patient's condition and results which it reflects are supported by alternative measurements; it has proved to be a reliable indicator. The PHYSIO assessment is loosely based on the PULHEEMS system used by the British Army and on the PULSE system used by the American Army. In both forces these systems are used to record details of the soldier's health. The simplicity and speed of completion, inherent in these systems, made their adaptation ideal for use in the study.

The form is divided into six sections, covering all areas of the body and includes the mental state. There are four degrees of

FIG. 12

SOUTH BIRMINGHAM HEALTH DISTRICT
 COMMUNITY PHYSIOTHERAPY
 PHYSIOTHERAPY ASSESSMENT FORM

P	<u>PAIN</u> 1. NO PAIN 2. SLIGHT PAIN 3. MODERATELY SEVERE PAIN 4. SEVERE PAIN
H	HEAD, SHOULDERS, UPPER LIMBS AND TRUNK. 1. NO ABNORMALITIES 2. MINOR ABNORMALITIES 3. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 4. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
Y	MOBILITY, INCLUDING PELVIS AND LOWER LIMBS 1. NO ABNORMALITIES 2. MINOR ABNORMALITIES 3. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 4. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
S	<u>STABILITY, BALANCE</u> 1. NO ABNORMALITIES 2. MINOR ABNORMALITIES 3. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 4. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
I	<u>INCONTINENCE AND EXCRETORY FUNCTION</u> 1. COMPLETE CONTROL 2. OCCASIONAL STRESS INCONTINENCE 3. PERIODIC BOWEL / BLADDER INCONTINENCE / RETENTION 4. TOTAL INCONTINENCE
O	<u>OTHER INCLUDING MEDICAL CONDITIONS</u> 1. NO ABNORMALITIES 2. MINOR ABNORMALITIES 3. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 4. SEVERE ABNORMALITIES REQUIRING COMPLETE SUPERVISION

COMMUNITY PHYSIOTHERAPY

PATIENTS NAME.....AGE:.....SEX:.....
 ADDRESS.....

P	H	Y	S	I	O	DATE
ASSESSMENT ON FIRST VISIT						
ASSESSMENT ON SECOND VISIT						

DOCTOR.....
 PHYSIOTHERAPIST.....

abnormality ranging from no abnormality to severe abnormality with minor abnormality and moderately severe abnormality as the intermediate measures. The qualifying distinction between the two intermediate grades of abnormality is that a minor abnormality is likely to be tolerable to the patient, while a moderately severe abnormality is likely to cause the patient to demand attention.

The card can be used to assess function by using the boxes labelled P, H, Y, I and O. Box P reflects the patient's overall condition; box H covers upper limb function; box Y includes lower limb function, including walking and balance, box I reflects bladder and bowel function, while box O is used to cover the mental state of the patient.

This last element is of particular significance in this study, as over 75% of the elderly patients treated have expressed some degree of 'depression'. In most cases boxes H, Y and I are used to assess function. The choice of the acronym PHYSIO was deliberate because of the need, in the early days of the study, to publicise the service. It is the familiar contraction of the word physiotherapist and readily lends itself as a basis for the various sections of the assessment.

P : Physical Condition

This is an overall assessment of the patient and the assessment in this section should reflect the scores of the other boxes.

H : Head, shoulders, upper limb and trunk

This section includes all of the areas mentioned.

Y : Mobility

Poetic licence has been invoked, as the last letter heading this section is also the last letter of the word mobility.

This section includes the pelvis and lower limbs.

S : Sensory

The main symptom assessed under this heading is pain.

I : Incontinence

This section includes bowel and bladder function.

O : Other

This section covers all other areas including mental state.

The method of scoring is straightforward, the two extremes: no abnormality and severe abnormality, rating a score of 1 and 4 respectively.

The two intermediate states of abnormality, minor and moderately severe abnormality, are scored 2 and 3 respectively. A score of 2 reflects a minor abnormality without any functional deficiency, whereas a score of 3 reflects a functional loss.

ASSESSMENT GRID

The assessment grid is an adaptation of a similar grid, described by Williams (1975) and, in this study, is used to make a functional assessment.

The grid embodies two measures, along the top is recorded the patient's state and is labelled distress, while along one side is listed the assessment of the patient's functional state in terms of activities of daily living. The classification used are simple and can be quickly applied.

Distress Classification

This aspect is sub-divided into three stages:

1. None
2. Moderate
3. Severe

**COMMUNITY PHYSIOTHERAPY
ASSESSMENT GRID**

NAME..... AGE.....
 ADDRESS.....

ASSESSMENT GRID

THE ASSESSMENT GRID PRESENTS A TWO DIMENSIONAL CHARACTERIZATION OF PATIENTS STATE, BASED ON:—
 (1) THE OBSERVABLE STATE OF THE PATIENTS DISABILITY.
 (2) PATIENTS SUBJECTIVE FEELINGS OF DISTRESS.

DISABILITY

- (1) NO DISABILITY
- (2) INDEPENDENTLY MOBILE, LIMITED TO LIGHT HOUSEWORK AND SHOPPING.
- (3) LIMITED MOBILITY: ABLE TO DO LIGHT HOUSEWORK,
- (4) HOUSEBOUND: ABLE TO DO LIGHT HOUSEWORK.
- (5) HOUSEBOUND: LIMITED TO SELF CARE ACTIVITIES.
- (6) HOUSEBOUND: REQUIRING HELP WITH SELF CARE.
- (7) CHAIRBOUND: REQUIRING HELP WITH SELF CARE.
- (8) TOTALLY DEPENDENT.

DISTRESS

- (1) NONE
- (2) MODERATE
- (3) SEVERE

THIS CLASSIFICATION ENTAILS A MATRIX OF 24 POSSIBILITIES WHICH CAN BE ASSESSED BEFORE AND AFTER TREATMENT PERIOD. A GENERAL MOVEMENT UPWARDS AND TO THE LEFT SHOULD BE OBSERVED IF TREATMENT IS HAVING POSITIVE EFFECT.

DISTRESS

	1	2	3
1			
2			
3			
4			
5			
6			
7			
8			

DISABILITY

DOCTORS SIG..... DATE.....

PHYSIOTHERAPISTS SIG..... DATE.....

FIG. 13

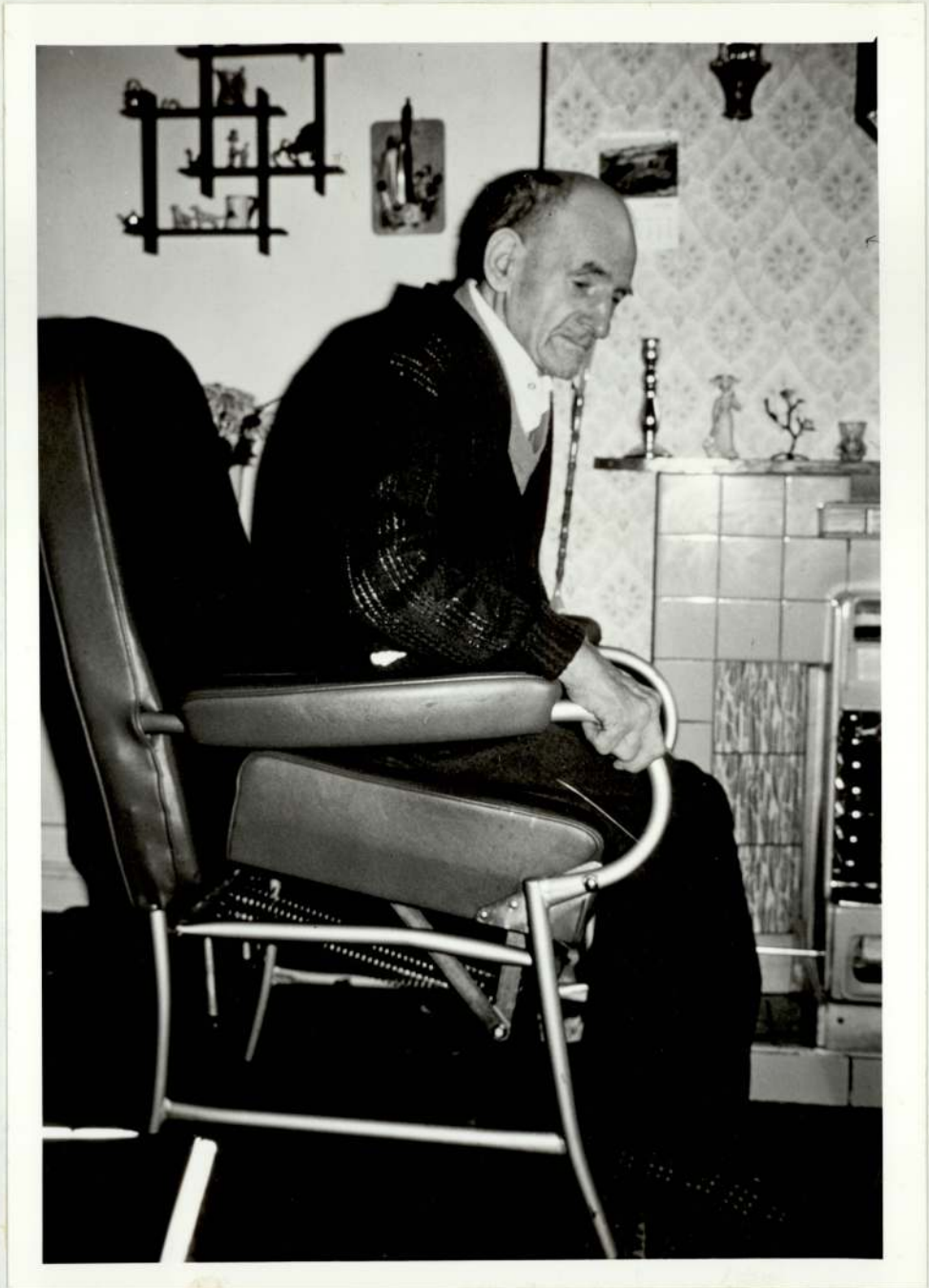


Plate 6

The domiciliary physiotherapist can arrange the provision of aids to mobility such as the spring assisted standing chair illustrated here. She will also instruct the patient in its use and how to adjust the springs to the correct tension for his weight.

This section of the grid reflects the distress felt by the patient with regard to his physical condition and, at the same time, provides some measure of his mental state.

Disability Classification

This side of the grid is divided into eight sections:

1. No disability.
2. Independently mobile, limited to light housework and shopping.
3. Limited mobility, able to do light housework.
4. Housebound, able to do light housework.
5. Housebound, limited to self-care activities.
6. Housebound, requiring help with self-care activities.
7. Chairbound, requiring help with self-care.
8. Totally dependent.

The scale used ranges from no disability to totally dependent, two extremes common to most methods of assessment of disability. The intervening parameters have been selected most accurately to reflect slight changes in functional capacity in patients of the age group in the study.

The intervals chosen are related to function and take no account of disability or pathological condition. Because of this the grid is useful as slight changes in functional ability can often be achieved which are unrelated to any change in the physical condition of the patient.

1. No disability.

This assessment is self explanatory.

2. Independently mobile.

This assessment is applied to a patient who is mobile outside

the home and who can do light shopping as well as household tasks.

3. Limited Mobility

This assessment is applied to a patient who can walk outside the home with the aid of a stick or waling aid, but who cannot carry shopping. Able also to perform light household tasks.

4. Housebound

This assessment is applied to a patient who cannot move around outside the home without help of some other person or use of a wheelchair. Is able to perform light housework, perhaps moving around the house with furniture providing the support. An example of such a patient is shown in Plate 6.

5. Housebound

This assessment is applied to a patient who is confined to the house but is unable to perform light housework. Can wash, dress and feed himself.

6. Housebound

This assessment is applied to a patient who is confined to the house and who requires help with all self-care activities.

7. Chairbound

This assessment is applied to a patient who is mainly confined to a chair, but may be able to independently transfer from bed to chair. Requires help with all self-care activities.

8. Totally Dependent

This assessment is applied to a patient who is confined to a chair or to bed and who cannot move from one to the other without help. Requires full-time help with all activities.

This system of assessment entails a matrix of twenty-four possible states. The patient is assessed by the physiotherapist before the treatment course begins and again upon completion. A general movement upwards and to the left should be observed if there is any improvement in the patient's state.

It is possible to assign monetary values to each of the states shown on the grid. Rosser and Watts (1973), suggests a valuation based on likely awards of compensation made by courts, to victims of injury or disease, as an example of how the grid could be costed. In this study it was thought unlikely that such a method of valuation could be applied because the patients have all retired.

Until a satisfactory method of costing changes in the functional condition of these patients can be worked out, this grid is used to reflect changes in the patients functional abilities following treatment and is also used as a back-up to the PHYSIO assessment.

THE MEASUREMENT OF PAIN

Psychophysics has been useful in laboratory investigations into the measurement of pain, but research has shown that no matter how sophisticated the equipment may be on the stimulus side subjective response is the vital measure. Melzack and Torgenson (1971) examined the pain literature and assembled lists of descriptive words of which 102 were included in their final list. They stated that many words are used to describe pain and there is a high level of agreement that the words fall into classes and sub-classes representing the dimensions of pain, and that substantial numbers of words have the same relative intensity scale for people of widely divergent backgrounds.

Pain is a label which represents many different experiences, for example, pain can be pinching, boring, cramping, burning, wrenching,

gripping and so on. Lasagna (1958), is of the viewpoint that, for reliability no other measure can approach verbal report.

Janis (1958), in a detailed study of pain via the medium of subjective report using a psycho-analytic framework for analysis. This method was described as consistently accurate, but difficult, as it requires considerable psychological knowledge of the patient, trained personnel and a great deal of time.

Argyle (1969)(a), added an extra dimension when he reported that patient/observer interaction is a complex process, in which the verbal component represents only a small proportion of the whole exchange and in which personality differences may occasion wide variations in response.

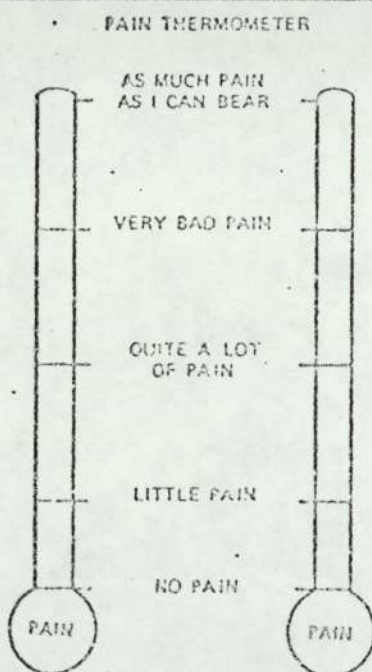
It is common experience that methods of pain measurement based on observation of physiological responses present difficulties of interpretation, as it can be uncertain whether a recorded response is due to pain alone, and most techniques require a subjective response as a dependent variable. Beecher (1959), was unable to find a method of determining pain threshold constancy in man, but stated that many factors influenced the pain threshold.

There is, as yet, no objective method of physiological measurement of pain, nor has it yet been demonstrated, that any other measure of pain can produce more consistently accurate results than verbal report.

THE PAIN THERMOMETER

With the above background knowledge in mind, the pain thermometer was designed by the author for use in the study of domiciliary physiotherapy in South Birmingham, Frazer (1978)(e).

SOUTH BIRMINGHAM HEALTH DISTRICT COMMUNITY PHYSIOTHERAPY	
M/F Surname	Forenames
Address	
National Health Service Number	Date of Birth



Signed _____

SELER

FIG. 14 : Pain Thermometer Used In The Study

As can be seen, this provides a visual analogue scale which is easy to read and which includes a condensation of the whole range of subjective expression of pain. The scale has five points and the basic idea was taken from Lasagna (1958) and Joyce (1968). Research has shown, Hardy et al (1947) that people can discriminate about twenty-two increments of intensity between threshold

pain and pain of maximum intensity. For the purpose of this study the five points chosen were considered adequate.

At either ends of the scale 'no pain' and 'as much pain as I can bear' are self explanatory. 'Little pain' is a pain which is tolerable. 'Quite a lot of pain' describes a level of pain which would require the use of analgesics, while 'very bad pain' is a level of pain which will seriously disrupt function and will require treatment.

Method of Use

The patient is presented with the pain thermometer before the treatment is begun and is asked to identify the point on the scale which he feels most accurately represents his pain. This point is marked with the date and the pain thermometer is filed with the patient's notes. This procedure is carried out before each subsequent treatment session.

When the course of treatment is completed, the pain thermometer readings are then transferred on to a graph. Out of the sample of patients treated, there has been only a few patients who have had difficulty in understanding the pain thermometer, and its use has been extended to other groups of patients in the physiotherapy department at Selly Oak Hospital.

PATIENTS' SATISFACTION WITH TREATMENT

The provision of physiotherapy is a service to the patient and it is likely that the patient has a view to express with regard to such a service.

In an effort to determine the attitude of the patient towards the domiciliary physiotherapy service, a questionnaire was devised for completion by the patient.

The patient is required to give an answer to each of the following questions, indicating their opinion along a five point scale, ranging from 'much worse' to 'much better' with the intermediate points 'slightly worse', 'no change' and 'slightly better' following the type of procedure devised by Likert (1932), for attitude measurement.

1. Do you feel better following physiotherapy at home?
2. Do you feel better following physiotherapy in hospital?
3. Are you walking better?
4. Has your pain eased?
5. Has your stiffness improved?
6. Has your strength increased?
7. Is your balance better?
8. Is climbing stairs easier?
9. Is dressing easier?
10. Any changes in general health?

In this study it was assumed that subjects would perceive 'much better' as being more favourable than 'no better' or 'much worse'.

The answer to the first two questions will depend upon whether the patient had been treated at home or in the physiotherapy department.

This questionnaire is of value as it provides some indication of the patient's attitude to treatment, is extremely easy to complete and is inexpensive. It is recognised that such a method can be



criticized on the grounds that a person, such as a patient, who has received a service, for example a treatment, is likely to view the provider with gratitude, even if the service provides no benefit. This type of bias which probably accompanies every clinical interaction can also be described as the placebo effect.

Owing to the possible existence of such biases, it could be argued that no patient will be disparaging of his treatment. Evidence obtained so far has indicated that this is not the case. Patients quite readily state that the treatment they have received has not improved their pain, stiffness, walking and so on. The evidence provided by the patient is used only to support the more objective measurements provided by the other assessment procedures.

Further Information about the Patient

Referral Card

Together with the measurements described above, a number of other tests have been used in the study. The referral card is used as a means of recording such details and acts in a similar fashion to a Patient Care Audit. The same card is also used as a Problem Oriented Medical System, in that the patient's problems are listed and progress is noted in such a way as to allow a retrospective assessment of the effects of treatment on the patient's presenting problems.

The card is used to record the results of various tests, such as FEV1, Strength Duration Curves, Goniometer readings, MRC grading and so on. Because of this use the referral card is included in the list of measurements used in this study.

Social History

The social history of each patient is recorded by the social history questionnaire. A copy of this is in Appendix 1 along with other measurements used in the study. This questionnaire records details of the patient's background, medical history, social details and interests as well as services they receive. It is expected to be able to use this data obtained in the matching of the sample groups and as a general background to the study.

All of the above measurement devices have been used in the study by either the general practitioners or the physiotherapists carrying out the treatments. At no time during the course of the study have any patient assessments been carried out by the author.

Method of Referral

Normally the referral is made by the general practitioner and the method adopted is based on the assumption that this was the case. There is a separate description of the referral procedure for referrals from other members of the community team.

General Practitioner Referral

A referral scheme was designed for this purpose by the author and printed on card. This card is the same size as other documentation used in the general practice and fits the patient's NHS envelope. The doctor records the patient's name, address, age, sex together with the diagnosis and details of the patient's medical history. If relevant, details of past medical history and details of drug therapy are included.

There is also a request for treatment, either specific or general. The referral card is signed by the doctor and posted to

the community physiotherapist at Selly Oak Hospital. On receipt, two copies are made, the original is filed, the first copy is kept in the patient's envelope which is used to hold all of the documents concerning his treatment, the second copy is left in a similar envelope in the patient's home.

On each occasion that the patient receives physiotherapy treatment, details are recorded on his referral card. These details are recorded on both copies of the card as this card is used as a means of communication with other professional staff calling on the patient. These staff can record their own comments or leave messages regarding the patient's treatment. The patient is, of course, free to read this card and to avoid possible bias, the therapists comments are restricted. Should there be a need to pass confidential information, a message would be left for the person involved to telephone the physiotherapist. The referral card thus acts as a link between the various staff calling on the patient, in a similar fashion to the Kardex system, used in hospital. It has proved to be a cheap and effective method of communication within the community. Each general practitioner in the District has had a supply of these cards delivered to him.

Referrals by Other Staff

The individuals making these referrals have been listed above and can involve relatives or even neighbours. Such referrals are usually made by telephone or by personal calls at the physiotherapy department at Selly Oak Hospital.

There is a slightly different method used for handling these referrals. On receipt of such a referral, a member of the community physiotherapy staff visits the patient, if necessary on the same day.

She makes her initial assessment of the patient, then contacts the patient's doctor and asks him to visit the patient and make his assessment. She posts a copy of her findings to the GP and may suggest possible treatments to the doctor.

When the doctor visits the patient to make his initial assessment he may forward a referral card to the physiotherapy department, or leave it for collection at the surgery. If no referral card is received from the doctor, the physiotherapist completes her own referral card, noting on it that the GP has been informed. This is essential as the GP acts as the medical supervisor during the course of physiotherapy treatment.

During the course of the study an increasing number of referrals were received from the consultant geriatricians. Some of these referrals requested the advice of the domiciliary physiotherapist regarding the suitability of the patient for domiciliary treatment as opposed to hospital admission. These referrals are dealt with in a similar way to those of the general practitioner, except that the consultant completes the assessment card and a report is sent to the patient's GP.

Documentation

Together with the referral card, described above, there are a number of forms which were designed for use in the study. These include the physiotherapy report card, the appointment card, the letter to GP's including a guide to completing the assessment, and a circular letter to remind the doctor that he should visit his patient to make his final assessment. There is also a letter describing the study.

Calling cards have been printed for each of the staff, as it is important, when calling on the elderly, to be able to provide some means of identification. Examples of these documents are contained in Appendix 1, page 260.

Data Collection

The collection of data is listed under two separate headings costs data and benefits data, with each heading sub-divided into three sections.

Costs and Benefits

Costs are listed under three headings, costs to the supplying authority, costs to the consumer and costs to the community. Benefits are listed as outcomes under similar headings. This information is presented in tabular form in the results section of this paper, on pages 125-126 and pages 162 - 165.

Methods of Recording Costs

Petrol costs are recorded daily by each physiotherapist who registers each journey in two ways. She carries a folder with a form for each of her calls on a particular day. This form was specially designed to enable the physiotherapist to log the date and time of each journey, the mileage involved along with the duration of travel and treatment time. At the end of each week, this data is transferred to an account book. The mileage allowance is claimed on the standard expenses claim form, which is forwarded to the finance office at the end of each month.

Treatment time costs are recorded in a similar fashion and a cumulative total is kept each day in the physiotherapists own diary. The totals for all of the community staff are transferred at the end of each week to a register, which is maintained at Selly Oak Hospital. These costs are based on the salary of the physiotherapists working in the community and include an element for superannuation and national insurance. A monthly print-out of salary costs is provided by the District Finance Office. Equipment and uniform costs are obtained annually and there is a separate computer coding for community physiotherapy. Stationery and printing costs are obtained directly from the District Supplies Office. Telephone and postage are listed on each occasion that they are made, a cumulative total being kept in a separate register.

As the majority of the clerical work for the community physiotherapy service was done by the physiotherapy staff, the cost of this work is not listed as a separate cost, but is included as an estimated figure. This figure was obtained by adding together the total treatment and travelling time during the period covered by this paper. The figure obtained was then subtracted from the total time available for working hours. The resulting amount is a combination of costs associated with the study which are difficult to separate, but which can be listed. From this amount an average cost can be determined and an amount assigned to each treatment given. Although this method is not strictly accurate in a micro-economic sense, it does enable a reasonably correct estimate to be made of such costs.

If more detailed information was required than that obtained, the cost involved would have been outside the resources of this study.

Costs included in this section are:

Clerical and administration.

Case conferences.

Meetings with doctors, district nurses and other staff.

Lectures to students on domiciliary work and preparation of these.

Study courses in connection with community work.

Equipment preparation, including purchase and maintenance.

Preparation of exercise sheets and completion of assessments.

Visitors to the project centre and teaching of students.

Coffee breaks, etc.

A DHSS circular describes an efficient physiotherapy department as one in which at least 70% of the physiotherapist's time is spent in treatment of the patient, including directly associated paper-work.

Such an estimation was taken into account when establishing the final figure for the costs listed above. Any excess costs, over and above those listed were assumed to be the costs of the research element in the study, as the research was superimposed upon the service being provided to the patient. The costs incurred by the patient because of the domiciliary treatment included time, inconvenience, use of soap, water and towels, electricity, refreshment and so on. These costs could only be based on estimates at this stage, but may be determined retrospectively.

A similar problem exists in identifying the exact cost to the community of providing such a service. Within the resources of this present study, it is only possible to make an estimate of these costs which include the cost of general practitioner involvement in making referrals, assessments and visits, together with similar costs incurred by other professional staff. These costs include

postage and telephone calls.

Benefits

This data is also listed under three headings which in the study described are termed 'outcome'. The three areas affected are the supplying authority, the consumer and the community

The outcome with regard to the supplying authority is obtained by estimates which were based on individual cases in the study. These included, savings on capital development, ambulance or hospital car costs, clerical and portering time, as well as fewer hospital admissions and possible earlier discharge from hospital.

Consumer outcomes included the elimination of journeys between home and hospital and the associated discomfort and inconvenience. The involvement of relatives more closely in the rehabilitation process, privacy and comfort of the treatment area, the maintenance of self-respect and motivation.

These outcomes were identified with the help of the various assessments used during the study. The assessments indicated where any changes occurred in the physical and psychological state of the patient and, although difficult to cost in this age group, they can be identified. It was possible, in certain cases, to show that domiciliary physiotherapy had reduced the cost of nursing the patient at home or had enabled a member of the family to return to work.

The outcomes from any service can be listed as benefits which can be described as either hard or soft this description is adopted in the results section of this paper.

Hard benefits can be measured in economic terms while soft benefits are more readily identified than costed. In this study

the hard benefits are costed but the soft benefits are merely listed. Each time a patient was transported by ambulance, the details of waiting and travelling times involved were entered on a form which was specially designed for this study.

The outcome with regard to the community in the way of benefit included saving on general practitioner time which could be identified in certain cases, possible saving on consultant time, district nurse and geriatric health visitor time may be identified at a later date.

An important benefit of the service is the prevention of hospital admissions together with the provision of a service to a previously deprived group of patients. In relation to the section on outcomes and benefits, it is proposed to extend this area of investigation in a subsequent study, in an effort to determine the financial benefit of a domiciliary physiotherapy service in the area indicated.

Additional Benefits

The Health District is providing the domiciliary physiotherapy service and there has already been a boost to the image of physiotherapy within the District. The articles mentioned on page 49, which have brought public attention to the study, as well as lectures to doctors, nurses and students from most health professions, have resulted in a number of visitors to the District. These visitors include doctors, nurses and physiotherapists from various countries including America, Canada, Israel, Australia, Argentina and Brazil, as well as many from Europe. Some of these individuals have come with requests for advice as they wish to set up similar services in their own countries or areas. The resultant publicity for the physiotherapy department at Selly Oak Hospital is a benefit with regard to recruitment. To date no recruitment advertising has been necessary for this hospital and there is always a

steady flow of applications for employment in the physiotherapy department.

The benefit of any such publicity might be balanced against the cost incurred dealing with enquiries, visitors and students. These costs are identified under the section listing research costs.

Final Discharge Procedure

When the patient has had a complete course of treatment, the GP is contacted and asked to make his final assessment. The physiotherapist will make her final assessment at the same time. When the assessment is received from the doctor, the two cards are filed along with the other case notes on the patient. The patient completes his subjective assessment and this is filed with his notes. A report is written by the physiotherapist and forwarded to the doctor with details of the treatment given and listing any changes in the patient's condition.

If the patient was thought to be 'at risk', his name was entered into a special register, which ensured that he received a regular visit each month to check his condition. The patient was also given a printed card with details of the physiotherapist's name, telephone number and instructions to contact her if there were any problems. This system helped to maintain contact with the patient and helped to prevent further problems with certain patients.

The procedure described above has been developed during the course of the study and is continually being modified in the light of experiences gained. It is probable that new methods will develop in the future and the study has proved to be a valuable source of ideas for the secondary physiotherapy service.

DOMICILIARY PHYSIOTHERAPY

Cost and Benefit

Chapter III

Sample Characteristics, Results & Costs

Introduction

This chapter presents the sample characteristic and the results obtained from the study of the 600 patients referred to the domiciliary physiotherapy service during the study period. The sample characteristics and the results are presented in three sections, the first section dealing with the first set of 200 patients, Section II dealing with the second 200 with the final 200 described in Section III.

This section presents the results obtained from the study of the first two hundred patients. The results and the accompanying commentary are presented in two parts; the first part dealing with the nature of the patients studied with details of age, sex, presenting medical condition, types of treatment given and the outcome of those treatments. Comparisons are given of the various groups of patients in the sample, ie the domiciliary group, the ambulance group and the 'no treatment' group. The source of referral is shown, together with details of the social characteristics of the sample. Details of ambulance journeys and waiting times involved are presented.

The second part concentrates on the costs and outcomes of physiotherapy treatment and includes a comparison of the costs involved in domiciliary and hospital physiotherapy treatment. The costs shown cover the initial setting up stage of the domiciliary physiotherapy service which includes equipment and research costs. The resulting average cost of a domiciliary physiotherapy treatment would be in the region of £7.00 which is matched by the cost of the hospital treatment when a similar discounting exercise is undertaken.

The Sample

The sample, discussed in this section of the report is formed by two hundred patients who completed their treatment during the period August 1977 to August 1978 inclusive.

The sample includes twenty-five ambulance patients, one hundred and seventy-five domiciliary patients and twenty 'no treatment' patients, the latter group including both ambulance and domiciliary patients. A much larger ambulance and 'no treatment' group of patients had been anticipated but because of various factors described below, the groups were disproportionate.

Factors Affecting Group Selection

1. When a patient was randomly assigned to one of the three possible groups using the method described earlier, he was visited and assessed. If the physiotherapist, as a result of her assessment, decided that the patient required immediate treatment, this began immediately at home.
2. Many referrals were described by the doctor as 'urgent' or as 'emergency' and could not therefore be randomised.
3. Many of the patients referred were either too ill or too frail to be able to endure an ambulance journey to hospital.
4. Many patients originally assigned to the ambulance group had to be transferred to the domiciliary group because of constant problems with the ambulance service, the most common problem being a failure to collect the patient.
5. In a number of cases the patient refused a second trip by ambulance because of his experience on the first. One example of this is provided by the case of a seventy-six year old man who had been recently discharged from hospital following a left femoral embelectomy. On his first visit to the hospital physiotherapy department for walking exercises he spent a total of six hours away from home including travelling,

treatment and waiting time. When he was finally taken home by hospital car at 5.10 pm, the car driver was unable to take the patient's wife who had been acting as an escort. She travelled home by bus and arrived to find her husband lying unconscious in the hall with cuts to his hand and leg. It transpired that the driver had left the patient at the front door of his home and, having been assured that he was alright, had driven off. On entering the house the patient had fainted, it is claimed, from fatigue and lack of food. The patient and his wife found this experience so unnerving that he would not come to hospital again by ambulance and was treated, subsequently, at home.

6. Arbitrary cancellation of the ambulance without any warning was a frequent feature of the ambulance group. During the course of the study a total of 18% of all ambulance journeys were cancelled in such a fashion. This proved extremely disruptive to the patient, his family and to the physiotherapy department.

No Treatment Group

The majority of the referrals received were of an acute nature and for this reason it was not always possible to delay the commencement of treatment for a three week period as planned.

Sample Characteristics

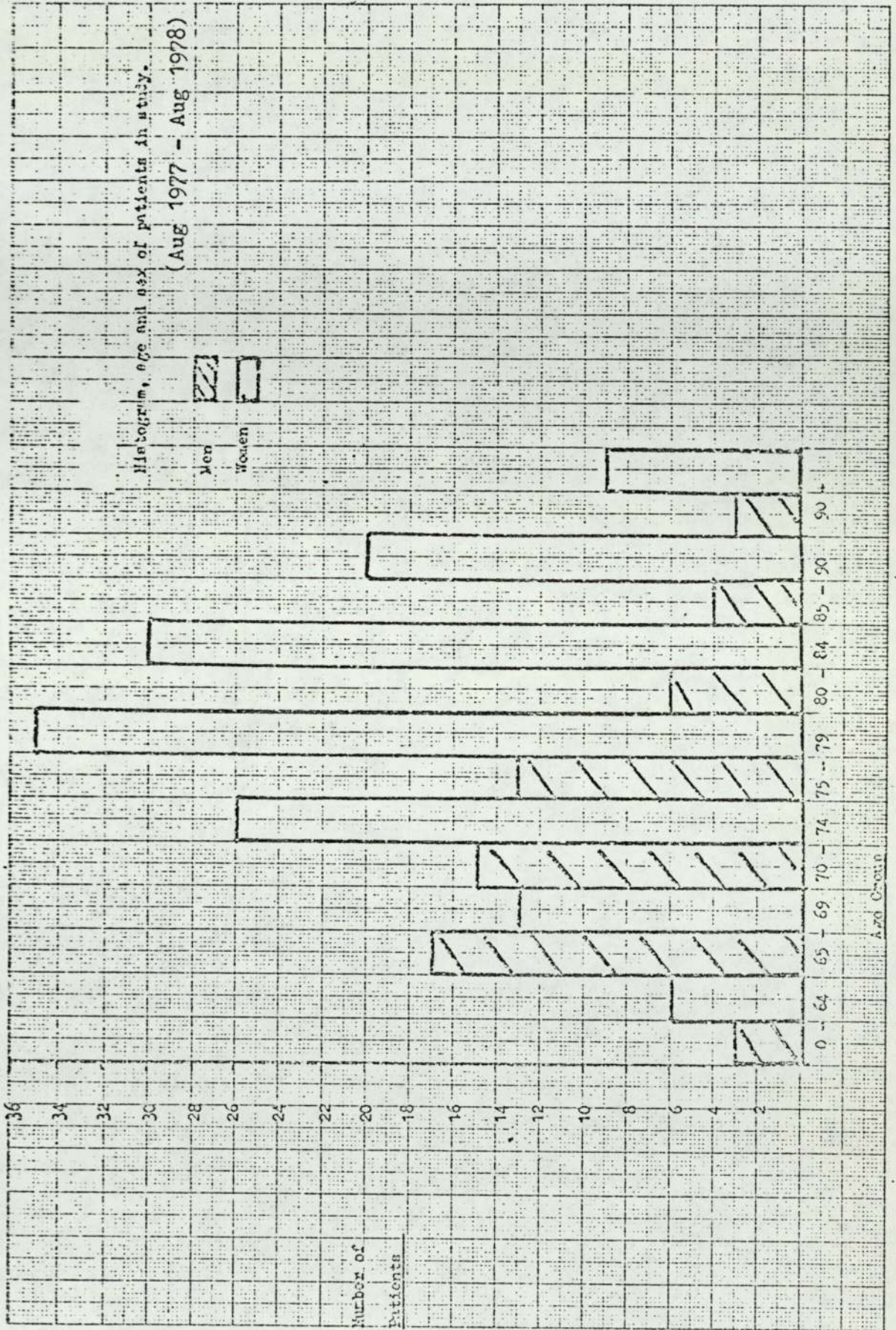
Age Range and Sex Distribution

The table overleaf shows the age and sex of the two hundred patients studied in the initial sample of 200 patients.

TABLE 3 : AGE AND SEX OF PATIENTS IN STUDY (August 1977 - August 1978)

	0 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89	90+	Total
MEN	3	17	15	13	6	4	3	61
WOMEN	6	13	26	35	30	20	9	139
TOTAL	9	30	41	48	36	24	12	200
%	4.5%	15%	20.5%	24%	18%	12%	6%	100%

FIG. 15



The age of the patients lay within the sixty-five to ninety plus with nine exceptions. These exceptional cases were all aged below sixty-five but, because of their special need, were included in the sample. The ages of the sample ranged between twenty-two and ninety-eight, with a mean age of seventy-three years for men and seventy-seven for women. The mean age of the patients in the ambulance group was seventy-three. The majority of the men were within the sixty-five to seventy-nine age group, while the majority of women were in an older group, seventy to eighty-four. About two thirds of the sample were female, roughly in line with demographic data for the elderly. Men predominated in the younger age group while there was a much higher proportion of women in the other age groups, with nearly five times as many in the eighty to ninety age group.

Social Characteristics of Sample

Table 4, overleaf provides information regarding the social characteristics of patients in the sample together with other factors which will be discussed under individual headings.

Thirty-two percent of the sample lived alone, forty-three percent lived with a spouse and twenty-five percent lived with a relative or, in a few cases, a friend. Seventy-one percent lived in a house, eighteen percent in a flat. Twenty-eight percent owned their home while forty-nine percent lived in council property, the remainder having private landlords. Forty-six percent were receiving rent rebate and sixty percent had a telephone. It was noted that homeowners had proportionately fewer telephones than council tenants. Ninety-four percent of the sample were old-age pensioners, forty-nine percent had an additional pension and six percent had relatives in

TABLE 4 : SOCIAL CHARACTERISTICS, WHOLE SAMPLE (August 1977 - August 1978)

Living Alone	Living with Spouse	Living with Relative	Living in a house	Living in a flat	Living in a bedsit	Other accommodation	Self Owned	Council Property	Other Landlord
32%	43%	25%	71%	18%	1%	10%	28%	49%	23%
Rent Rebate	Telephone	Geriatric Health Visitor	District Nurse	Home Help	Meals on Wheels	Social Worker	Old Peoples Club	Church Visitor	Bus Pass
46%	60%	6%	28%	31%	10%	2%	2%	2%	44%
Other Services	None	Requiring help	Fully Mobile	Mobile except for stairs	Walking with aides	Chair/bed fast	Help with Feeding	Help with Dressing	Help with Washing
16%	22%	73%	19%	20%	46%	15%	13%	45%	49%
Previous Hospital Admiss.	Never in Hospital	Discharged in the last 6 months	Discharged over 6 months	Fully Continent	Occasional Incontinence	Incontinent of urine	Regular holidays	Holiday last year	No Holidays
81%	19%	39%	42%	78%	16%	6%	12%	27%	61%
Old Age Pension	OAP plus other pension	Attendance Allowance	Regular Interests	No Interests					
94%	49%	6%	75%	25%					

receipt of an attendance allowance.

Level of Independence

Seventy-three percent of the sample required some form of help to maintain them at home, as shown in Plate 7. Only nineteen percent were fully mobile, forty-six percent required walking aids, while fifteen percent were chair or bed-fast. Forty-five percent required help with dressing and forty-nine percent needed assistance with washing.

The level of dependency, coupled with the age of the patients in the sample was fairly typical of the picture presented by the elderly patient in Britain. A similar picture was obtained by the Continuing Care Project, carried out in Liverpool in 1975 by Age Concern, Amos (1975), which found a wide range of problems in the elderly. These findings support the belief that the sample described in this report was representative of the elderly in a large city. The same findings also underlined the needs of the elderly in the community, many of which could be met by the domiciliary physiotherapy service.

Incontinence

Only sixteen percent of the patients suffered occasional incontinence, while six percent were incontinent of urine. In some instances patients were using cups and plastic buckets instead of the lavatory, in one case a tin mug was used. The reason for this was thought to be practical expedience as it was often difficult for the patient to get to the lavatory. The domiciliary physiotherapy staff became quite used to emptying the various receptacles and usually were able to persuade the patient to accept a urinal or a



Plate 7

Other aids to mobility available within the community are illustrated here, the Zimmer walking frame, the high chair and the Selly Oak Rehabilitation Boots, developed by the author for patients with footwear problems.

commode provided by the community stores.

There were, however, a small proportion of the patients who preferred their bucket to the standard NHS issue commode. It is believed that the reason for this is that the patients in question have refused to accept that they are not capable of functioning normally and regard the presence of a commode as an insult and refuse to accept its existence. In some cases the commode was found hidden under the stairs, beside the walking aid.

Services received by the patient

The majority of the sample received no services, thirty-one percent had a home help, twenty-eight percent were visited by a district nurse and ten percent had meals on wheels.

A surprisingly low forty-four percent had a pensioners bus-pass, twelve percent had visits from a geriatric health visitor, social worker or various other agencies. Sixteen percent received other services, most of them being paid for by the patient including hair-dressers, chiropodists, private physiotherapy, cleaners and church visitors.

Only twelve percent had regular holidays while sixty-one percent had no holidays. One patient claimed that he had never had a holiday in his life. Seventy-five percent had regular interests, mainly reading, gardening, watching television and sewing or knitting. Twenty-five percent claimed to have no interests whatsoever.

Main Presenting Diagnosis

Table 5, overleaf, shows the main presenting diagnosis by age group. Together with the main diagnosis, twelve percent of the patients had a second, third and sometimes fourth disability.

TABLE 5 : MAIN DIAGNOSIS BY AGE GROUP (Total Sample) Aug. 1977 - Aug. 1978.

	0-64	65-69	70-74	75-79	80-84	85-90	90+	Total	%
Rheum. arthritis		4	2	3	1	1		11	5.5%
Osteo-arthritis	1		11	13	13	3	2	43	21.5%
Cervical spond.				1				1	0.5%
Frozen shoulder			1		2	1	1	5	2.5%
Low back pain			1			1		2	1%
Other pain			3	1	3	2	3	12	6%
Hemiplegia	4	11	16	18	8	4	1	62	31%
Parkinsons		2		3				5	2.5%
Multiple Sclerosis	2							2	1%
Other C.N.S.	2	3		1		1	1	8	4%
Circulatory		1		2	1	1	1	6	3%
Bronchitis		2			1			3	1.5%
Respiratory		1	1					2	1%
Fractured femur		1	2	2	3	3	1	12	6%
Other fractures			2	1	3	1	1	8	4%
Hip operations		1	1	1				3	1.5%
Orthopaedic					1		1	2	1%
Other Conditions		4	1	2		6		13	6.5%
TOTAL	9	30	41	48	36	24	12	200	100%

FIG. 16

Histogram: Main Presenting Diagnosis (Men)
(Aug 77 - Aug 78)

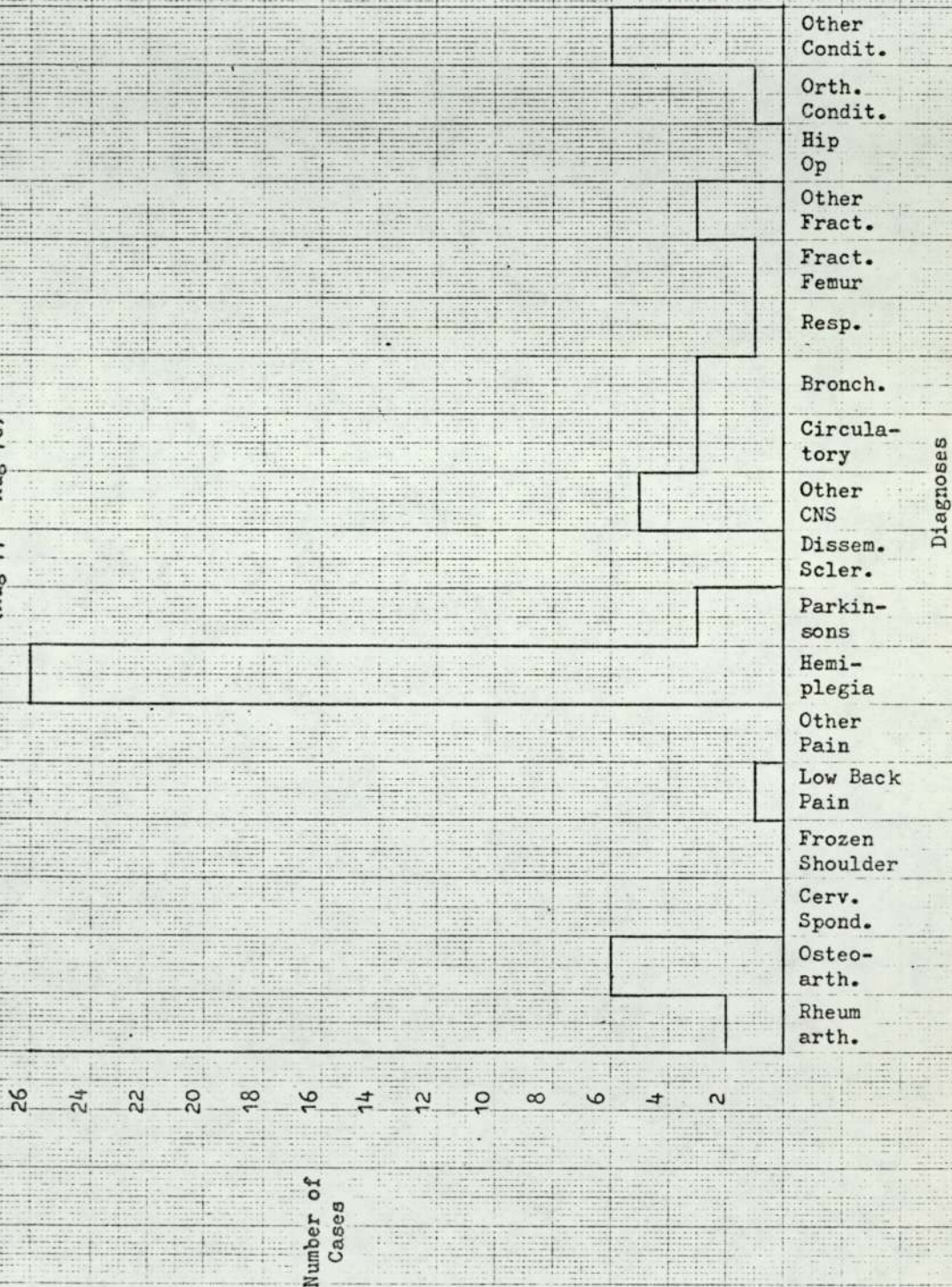
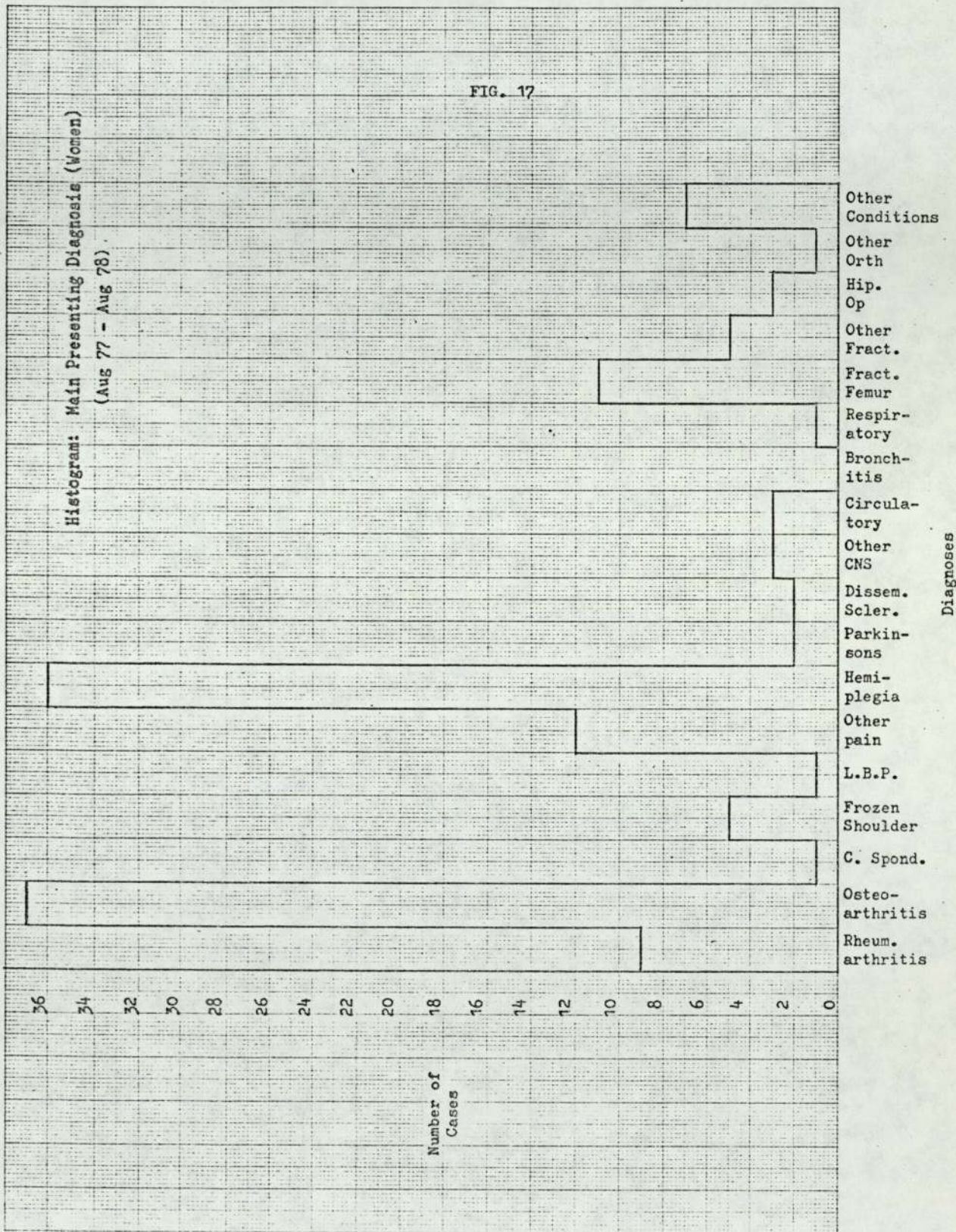


FIG. 17



The main presenting condition in men was a cerebral vascular accident, forty-two percent suffering from this condition, followed by ten percent with osteo-arthritis and ten percent with other conditions including muscle injuries, falls, immobility and the 'gone off legs' syndrome. In the case of women the main diagnosis was osteo-arthritis, twenty-seven percent, closely followed by cerebral vascular accident with twenty-six percent.

The majority of the male 'stroke' patients were within the sixty-five to seventy-four age group, while the female sufferers were mainly within the seventy to seventy-nine age group. In the case of osteo arthritis the men fell within the seventy to seventy-nine age group and the women with this condition were mainly within the seventy-five to eighty-four age group.

The only disease not common to both sexes was disseminated sclerosis which was confined to the female sample and bronchitis which was confined to the male. Hip replacements were found only among the female sample while fractured femur, other fractures and other orthopaedic conditions such as back pain and cervical spondylosis formed nine percent of the male group and fifteen percent of the female group.

For the sample as a whole cerebral vascular accidents were the predominant cause of referral, followed by osteo-arthritis. Twenty-two percent of the sample were suffering from some form of orthopaedic condition, including fractures, pain, frozen shoulder and so on. With three quarters of the sample suffering from conditions which affect their functional activities, it is apparent that there was a need for physiotherapy treatment. When this information is linked to that provided in Table 4, on page 84, which shows that seventy-three percent of the sample required help with some activities of daily living, the case for a physiotherapy service is underlined.

Source of Referral

The general practitioner was selected as the main source of referral and as the main medical supervisor for the study. During the collection of the sample described, it was found that just over 50% of the referrals had been made by the general practitioner. Twenty-one percent had come from the hospital consultant, twelve percent from the district nurse and the remainder from the health visitor, social worker and physiotherapists in other hospitals. Only one referral was received from the community occupational therapist. Table 6 on the following page shows the source of referral for the whole sample. Irrespective of the source of referral, the general practitioner is kept informed of his patient's condition and he is sent a report upon completion of the course of treatment. The hospital consultant referrals include those from geriatricians, neuro-surgeons and orthopaedic surgeons. The increase in these referrals to over twenty percent of the total is seen as the first significant link to be established between the hospital service and the community, as far as the rehabilitation service is concerned.

The significance of such a link and its previous absence is stressed in the report by Age Concern, Amos (1975) which states: "despite the great variety and high quality of the services available, the elderly on discharge from hospital often found themselves in limbo, in which their needs were poorly catered for".

The domiciliary physiotherapist could provide a link between the hospital and the community or in the reverse direction. She attends the weekly meeting of the geriatric division along with social workers, health visitors and occupational therapists. At this meeting, problem patients can be effectively dealt with and the physiotherapist can often provide relevant information which helps the consultant medical staff to co-ordinate services to the patient.

TABLE 6 : SOURCE OF REFERRAL, TOTAL SAMPLE (Aug 77 - Aug 78.)

General Practitioner	Hospital Consultant	District Nurse	Social Worker	Geriatric Health Visitor	Other Hospital	Physiotherapy Department	Community O.F.
101	43	24	4	12	2	13	1
50.5%	21.5%	12%	2%	6%	1%	6.5%	0.5%

The consultant geriatrician can also discharge a patient, confident in the knowledge that he can rely upon the services of the domiciliary physiotherapy staff.

One type of referral which is increasing in number is the consultant request for an assessment visit. The practice within the South Birmingham Health District Division of geriatric medicine involves a multi-disciplinary assessment of the patient. This activity can be extended into the patient's home with the help of the domiciliary physiotherapist. She can visit the patient and carry out an assessment which is more relevant than a similar assessment carried out in the physiotherapy department. The presence of the domiciliary physiotherapy service also allows the orthopaedic surgeon to discharge his patient earlier than was previously possible. The current waiting list for orthopaedic surgery in the Birmingham Area suggests that this could prove a valuable use of the domiciliary physiotherapy service.

Table 7, overleaf shows that, out of a total of one hundred and seventy-five domiciliary patients, 12 $\frac{1}{2}$ % were orthopaedic cases. Twelve of these patients improved, one showed no improvement, one was worse and four were admitted to hospital. As over half of this group of patients were aged eighty or more, this result is regarded as a considerable achievement on the part of the domiciliary physiotherapist.

The consultant geriatrician can also utilise the services of the domiciliary physiotherapist to maintain the old person at home, rather than admitting him to hospital. The importance of this facility was emphasised during the work to rule by the hospital engineers. During this period patients who would normally have been admitted to hospital had to be maintained at home with the assistance

TABLE 7 : OUTCOME OF TREATMENT BY MAIN DIAGNOSIS (Domiciliary Patients) Aug. 1977 - Aug. 1978.

	Much Better	Slightly Better	No Change	Worse	Hospital Admission	Transfer G.D.H.	Transfer O.P.D.	Died	Other
Rheum. arthritis		6			3				1
Osteo arthritis	5	14	5		8	2			2
Cervical spond.		1							
Frozen shoulder	2	2							
Low Back Pain		1							
Other pain	1	7	1						2
Hemiplegia	12	10	4	1	8	9	2	3	5
Parkinsons	1	2				1			1
Multiple Sclerosis		2							
Other C.N.S.	1	1	1		1	1			2
Circulatory	2		1						2
Bronchitis	1	1							
Other Respiratory		1			1				
Fractured Femur	2	4		1	3				1
Other Fractures	2	2	1				1		1
Hip Operations	1				1				
Other Orthopaedic		1							1
Other Conditions	1	2	3		4				3
TOTAL	31	57	16	2	29	13	3	3	21

of the domiciliary physiotherapist and her community colleagues.

The procedure with consultant referrals is similar to that for the GP referral except that the assessment is made by the consultant and the GP is informed.

Communication

An effective system of communication exists within the geriatric division of the South Birmingham Health District. This system provided a dynamic model for the domiciliary physiotherapy service and contributed to an awareness of the importance of effective communication when dealing with the elderly patient.

Experience has confirmed the value to be gained by meeting with colleagues at the weekly case conference of the geriatric division. The three domiciliary physiotherapists have had referrals from over 60% of the District's G.P.'s, from other paramedical staff in the District, as well as a number of G.P.'s and consultants from other Districts. With such a range of referring agencies the need for good communication is self evident.

Some of the methods by which this was achieved were described in the first chapter of this report and the communication network which has developed is a testimony to the effective groundwork by Mrs J Burrell during the early stages of the study. All of the medical staff involved in the study have been helpful and have been willing to provide advice when asked.

Types of Treatment Given

The treatment procedures which were used during the course of the study are shown in Table 8, on the following page.

TABLE 8 : TREATMENT PROCEDURES, WHOLE SAMPLE (men and women)

	MEN	WOMEN	TOTAL	%
Assessment and Advice	61	139	200	100%
Exercise	43	102	145	72.5%
Massage		7	7	3.5%
Heat	2	21	23	11.5%
Ultrasonics	4	24	28	14%
Interferential	2	9	11	5.5%
Low-frequency Currents		2	2	1%

(August 1977 - August 1978.)

Patients may have been given more than one treatment procedure during a visit and the actual number of measures used on a patient during the course of a call could have included up to four separate types of treatment. All of the patients received an assessment and advice, 72.5% were given some form of exercise and a sample exercise sheet is shown in Appendix 1. Ultrasound was given to a total of 14% of the sample and heat treatment to another 12%, while 6.5% were given interferential therapy. Only 3.5% of the sample were given some form of massage treatment and this figure was extremely interesting when considered alongside the brief background history of the profession contained in Appendix 6. It will be seen that massage was the main basis of the profession in the 1880's with examinations in the theory and practice of this skill. The fact that massage is now no longer a subject in the examinations of the Chartered Society of Physiotherapy is indicative of the complete change in the philosophy of rehabilitation, made clear by these figures.

This change has been in favour of more active work on the part of the patient and this is shown up by the fact that 82.5% of the patients in the study had exercise as some part of their treatment.

It is quite evident that old people like massage but, as it is an entirely passive treatment on the part of the patient, its value is limited. The patients who did have massage during the study had connective tissue massage, a specialised form, described in detail in Appendix 7, page 301.

When exercise is given as a treatment the work is performed by the patient which contributes both physical and psychological benefits to the patient. Exercises can also involve the relatives of the patient who were often asked to supervise a programme and

ensure that it was carried out regularly, Plates 8 & 9. As 68% of the sample had one or more relatives of the patient who were often asked to supervise a programme and ensure that it was carried out regularly. As 68% of the sample had one or more relatives living with them, the domiciliary physiotherapist was able to enlist their aid in the patient's rehabilitation. An exercise sheet was prepared for each patient with a suitable exercise routine. A copy was given to the relative and his role was that of a taskmaster and motivator, a role which was usually enthusiastically accepted.

The domiciliary physiotherapist may have been able to call no more than once a week and the importance of the relatives participation in this way is evident, particularly in the case of a patient with hemiplegia. These patients benefit from frequent reminders to do their exercises and this intensity of involvement of the relative is difficult to achieve in hospital but is natural in the home.

The benefit from this is threefold. The patient will benefit by the virtually unlimited attention of the relative which is guided by the domiciliary physiotherapist, who will adapt the exercise according to the progress of the patient. The relative will benefit from the opportunity to help with the treatment rather than by sitting helplessly by on the sidelines and the National Health Service will benefit from the work of these unpaid helpers in the community.

During the course of the study no problems have arisen from this involvement of the relatives as they were guided and advised by the domiciliary physiotherapist. Relatively small numbers of patients, 30% of the sample, received forms of treatment other than exercise. This demonstrates that the majority of patients referred during the study did not require any treatment other than exercise



Plate 8

The voluntary help of the relatives makes a significant contribution to the treatment of a patient within the community. Here a patient with a hemiplegia is being given passive movements to his arm by his wife. This simple procedure is taught by the physiotherapist and ensures that the arm does not become stiff while the patient is recovering. The involvement of the relative usually means that the patient will receive constant and frequent attention.



Plate 9

This shows the inflatable splint being applied to a paralysed arm by the husband of a stroke patient and is another example of a simple procedure which can be taught to a relative to help the patient.

and advice. This was found to be particularly the case with the hemiplegic patient as the majority of these patients were found to benefit from exercise. The advice given was usually for the benefit of the relatives and it is in this type of condition that the presence of the domiciliary physiotherapist would appear to be of the greatest value.

The sources of heat treatment available within the community include wax, infra-red, hot packs and ice. Although the latter is not a heat treatment, the effects produced are physiologically comparable. Short-wave diathermy was available but was not used with this particular group of patients. Table 9, overleaf, illustrates the point that certain groups of patients were less suitable for domiciliary physiotherapy treatment.

The nineteen patients, diagnosed as osteo-arthritis sufferers received between one and eleven treatments, whereas twenty-four patients, similarly diagnosed, required between twelve and twenty-six treatments before discharge. Similarly, patients diagnosed as rheumatoid arthritis included five who received between one and eleven treatments and sixteen who received between twelve and twenty-five treatments before discharge.

In the case of the stroke patients, forty-six received between one and eleven treatments, sixteen received between twelve and twenty-five treatments before discharge. It can also be seen that thirty-three or nearly half of this group of patients only required between one and four treatments before discharge. These results would seem to indicate that hemiplegia is more suited to domiciliary treatment than either of the arthritic conditions. There are a number of reasons why this may be so, Frazer (1980)(f). Provided the relative or family is keen to keep the patient at home and if there is good

TABLE 9 : NUMBER OF TREATMENTS, BY CONDITION (Total sample)

CONDITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	22	25	26	27	29	34	38
Rheum. arthritis	4										1	2			1	1	1	1								
Osteo arthritis	7	2	1		3	1		1	2		2	5	7	2	1	1	2	2	1	1	1	1				
Cervical spond.													1													
Frozen Shoulder									1		1							1	1							1
Low Back Pain							1																1			
C.V.A.	20	4	4	5	4	2	1		3	1	2	4	3	2	4						2	1				
Parkinsons	1	1						1			1	1														
Multiple Sclerosis						2																				
Other C.N.S.	2	2		1		1		1						1												
Circulatory	2			1	1		1											1								
Bronchitis		1						2																		
Other Respiratory				1									1													
Fractured Femur	4				1		1			1	2	1											1	1		
Other Fractures	1		2	1	1		1	1					1													
Hip Operation	1		1									1														
Orthopaedic	1									1																
Other Pain	2	1			1	1	1	1				3	1													
Other conditions	6	1	1	1	1	2																				1
TOTAL	51	12	9	10	12	9	6	7	5	4	9	17	14	5	6	2	4	5	2	4	2	1	1	1	1	1

family support, the patient has a strong psychological advantage.

This is a factor which is often missing in the hospital stroke patient who, on admission, simply becomes part of the process which submerges his individuality and independence. For example, he loses the ability to make minor decisions of daily living with regard to his meals, who he sits beside, which paper he reads, whether he wears trousers that fit and other apparently trivial decisions which form part of everyday existence. Once the power to make these decisions is lost the patient suffers a diminution of motivation. When this is coupled with the unfamiliar environment and the often confusing procedures it is unsurprising that the elderly stroke patient prefers to return home as soon as possible. In the home the physiotherapist can involve the relative in the treatment programme and, more important, can provide sound practical advice and support for the family, Plates 10 and 11.

In many instances during the study the main problem with the stroke patient treated at home was found to be his relatives, Isaacs (1971)(b). The treatment of the stroke patient heavily involves the relatives and they require training in handling the patient, both in bed and from bed to chair. This type of relative involvement is not usually possible in the hospital and it is ironic that many relatives would prefer to leave a stroke patient in hospital as they are afraid to have him at home. With the presence of the domiciliary physiotherapist this problem is less apparent.

Experience gained during the course of the study suggests that in terms of cost, efficiency and humanitarianism, there is little to be gained by admitting the stroke patient to hospital, provided there is adequate family support. It has been argued by Opit (1977),



Plate 10

This slide demonstrates the attempts by a relative to stand a patient with a stroke before they have been instructed in the correct method. Note the unstable posture of the patient and helper as well as the physical strain exerted by the helper.



Plate 11

This photograph shows the same patient standing with minimal help from the physiotherapist. Note the balance of the patient and the absence of strain on the physiotherapist. This method is taught to all relatives of stroke patients.

that such support is expensive, but the findings from this study would suggest the reverse is the case.

Assessment and Advice

Table 9, page 103, shows that 25.5% of the total sample had only one visit from the physiotherapist. Most of these patients were among those who did not complete a full course of physiotherapy treatment for various reasons. One patient was discharged as 'no change', seventeen were admitted to hospital, nine were referred to the day hospital, two were referred to the out-patient physiotherapy department, three died and nineteen were included in the 'other' category which was comprised of the following. One patient was admitted to a private nursing home, one patient was considered unsuitable for physiotherapy treatment and six patients had been referred for assessment only. Six patients were considered not to require any treatment, one patient had gone away, one patient refused to answer the door on three consecutive calls and was given up, one patient stated that she preferred to have private treatment and two patients refused to have anything to do with the physiotherapist. The fact that only nine patients, 4.5% of the total sample were considered as unsuitable for physiotherapy treatment suggests that the majority of referrals received were appropriate.

Range of Advice Given

The advice given ranged from suggestions for improving the activities of daily living and included the arrangement for visits by other agencies. Various aids could be ordered and delivered together with instructions in the use given to the patient and relatives.

Some of the advice was reinforced by printed instruction sheets which could be produced for individual patients. In this respect the domiciliary physiotherapist performed a teaching function and acted in a prophylactic role for the patient and his family. Many of the old people in the study were found to be very demanding, with no friends to help them, possibly as a result of their behaviour. Often the physiotherapists could provide help for such a patient although such help was expensive both in terms of time spent and in terms of the psychological strain on the physiotherapist.

The physiotherapy staff working in the community were selected using a number of criteria including general experience, initiative, reliability, conscientiousness and so on. Their most important attribute was the ability to communicate with the elderly patient. Physiotherapists are not trained in the relevant aspects of psychology and psychiatry and in consequence the staff were open to considerable stress when faced with the multiple problems existing within the community. In a period of nine months at the beginning of the study, three of the five staff involved experienced feelings of acute anxiety and depression which, in several instances, led to time off work.

It was apparent that working single-handed in the community could be a source of strain for the staff but they all enjoy the work and derive considerable satisfaction from it, Frazer (1979)(g). They have all stated that they have found many of their patients to be depressed and that such patients tend to become very dependent upon the physiotherapist. Appendix 1 contains a scale which was used during the study to measure depression.

Physiotherapists are not trained to handle problems of this nature on their own and this was thought to be an area where future research could be of value. The experience of the domiciliary

physiotherapy staff has led to a marked increase in respect for the general practitioner who spends a considerable amount of his time dealing with this particular problem. When the problem had been identified a social worker with psychiatric experience was approached and she agreed to conduct a series of training sessions and discussion groups with a view to helping the physiotherapy staff to deal with the problems that they were encountering. This could be regarded as 'shutting the stable door after the horse has bolted' approach. The problem, however, had not been envisaged before the study had begun.

In spite of the stress encountered all of the physiotherapy staff have expressed considerable job-satisfaction and wish to continue in this specialty. A number of doctors have observed that with the advent of the domiciliary physiotherapist they have been able to transfer some patients to the physiotherapist and have ceased to be troubled by the patients!

Treatment Outcome

Table 10, overleaf, shows the outcome of treatment by main diagnosis for the sample as a whole. This outcome is listed under a number of headings which can be separated into groups:

Group 1 : Much better, slightly better, no change, worse.

Group 2 : Hospital admission, transfer to day-hospital, transfer to out-patient physiotherapy, died, other.

Group 1

The assignment to one of the four outcomes within this group is based on a number of assessments, described earlier, with the patient's subjective assessment used as the main indicator of

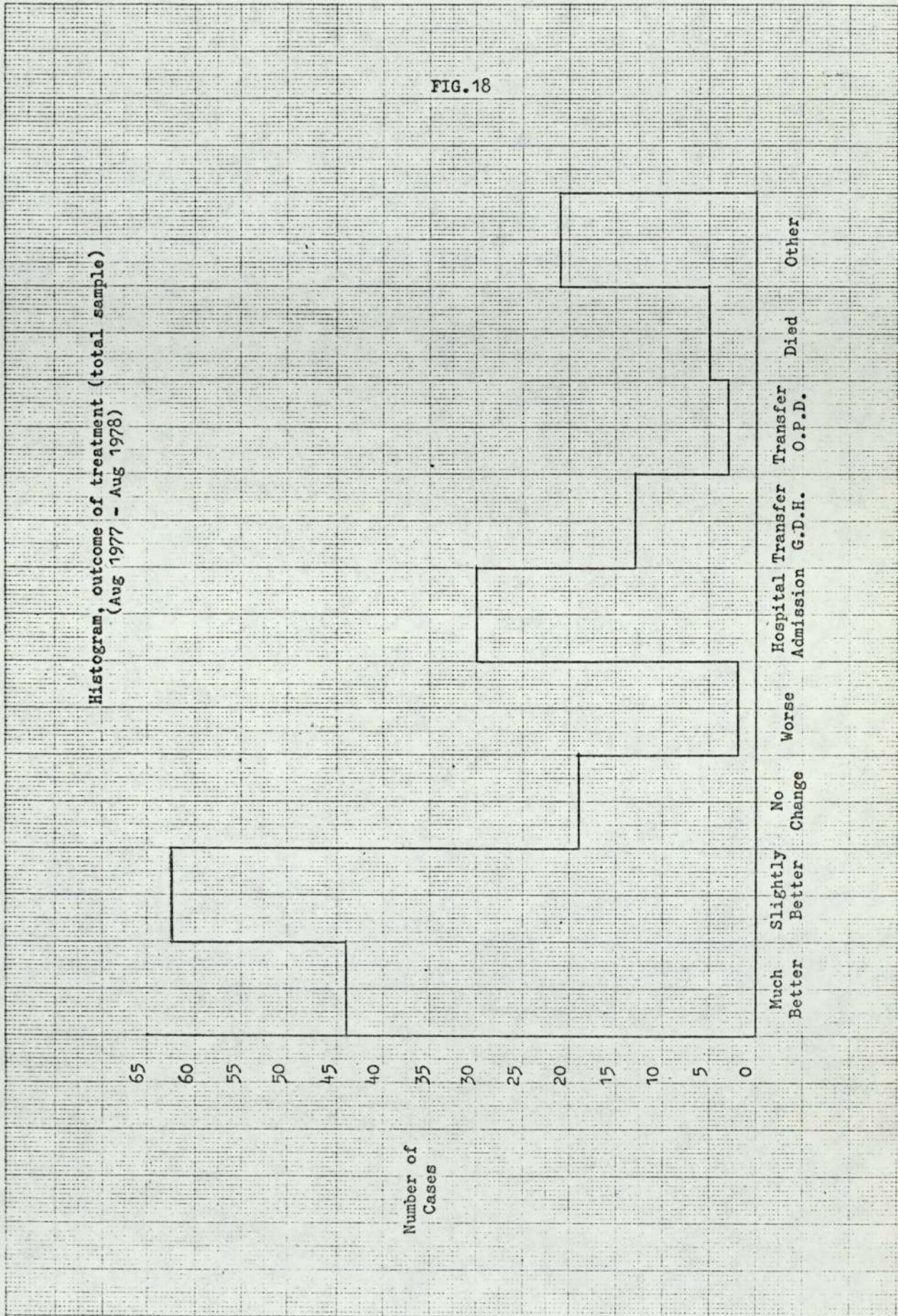
TABLE 10 : OUTCOME OF TREATMENT BY MAIN DIAGNOSIS (Total Sample).

(Aug 1977 - Aug 1978)

	Much Better	Slightly Better	No Change	Worse	Hospital Admiss.	Trans GDH	Trans OPD	Died	Other
Rheum. arthritis	1	6			3				1
Osteo arthritis	9	16	6		8	2			2
Cervical spond.		1							
Frozen shoulder	3	2							
Low back pain		2							
Other pain	2	7	1						2
Hemiplegia	15	11	5	1	9	9	2	5	5
Parkinsons	1	2				1			1
Multiple Sclerosis		2							
Other CNS	1	1	2		1	1			2
Circulatory	3		1						2
Bronchitis	1	2							
Respiratory		1			1				
Fractured femur	2	5		1	3				1
Other fractures	3	2	1				1		1
Hip operations	2				1				
Orthopaedic		1							1
Other conditions	1	2	3		4				3
TOTAL	44	63	19	2	30	13	3	5	21

FIG. 18

Histogram, outcome of treatment (total sample)
(Aug 1977 - Aug 1978)



achievement which, if supported by at least one other assessment such as the PHYSIO assessment, directs the patient to one of the four sections within the group. Using this method 22% of the patients were in the 'much better' category, 31.5% were placed in the 'slightly better' category, 9.5% were in the 'no change' category and 1% were in the 'worse' category.'

Of the 128 patients who completed a course of physiotherapy treatment, 34% were placed in the 'much better' category, 49% were in the 'slightly better' category, 15% showed 'no change' and 2% were placed in the 'worse' category. Thus 83% of the patients who completed a course of physiotherapy treatment showed measurable improvement on completion.

Group 2

Patients placed in this group are those who failed to complete a full course of physiotherapy treatment. 15% were admitted to hospital, 6.5% were transferred to the day-hospital, 1.5% were transferred to the physiotherapy out-patient department, 2.5% died during the course of the study and 10.5% were placed in the 'other' category.

Outcome of Treatment by Main Diagnosis

Table 10 illustrates that for patients who completed a course of treatment, the most encouraging outcome was with the hemiplegic patient. Patients with orthopaedic conditions also showed a good success rate. Those patients diagnosed as cervical spondylosis, low back pain, frozen shoulder and fractures, all showed marked improvement.

A satisfactory response to treatment was shown for Parkinsons disease and disseminated sclerosis, bronchitis and circulatory conditions. A reasonable percentage of patients suffering from

osteo-arthritis and rheumatoid arthritis (Plate 12), showed improvement although it can be seen that this group of patients received more treatment in terms of visits than any of the other conditions referred, Table 9 page 103. Reference to this table gives some indication regarding the suitability for domiciliary physiotherapy of certain medical conditions or diseases. It can be seen that three-quarters of the sample received between one and twelve treatments, which suggests that a course of treatment might be restricted to twelve treatments.

Experience in the out-patient department shows that the average course of treatment is eight to ten attendances based on results from over a quarter of a million attendances. The additional two attendances are considered reasonable in the view of the age and physical condition of the patients in the sample. If there is no improvement following the course of twelve treatments, the patients should be referred back to the doctor. A restriction of this nature is required to limit the expanse of the service and to try and prevent misuse of the service.

During the study of the sample, 24.5% received between 13 and 38 treatments. With this information, plus the figure for the average cost of a physiotherapist's visit, it is relatively simple to predict the likely total cost of a course of physiotherapy treatment for a patient with a particular condition. If the referring doctor considers it justifiable that a patient should receive more than twelve treatments, he can easily estimate the likely cost of such a course of action.

It may be advantageous, in certain instances, to send a domiciliary physiotherapist into a household on a 'once a week' basis rather than to admit the patient to a hospital bed for a number of weeks. There are clinical factors which will influence the decision



Plate 12

Wax treatment to rheumatoid hands can easily be carried out by the patient without supervision in the home. Prior to this the patient may have had to come to hospital for this treatment, often using the ambulance.

Whether the patient should be treated at home and the information provided by this study provides the doctor with a means of comparing the cost of his course of action. Table 18, page 129, shows the total costs involved in both the treatment venues, home and hospital, with either venue costing about the same for this sample studied. If the ambulance is used to bring a patient in to hospital for out-patient physiotherapy treatment the cost of the hospital based treatment is almost trebled. It should be stressed that the cost for a single treatment, as shown here, is artificially high due to the inclusion of research and equipment costs for this sample.

These costs are based on the sample studied and are related to the patient mainly in the sixty-five and over age group. Table 11, overleaf, provides a comparison based on the mean number of treatments received by patients in the study of male, female and ambulance group patients. Male patients received, on average, 7.4 visits in a treatment course, women received 8.2 visits and the patients in the ambulance group made 13.2 visits, on average, to the hospital out-patient physiotherapy department.

The outcome for each of these groups of patients was virtually identical irrespective of the number of treatments they received. The ambulance group consisted of only twenty-five patients and it was considered unwise to draw any firm conclusions with regard to the figures listed above.

The ambulance group presented with eleven separate conditions compared to eighteen separate conditions for the domiciliary group of patients. There was a reasonable spread of conditions in both groups and it might be possible to conclude that in terms of the number of attendances, domiciliary physiotherapy is a more efficient way of providing treatment. A domiciliary patient received, on average,

TABLE 11 : COMPARISON OF OUTCOME OF TREATMENT, THREE GROUPS:
Men, Women, Ambulance Patients (both sexes)

(Aug 1977 - Aug 1978)

	Total Sample MEN	Total Sample WOMEN	Ambulance PATIENTS
Number in sample	61	139	25
Age range	22 - 98	31 - 93	61 - 86
Mean age	72.3	77.6	73.8
No. of treatments	1 - 29	1 - 38	1 - 29
Mean number of treatments	7.4	8.2	13.2
% much better	28%	19%	52%
% slightly better	23%	35%	24%
% no change	13%	8%	12%
% group better*	86%	87%	86%

* completed course of treatment.

30% less treatment than the ambulance patient. When this information is added to the fact that it costs three times as much to provide physiotherapy treatment to an elderly patient, when an ambulance is require to bring him to hospital, it becomes clear that a domiciliary service to this age group is cost effective.

Comparison of 'No Treatment' group, before and after treatment.

Table 12, overleaf, shows the change in condition of the twenty patients in the 'no treatment' group at the end of their three week period without treatment. Four patients were slightly better, two were worse and fourteen showed no change in their condition. Following the three week wait these patients received a course of physiotherapy.

The results of treatment are shown in Table 13, page 119. Six of the patients were much better, seven were slightly better, three showed no change in their condition, one had been admitted to hospital, one transferred to the hospital out-patient physiotherapy department and one was categorised under the 'other' heading. The results showed that, of the patients in this group, 65% had improved following treatment, $P < .001$. When the patients who failed to complete their treatment course were excluded the percentage of patients showing improvement rose to 78%. While it was recognised that the sample was small, these results suggested that patients did derive benefit from their physiotherapy treatment. At this stage it was unclear to what factors these measured improvements might be attributed and it was resolved to investigate this question at a later stage in the study. The average number of treatments constituting a course of treatment in the case of the 'no treatment' group

TABLE 12 : CHANGE IN CONDITION BY MAIN DIAGNOSIS AT END OF THREE-WEEK 'NO TREATMENT' PERIOD (No treatment group).

(Aug 1977 - Aug 1978)

	Much Better	Slightly Better	No Change	Worse	Hospital Admission	Transfer G.D.H.	Transfer O.P.D.	Died	Other
Rheum. arthritis			1						
Osteo-arthritis		2	1	1					
Frozen shoulder				1					
Other pain			2						
Hemiplegia		1	4						
Multiple sclerosis			1						
Other C.N.S.		1	1						
Bronchitis			1						
Circulatory			1						
Fractured femur			1						
Other fractures			1						
TOTAL		4	14	2					

TABLE 13 : OUTCOME OF TREATMENT BY MAIN DIAGNOSIS (No treatment group).

(Aug 1977 - Aug 1978)

	Much Better	Slightly Better	No change	Worse	Hospital Admission	Transfer G.D.H.	Transfer O.P.D.	Died	Other
Rheum. arthritis		1							
Osteo-arthritis	1	2	1						
Frozen shoulder		1							
Other pain	1				1				
Hemiplegia	2	1	1	1					
Multiple Sclerosis		1							
Other C.N.S.	1		1						
Bronchitis		1							
Circulatory	1								
Fractured femur									1
Other fractures							1		
TOTAL	6	7	3	1	1		1		1

was 8.5 treatments which was similar to that for the other groups studied.

COSTS

These were considered in two parts, the domiciliary and ambulance patient costs, each part being sub-divided into sections as shown.

The costs involved in a domiciliary physiotherapy service are borne by a number of parties including the South Birmingham Health District, the patient, the community services team and the DHSS; these are considered under separate headings.

SOUTH BIRMINGHAM HEALTH DISTRICT COSTS

Table 14, page 121, gives details of all the costs that have been identified during the study of the first sample and includes the cost of salaries, superannuation, uniform, travel, stationery, clerical and telephone costs. Other costs include supervision, research costs, visits, teaching of students from various professions and opportunity costs.

Most of the costs shown were easily identified and were recorded as described earlier. The costs of supervision, research and so on were based on estimates. Supervision costs were based on the actual time spent by the author in dealing with the domiciliary physiotherapy staff in connection with the study. Research costs were produced by a simple subtraction of the total costs incurred from the total sum of money available at the commencement of the study period. The resulting figure was assigned to research costs although it did

TABLE 14

COMMUNITY PHYSIOTHERAPY

Actual Costs (Study, Aug. 1977 - Aug. 1978)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
	Salary	31st August 1977 - December 1977 incl. 1 @ £3,717 per annum - £1,548.75
	Salary	January 1978 - May 1978, 2 @ £3,717 per annum - £3,097.50
	Salary	June 1978 - August 1978, 2 @ £3,924 per annum - £1,962. Total £6,608.25
	Superannuation	August 1977 - December 1977 @ 16% - £247.80, January - May 1978 - £495.60
	Superannuation	June 1978 - August 1978 - £313.92 Total - £1,057.32
	Uniform	2 @ £30.00 - £60.00
	Transport	7,349.76 miles @ 14.7 per mile - £1,080.41
	Travelling time	339.09 hours (physiotherapist) @ £2,452 per hour - £831.45
	Treatment time	1,002.03 (physiotherapist) @ £2,452 per hour - £2,456.97 + 170 hours - £416.94 = £2,873.91
	Disposables	Bandages, dressings, collars, felt, pads etc.; minimal quantity.
	Stationery	1196 envelopes @ £2.39/1,000, A4 letterheads @ £3.86/1000, Cards @ £5.18/1000 = £69.64
	Telephone calls	1300 (mean duration 2.7 mts) @ 3p/call = £39.00. 58.5 hours (physiotherapy) - £143.44
	Postage	1196 letters @ 7p/letter = £83.72. 99.66 hours (physiotherapy) = £244.36.
	Clerical	Typing/photocopying, 99.5 hours @ £1.1833/hour - £117.73.
	Supervision/Admin.	150 hours @ £3.82/hour = £573.00
	Opportunity costs	Add 1.5 patients per day = £2.6175 daily, £680.5526 per annum.
	Research costs	Estimated as equivalent to 750 hours @ £2.452 per hour = £1,837.66
	Visits by other staff	50 hours @ £2.452 per hour - £122.6
	Teaching/Lectures	12 hours @ £2.452 per hour - £29.42
	Equipment	£1,300.00
	Meetings	50 hours @ £2,452 - £122.6
	Holidays	Annual leave and statutory holidays expense 462 hours @ £2.452 = £1,130.82

TABLE 15

COMMUNITY PHYSIOTHERAPY

Actual Costs (Study, Aug. 1977 - Aug. 1978)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
PATIENT	Treatment time	42.7 minutes (mean of 1,408 visits)
	Waiting time	30 - 60 minutes at home
	Inconvenience	Minimal
	Embarrassment	Minimal
	Soap and water	1p per treatment
	Electricity	1p per treatment
	Refreshment	10p per treatment
	Loss of Wages	2.5% relatives had given up job to look after patient.
	Loss of Job	N/A patients retired
	Premises	No charge
G.P.	Assessment time	175 visits
	Referral time	175 referrals
	Visits	175 follow-up visits
District Nurse	Telephone	175 calls (estimate)
	Letters	250 letters (estimate)
Consultant	Meetings	25 meetings
	Premises	Nil
G.H.V.	Meetings	25 meetings
	Ambulance costs	Nil

include certain elements such as coffee breaks which was justifiable as much discussion of the work took place during these times.

The opportunity costs were based on an estimate which assumed that a physiotherapist engaged in the community would treat 1.5 patients fewer than her opposite number in the physiotherapy department, assuming that the patients were similar in terms of age and condition. These figures were then extrapolated for the whole year.

The costs of visits, teaching, lectures and so on were based on the time spent by the domiciliary staff in these activities. The cost of meetings was based on the weekly meeting of the geriatric division which was attended by the domiciliary staff.

Patient Costs

These costs were minimal with regard to the domiciliary physiotherapy service and are shown in Table 15, page 122. The waiting time included in this section is based on the usual leeway allowed for traffic hold-ups and other problems. Most patients know what time the physiotherapist was calling and if a delay was unavoidable it was usually possible to contact the patient by telephone.

The time spent receiving treatment might have been spent in some other activity by the patient and could incur some opportunity cost, although this, in the case of the elderly, might be considered as insignificant. The other costs listed were minimal and it is clear that a domiciliary visit costs the patient very little.

Community Services Costs

The involvement of certain staff, listed on Table 15 will have incurred certain costs which have been identified although no attempt

was made at this stage to quantify them in monetary terms as such an exercise was outside the resources of the study.

D.H.S.S. Costs

The same table shows that no monetary value is assigned to this section although all of the costs incurred will eventually come under this category. It might be argued that, as the domiciliary service is a new service, it is therefore an extra cost for the DHSS. To support this argument it would be necessary to identify the extra cost of such a service with the possible benefits of the service traded-off against the costs. It was expected that some indication of the possible final figures resulting from such an exercise might be available upon completion of the study.

Ambulance Patient Costs

These costs were identified in a similar fashion to the domiciliary patient costs and are shown in the table on the pages 125 & 126. The costs listed are based on the treatments and other associated activities carried out during the course of the study.

South Birmingham Health District Costs

Salary, superannuation, uniform and similar costs were obtained in the same way as for the domiciliary costs. The main exceptions were the absence of opportunity costs. There were two extra costs incurred, portering and the cost of providing patients with refreshment. Portering costs were incurred in two ways; one in transferring the patient from the drop-off point to and from the

TABLE 16 : Ambulance Patients COMMUNITY PHYSIOTHERAPY Actual Costs (Study, August 1977 - August 1978)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
South Birmingham Health District	Salary & Superann.	£2.452 per hour, 170 hours @ £2.452 per hour = £416.84
	Uniform	£60.00 pro rata £7.37
	Treatment Time	170 hours @ £2.452 per hour = £416.84
	Waiting Time	32 hours (estimate) @ £2.452 per hour = £78.46
	Disposables	Bandages, dressings, collars, felt, pads etc. minimal quantity
	Stationery	£8.55
	Telephone Calls	£4.89 + £17.98
	Postage	£10.50 + £30.00
	Clerical	£14.79
	Supervision/Admin.	£70.33
	Opportunity Costs	
	Research Costs	£225.56
	Visits	£14.72
	Teaching	£3.67
	Meetings	£14.72
	Portering Costs	£93.60
Refreshments	£29.55	
Equipment	£159.57	
Holidays	£139.76	

TABLE 17 : Ambulance Patients

COMMUNITY PHYSIOTHERAPY

Actual Costs (Study, August 1977-78)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
PATIENT	Treatment Time	51.79 minutes (mean value based on 197 journeys)
	Waiting Time	41.5 minutes (mean value)
	Travelling Time	72.67 minutes (mean value)
	Inconvenience	Waiting at home 100.4 minutes (mean value)
	Embarrassment	Difficult to cost
	Anxiety/Stress	See Text, Chapter 6.
G.P.	Assessment Time	25 Visits
	Referral Time	25 Patients
District Nurse	Visits	25 Re-assessment visits
	Telephone	163 (pro-rata estimate)
G.H.V.	Letters	149 (pro-rata estimate)
	Meetings	2
Consultant	Premises	Physiotherapy Department, 9,866 sq feet @ £1 per sq ft = £10,000 per annum.
	Ambulance Costs	(1977 prices) 0.70p/patient mile vehicle costs + 0.50p/patient mile control costs, Total cost per patient mile = £1.20. Total mileage 1,900 @ £1.20 per mile = £2,280.00

treatment area; the other in transporting the patient from the physiotherapy department in the evening to the pick-up point in the casualty department.

Many patients, during the course of the study, were required to wait at the hospital until quite late for the ambulance to collect them for their journey home, ten o'clock being the latest time recorded. The refreshment was based on the daily supply of tea to patients who had to wait for an ambulance home. The hospital kitchen would occasionally supply sandwiches to patients who missed their lunch because of ambulance waiting.

Patient Costs (Ambulance)

These costs have no monetary values attached at this stage. The costs mainly involved the patients time and as they were mainly retired could not be valued in monetary terms. The table, page 126. shows that treatment, travelling and waiting times were included under this heading. Stress, anxiety and inconvenience were also listed under this section.

Community Services Costs (Ambulance)

These costs were similar to those listed under the domiciliary patients above, but were because of the sample size on a smaller scale.

D.H.S.S. Costs (Ambulance)

There are two major costs involved in a hospital based physiotherapy service; premises and transport. These costs are listed in the table, page 126. The services of a chartered surveyor were obtained to estimate the cost of providing premises similar to those

of the physiotherapy department at Selly Oak Hospital. He estimated that the yearly rental, excluding rates and maintenance charges, would be £10,000.

The second major cost, the transport of patients by ambulance to the hospital physiotherapy department, were based on the actual mileage travelled by the ambulance group of patients and are costed at a figure of £1.20 per patient mile. This figure was the cost for 1977 and a recent newspaper cutting shown, page 172 indicates that the cost has increased since then by about 25%. The figure is composed of two elements, 70 pence per patient mile being vehicle costs and 50 pence per patient mile being ambulance control costs. The total cost incurred during the study for the ambulance transport of twenty-five patients amounted to £3,660.26.

Cost Comparison of the Two Treatment Venues

The actual costs incurred during the study period, August 1977 to August 1978 are shown in the table, page 129. The left hand column contains a list of costs, identified in the preceding pages, the total cost for the domiciliary patient is shown in the third column, the cost for the ambulance patient is shown in the extreme right hand column.

The cost listed against waiting time is the cost of the physiotherapist's time spent waiting for the patient to arrive at hospital. This does not necessarily imply that the physiotherapist, during this time, was idle. The cost against travelling time, includes the petrol expenses of the physiotherapy staff, together with the cost of their time spent in travel. Telephone costs were estimated and were based on a figure obtained by listing all calls made by the staff during three separate one week periods, both in-going and

TABLE 18 COST COMPARISON OF DOMICILIARY AND HOSPITAL PHYSIOTHERAPY (Aug 77 - 78)

ACTIVITY COSTS	DOMICILIARY TREATMENT	TOTAL COST	HOSPITAL TREATMENT	TOTAL COST
Treatment Time	1002.03 hours	2,456.97	170 hours	416.84
Waiting Time			32 hours	78.46
Travelling Time	339.09 hours 7349.76 miles	831.45 1,080.41	238 hrs (patient) 1,900 miles (ambul.)	2,280.00
Uniform	pro rata	52.63	pro rata	7.37
Telephone	1,137 calls @ 2.7 mins. @ 3p/call	125.45 34.11	163 calls @ 2.7 mins. @ 3p/call	17.98 4.89
Postage	1,046 @ 7p Time	73.22 214.30	150 @ 7p Time	10.50 30.00
Clerical	87 hours	102.94	12.5 hours	14.79
Stationery	Items consumed	61.09	Items consumed	8.55
Supervision/ Administration	131.5 hours	502.67	18.5 hours	70.33
Opportunity Costs	Additional 1.5 per day	680.55		
Buildings			pro rata 9,866 sq ft/£1/sq ft	63.55
Research Costs	pro rata	1,612.10	pro rata	225.56
Visits	44 hours	107.88	6 hours	14.72
Equipment	pro rata £1,300	1,140.43	pro rata £1,300	159.57
Meetings	44 hours	107.88	6 hours	14.72
Refreshments			Provided for Patns awaiting ambulance	29.55
Portering			Transfer to and from amb/A+E dept.	93.60
Holidays	pro rata 405 hours	993.06	pro rata 57 hours	139.76
Teaching	10.5 hours	25.75	1.5 hours	3.67
Total		10,202.95		3,684.41
Cost Per Treatment		7.24	18.70*	7.12

* Including ambulance journey

out-going calls being recorded. An average amount was obtained and was extrapolated to cover the whole year of the study period. A similar exercise was undertaken in respect of the postage and letter writing costs.

Opportunity costs were listed only against the domiciliary service and were based on the assumption that the hospital based physiotherapist could treat about 1.5 patients extra per day as described earlier. There may have been a similar opportunity cost in respect of the hospital based treatments but this was not estimated.

The equipment costs, at this stage of the study, were high as several expensive items of equipment had been purchased for the domiciliary physiotherapy service. It was expected that this cost would be discounted over the following years but was written off against this particular sample of patients.

The total costs for each treatment venue was obtained and then was divided by the number of treatments given in each, to provide an average cost of an individual treatment. In the case of the domiciliary service this was the mean of 1408 treatments while the ambulance cost was the mean of 197 treatments. The cost of both treatment venues was found to be about the same unless the ambulance costs were added. In this case the cost of the ambulance based treatment trebled.

The main conclusion which could be drawn at this stage was that a physiotherapy treatment involving an ambulance journey to hospital is expensive and was unlikely to prove cost-effective. When the likely inconvenience experienced by the patient using the ambulance service is added to the fact of the extra cost, it is possible to state categorically: "The practice of ferrying old people to hospital for physiotherapy treatment is uneconomic, inefficient and uncompassionate".

Introduction

This section describes two consecutive samples, each of two hundred patients, which followed the original sample studied. The measurements and assessments used were broadly similar to those described in the second chapter and differences, if any, will be mentioned in the following text.

The first of these two samples was dealt with in exactly the same way as the original sample, already discussed on pages 78 - 130, while the second sample was subjected to a much less exhaustive examination, being used mainly for purposes of comparison. During the period when the latter sample was being collected further subsidiary studies were being carried out and these are described in Chapter V. Numerous difficulties had been experienced in the earlier part of the study which affected the proposed sampling procedure.

During the study of these two samples there were further interruptions which included the work to rule by hospital engineers, the dispute by ambulance drivers and the industrial action by N.U.P.E. There were a small number of ambulance patients within the second sample, numbering seven patients and it was possible to use this group to check travel costs and so on with the findings from the initial sample.

By the time the second sample was being collected, the domiciliary physiotherapy service had become established within the South Birmingham Health District. Doctors using the service had become more selective in their referrals and these included recent strokes, fractures, acute respiratory conditions and certain neurological conditions. All of these factors effectively prevented any attempt to produce three separate groups of patients as planned. In consequence it was considered questionable whether an adequately scientific

study of domiciliary physiotherapy could be carried out as it had not proved possible to provide a sufficiently large control group and the study was being restricted to mainly domiciliary patients.

In spite of this difficulty it was considered that the information being obtained from the samples of patients referred, including the costs and results of various treatment procedures utilised, was itself valuable. Consideration was given to the methods which might be used to quantify the benefits arising from domiciliary physiotherapy treatment and these are described below. At the same time it was decided that a cost benefit analysis, at this stage, would not prove feasible with a group of elderly patients as a sample.

It was still thought that the original format decided upon for the separation of the sample into three groups was potentially useful and a separate study was planned which would be restricted to younger patients with only one referring doctor and only acute spinal conditions being the presenting condition. This study began concurrently with the collection of the third sample and is fully described in Chapter V.

Characteristics Of Second Sample Of 200

This sample was formed by two hundred patients who completed a course of physiotherapy treatment within the period August 1978 to the end of March 1979. The sample included seven ambulance patients and one hundred and ninety-three domiciliary patients.

Although the ambulance section was small, it did represent the type of patient who is referred for out-patient physiotherapy and experience gained during the past ten years with the ambulance service to the physiotherapy department at Selly Oak Hospital suggested that the results obtained from this small sample were fairly typical and showed a marked similarity to the results obtained from the larger sample studied earlier.

Cancellation of the ambulance journey was fairly common with a total of 22 cancellations out of a possible total of 142 journeys, or about 15% which is a three percent improvement on the earlier sample.

While the ambulance service is primarily an emergency service utilising skilled and highly trained personnel who are permanently 'on call', it is probable that the routine transfer of patient to and from hospital for out-patient appointments will be subject to periodic and unscheduled interruptions. Such interruptions not only effectively prevent any suitable randomization of the sample for experimental purposes but also cause considerable strain for the patient and his family.

In spite of the small total of ambulance patients studied overall, ie 32, sufficient evidence was forthcoming to suggest that an alternative to the current service should be provided as a matter of urgency. It may be coincidental that the D.H.S.S. is currently studying possible solutions to this problem. It is worth noting that the experience gained with this ambulance sample and the evidence collected compares with data gathered within the department over the previous ten years when over 75,000 ambulance journeys to the physiotherapy department have been recorded. It is apparent that domiciliary physiotherapy is one method of overcoming the problem with the ambulance service and the question whether such a service is viable in cost benefit terms will be discussed in the final chapter.

Age Range

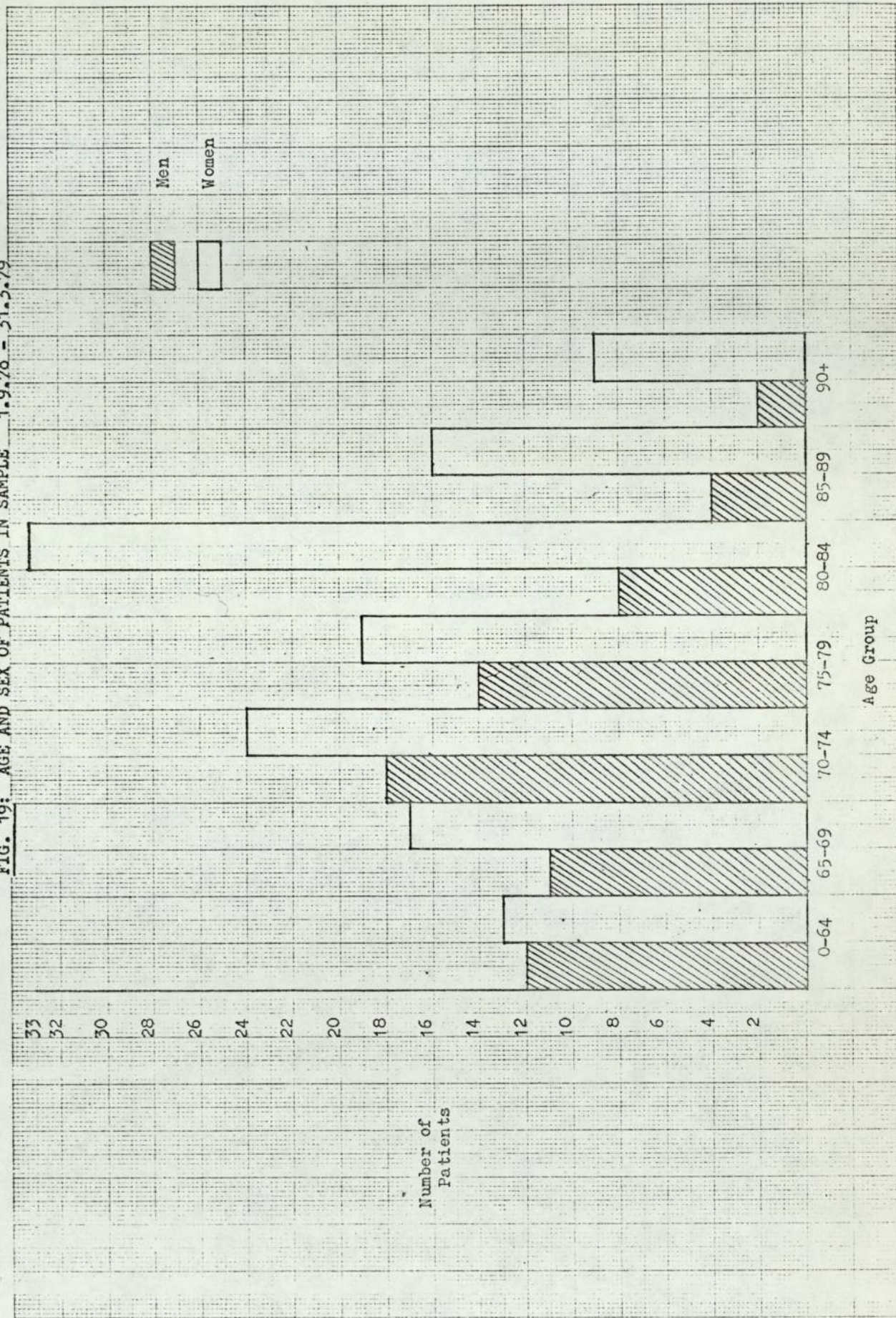
The age range of this sample was predominantly in the 65 and over age group with 88% in this band and the table overleaf shows the size of the various age groups making up the total sample. A comparison with the earlier sample shows that there was a wider age range in this sample although the mean age in both cases in both cases was similar. The

TABLE 19: Age and Sex of Patients in Sample.

AGE	0 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 - 89	90+	TOTAL
MEN	12	11	18	14	8	4	2	69
WOMEN	13	17	24	19	33	16	9	131
TOTAL	25	28	42	33	41	20	11	200
%	12.5	14	21	16.5	20.5	10	5.5	100%

(Sept 1978 - March 1979)

FIG. 19: AGE AND SEX OF PATIENTS IN SAMPLE 1.9.78 - 31.3.79



proportion of the male and female elements were similar for both samples. The patients in the ambulance group of the sample included two men, one aged seventy and one aged eighty, five women aged between sixty-six and eighty four with a mean age of seventy three years.

Sex Distribution

About two thirds of the sample were female patients and this was roughly in line with demographic data for the elderly. The distribution of the sexes in the sample is shown in the table page 135.

Social Characteristics of Sample

Table 20 overleaf, provides information regarding the social characteristics of the patients in the sample. There is also information about the physical condition of the patient in relation to day-to-day living as well as an indication as to the leisure activities and interests of the patients within the sample.

It was found that 28.5% of the sample lived alone, 47.5% lived with a spouse while the remainder lived with a relative. These figures were found to correspond fairly closely with those obtained from the earlier sample. Considerably more patients in this sample owned their living accommodation, 41%, although the figures for council owned property, 48%, were virtually identical to those in the earlier sample. 78.5% lived in a house, 18% lived in a flat and 3.5% lived in other accommodation such as an 'old peoples home'. 37% received a rent rebate and 66.5% had a telephone in the home. 87% were old age pensioners with 24.5% receiving some form of supplementary pension and 5% of the sample had relatives in receipt of an attendance allowance.

Level of Independence

73.5% of the sample required some form of help with their activities of daily living. 43% required walking aids and 24% were either

TABLE 20. Sample Characteristics

Living Alone	Living with Spouse	Living with Relative	Living in House	Living in Flat	Living in Bed-Sitter	Other Accommodation	Self-Owned	Council Property
28.5%	47.5%	24.0%	78.5%	18%	0.5%	3%	41%	48%
Other Landlord	Rent Rebate	Telephone	Geriatric Health Visitor	District Nurse	Home Help	Meals on Wheels	Social Worker	Bus Pass
11%	37%	66.5%	5%	33.5%	29%	8%	5.5%	24%
Other Services	None	Requiring Help	Fully Mobile	Mobile Except Stairs	Walking With Aids	Chair/Bed Fast	Help with Feeding	Help with Dressing
21%	16%	73.5%	20%	8%	43%	24%	16.5%	43.5%
Help with Washing	Previous Hosp. Admiss	Never in Hospital	Discharged last 6 months	Discharged over 6 months	Fully Continent	Occasional Incontinence	Incontinent of Urine	Regular Holidays
48.5%	89.5%	10.5%	25%	64.5%	80.5%	12.5%	7.0%	28%
No Holidays	Old-Age Pension	Supplementary Pension	Attendance Allowance	Regular Interests	No Interests	Eyesight Poor	Hearing Poor	Confusion
58.5%	87.5%	24.5%	5%	79.5%	20.5%	14%	8.5%	16%

(Sept 1978 - March 1979)

chair or bedfast. 48% needed help with washing, 43.5% needed help with dressing and 16.5% needed help with feeding. These figures were very similar to those obtained in the earlier sample.

The level of dependency illustrated by these figures is fairly typical of the problems of the elderly. These findings are similar to those identified by Age Concern (1975) and add support to the belief that the sample studied was representative of a larger population of the elderly. In view of the level of dependency that these figures illustrate, it is surprising that only 5% of the sample were in receipt of an attendance allowance.

Incontinence

80.5% of the sample were fully continent but within the 20% of the sample who suffered from incontinence there were a number of severe problems. One instance illustrated this when a patient, referred because of a severe stroke, was found by the domiciliary physiotherapist lying in her bed without any sheets, the only cover between the patient and the mattress being several copies of a sodden 'Daily Mirror'. There were no clean bed clothes in the house and the few blankets on the bed were wet and soiled with faeces. The patient's husband was old and frail and was unable to maintain any semblance of hygiene.

The physiotherapist provided paper sheets and pillow cases and a supply of incontinence pads. She also arranged a hospital admission but the patient refused to go. This illustrated the attitude of many elderly patients who have expressed horror at the thought of being admitted to hospital, believing that such a step would herald their demise. Although it is not specifically the physiotherapists task to deal with a problem described above, she is often the person in closest

contact with the patient and is equipped to deal with most of the problems encountered.

Services Received by the Patient

33.5% of the patients were being visited by the district nurse while 29% had assistance from a home-help. 8% received meals-on-wheels, 5% were being visited by the geriatric health visitor and 5.5% by the social worker. Only 24% of the sample claimed to have a buss-pass, although only 20% were fully mobile. 21% of the sample were receiving services from other agencies including private home-helps, private physiotherapists, chiropody, hairdressing, voluntary bodies and church visitors. 28% had regular holidays while 58.5% had no holidays. 79.5% had regular interests mainly watching television, reading, gardening, sewing and knitting while 20.5% claimed to have no interests of any kind.

Health State of Sample

89.5% of the sample had been in hospital at some time with 25% having been discharged within the previous six months. 10.5% had never been in hospital. 14% had poor eyesight. 8.5% had poor hearing. 16% of the sample were confused.

Main Presenting Diagnosis

Table 21, overleaf, shows the main presenting diagnosis, by age, for the whole sample. Together with the main diagnosis, 16.5% of the sample had a second clinical disability. The main presenting diagnosis in men was cerebral vascular accident with 38% of the men suffering from this condition, followed by 14.5% with bronchitis and

TABLE 21: Main Diagnosis by Age (Total Sample).

	0-64	65-69	70-74	75-79	80-84	85-89	90+	TOTAL	%
O.A.	1	1	9	5	13	4	3	36	18%
C.V.A.	7	15	14	15	6	6	2	65	32.5%
R.A.	4	1	3		5			13	6.5%
Other Disease	4	2	3	5	8	4		26	13%
Other Ortho.	1	1		1	5	2	3	13	6.5%
Fract. Femur	1	1	3			2		7	3.5%
Parkinsons			2					2	1%
Hip Operation						1		1	0.5%
L.B.P.		3	1	1			1	6	3%
Other C.N.S.	3	1	1	1				6	3%
Fract. Humerus				1	2			3	1.5%
D.S.	3							3	1.5%
C. Spond.							1	1	0.5%
Circulatory		1			1			2	1.0%
Other Fracts.			1					1	0.5%
Pain.						1		1	0.5%
Bronchitis		1	5	3	1		1	11	5.5%
Other Resp.	1	1						2	1.0%
Amputee				1				1	0.5%
TOTAL	25	28	42	33	41	20	11	200	100%

(Sept 1978 - March 1979)

FIG.20 : MAIN PRESENTING DIAGNOSIS (MEN)

1.9.78 - 31.3.79

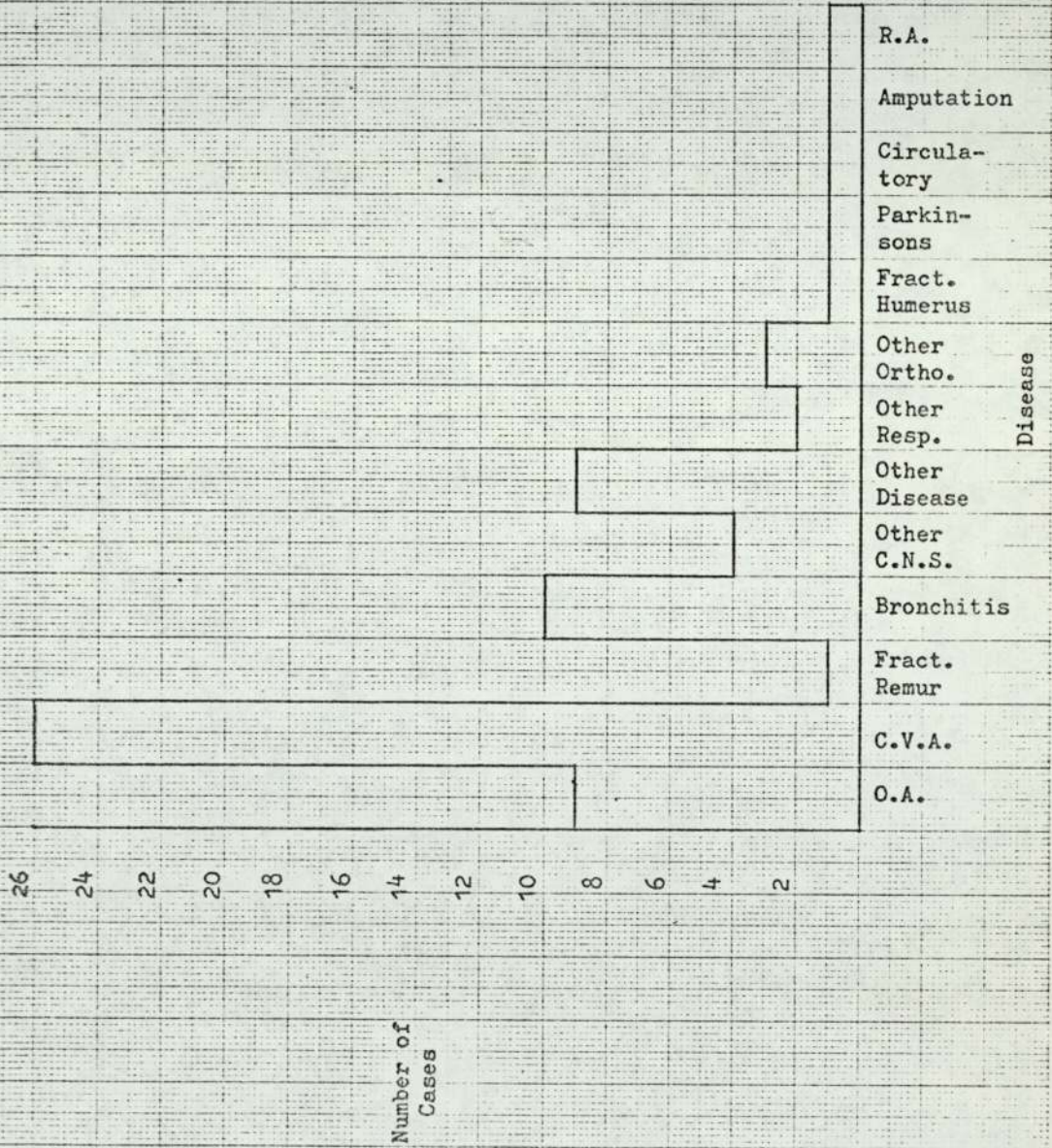
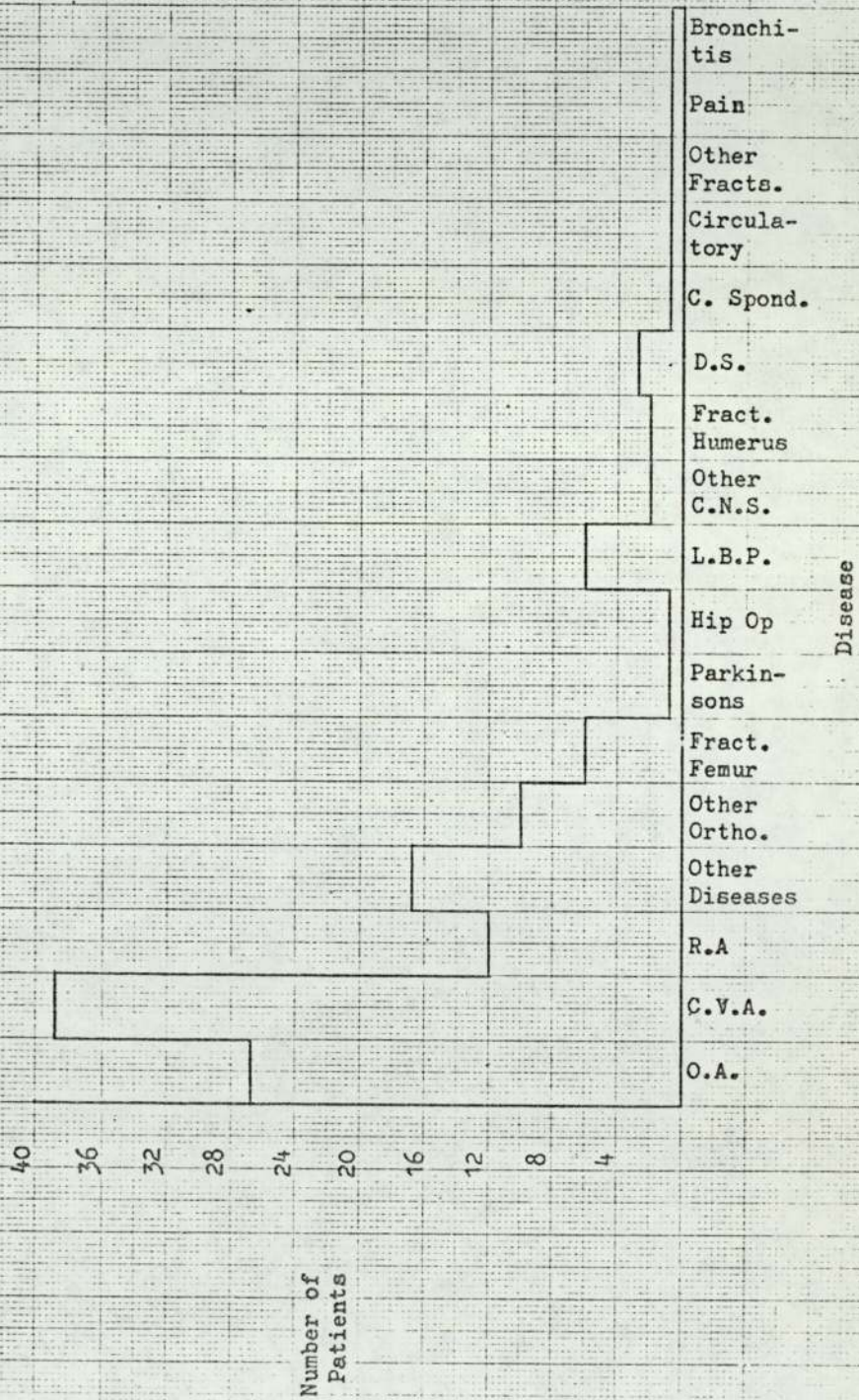


FIG. 21 MAIN PRESENTING CONDITIONS (FEMALE)

1.9.78 - 31.3.79



13% with osteo-arthritis and 13% with 'other' conditions such as paraplegia and stab wounds. The remainder presented with a variety of conditions including orthopaedic conditions, CNS disease, respiratory disease, Parkinsons disease as shown in the table on page 140.

The main presenting diagnosis in the case of women was also cerebral vascular accident with 30% of the sample. Osteo-arthritis was the next most frequent diagnosis with 21% of the sample, while 'other' disease was 13% followed by rheumatoid arthritis with 9% and orthopaedic conditions with 7% of the sample. In keeping with the previous sample, disseminated sclerosis was restricted to the females while respiratory conditions were mainly confined to the males.

Discussion

The bulk of the referrals are made up of CVA, osteo-arthritis and orthopaedic conditions which formed over 63% of the sample. Table 25, page 152, indicates the outcome of treatment by main diagnosis for the sample and it can be seen that the percentage of patients in each of the above categories, showing a favourable response to treatment was 58% in the case of osteo-arthritis, 38% in the case of CVA and 50% in the case of patients with orthopaedic conditions.

The sample as a whole showed a favourable response to physiotherapy treatment in 46.5% of the patients, irrespective of condition. Many of the other conditions showed a much more favourable response to treatment, 100% improvement in circulatory conditions, but the numbers suffering from these conditions were small. The three major conditions referred are all liable to severely affect the functional

capabilities of the patient and their presence in this proportion in the sample is an indication of the need for some form of physiotherapy treatment.

A domiciliary service must compete for finance against other community services and some form of cost benefit analysis was clearly required before any firm recommendations could be made regarding the provision of a domiciliary physiotherapy service.

Taking stroke patients as an example, it can be seen that a third of the patients referred improved while being nursed at home. In cases where there was no measurable improvement, an improvement in the morale of the relatives was evident, although not measured, and a proportion of patients showing improvement of 1:3 might not be regarded as very strong evidence in support of a domiciliary physiotherapy service. It must be stressed that many of the patients referred were extremely ill and if a service such as this had not been available, many may have been admitted to hospital. As the service was not restricted to the stroke patient it would be unreasonable to judge its value on one condition unless a specific study were made which was restricted to stroke patients. A statement by Brocklehurst (1978)(a) that much of physiotherapy treatment in the case of cerebro-vascular accident is futile seems to be supported by the figures shown in this study although comment such as this will depend upon the criteria by which the treatment is valued. It is clear that within the group of patients showing no improvement, the withdrawal of physiotherapy support would have resulted in early hospital admission, for a significant proportion of these patients.

There is no evidence to support this statement other than the recorded and minuted comments of the consultant and district nurse members of the Geriatric Management Team, South Birmingham Health District.

Source of Referral

Table 22, overleaf, outlines the source of referral, the bulk of which have been made by the GP. 32% came from the consultant and the remaining 18.5% from the district nurse, geriatric health visitor, social worker and from other physiotherapy departments.

There has been a considerable increase in consultant referrals in this sample, including geriatricians, orthopaedic surgeons and physicians. The considerable reduction in referrals, 20%, from other agencies has reflected the policy to restrict, as far as possible, all referrals to the medical staff in an attempt to reduce the number of 'unsuitable' referrals. The links with the geriatric and with the orthopaedic divisions are being extended and there is a well established link between the hospital and community service. The domiciliary physiotherapy staff continue to attend the weekly geriatric team meeting and a domiciliary physiotherapist attends a weekly orthopaedic out-patient consultant clinic. This allows the surgeon to ensure effective follow-up for elderly patients who are discharged from hospital. He was also able to discharge his orthopaedic post-op patients earlier, in the knowledge that adequate physiotherapy would be available within the home.

This link with the orthopaedic service is likely to become increasingly significant, in view of the very long waiting list for orthopaedic surgery within the Area Health Authority, BAHA Report (1979)(b). The presence of 13% of patients with orthopaedic conditions within the sample is an indication of the co-operation between the domiciliary physiotherapy service and the orthopaedic division.

The referral system can act as a two-way link as the doctor has shown himself to be prepared to accept the recommendation of the physiotherapist regarding the condition of a patient and will arrange a hospital admission on the advice of the domiciliary physiotherapist.

Table 22; Source of Referral, Total Sample

General Practitioner	Hospital Consultant	District Nurse	Geriatric Health Visitor	Physiotherapy Department	Social Worker
99	64	17	6	13	1
49.5%	32%	8.5%	3%	6.5%	0.5%

(Sept 1978 - March 1979)

Treatment Procedures

Table 23, page 149, shows the range of treatment procedures used during the study of this sample. Patients may have received more than one procedure during a call by the physiotherapist. 96% of the patients received an assessment and advice of some kind while 76.5% were taught exercises, with most of them being given an appropriate instruction sheet. The presence of a relative was found to be very valuable and there was evidence that the relative enjoyed supervising the exercise programmes.

Ultrasound was the most frequently used physical agent with 10.5% of the sample receiving this treatment. Heat and inter-ferential therapy with 6.5% and 5.5% respectively were the two next most frequently used procedures. The remaining procedures, heat, wax, massage, traction, SWD and low frequency current constituted a small group of 3.5% in all.

As can be seen, more than three quarters of the sample had exercises and advice as the treatment and it is clear that a domiciliary physiotherapy service can be provided without a great deal of equipment.

Number of Treatments Given

Table 24, page 150, provides information regarding the number of treatments given in the case of each condition referred. With a few exceptions the bulk of the sample received 12 treatments or less. The most frequent, 10% of the sample, was a single visit to the patient with a hemiplegia where an assessment would be made. This could result in a referral to the day-hospital, admission to hospital or in a decision that treatment was unnecessary.



Plate 13

Ultrasonics treatment is particularly suitable for domiciliary treatments as it is effective and the equipment is light and portable. This patient is having a haematoma on the thigh treated by ultrasound.

TABLE 23

Treatment Procedures, Whole Sample

(Sept 1978 - March 1979)

	MEN	WOMEN	TOTAL	%
Assessment and Advice	68	124	192	96%
Exercises	53	100	153	76.5%
Ultra-sonics	1	20	21	10.5%
Heat	2	11	13	6.5%
Interferential	1	10	11	5.5%
Massage		3	3	1.5%
Wax		1	1	0.5%
Traction		1	1	0.5%
S.W.D.		1	1	0.5%
Low Frequency Current		1	1	0.5%
No Treatment	1	7	8	4%

TABLE 24: Number of Treatments, by Condition. Total Sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	30	36	41	NO Rx
O.A.	5	2	2	5	1	3		3	3	2	2	3	2	2												1
R.A.	2	1	1	2			3		1					1								1				1
C.V.A.	20	5	7	8	4	2	3	4			3		1	3	1		1		1		1				1	
Other Dis.	8	5	3	2	1		1		2	1													1			2
Other Orth.	2	1		3	1	3					1		1	1												
Frac. Femur	2	1	2									1		1												
Parkinsons	2																									
Hip Op.		1																								
L.B.P.								1			2	2									1					
Other C.N.S.	1	2		1							1	1														
Frac. Hum.											1	1					1									
D.S.	2													1												
C. Spond.										1																
Circulatory				1						1																
Other Frac.	1																									
Pain								1																		
Bronchitis	1	3	3		1	1						2														
Other Resp					1	1																				
Amputee							1																			
TOTAL	46	21	18	21	10	10	8	9	6	5	10	10	4	9	1		2		1	1	1	1	1	1	1	3

(Sept 1978 - March 1979)

Patients with osteo-arthritis received an average of 5.6 visits and there was one patient who received 41 treatments before discharge. She was an ambulance group patient who was suffering from a number of painful joints with strong overlay and her GP decided that an extended course of treatment was required

Patients with orthopaedic conditions had an average of 6.25 treatments with a measurable improvement in 50% of the cases which, at the cost existing when they were treated, just over £36.00 per case. When it is appreciated that this is just over the average daily cost for an orthopaedic bed, it suggests that domiciliary physiotherapy could be cost effective when used for such patients. It is equally important that the patients are able to convalesce in the familiar surroundings of their own homes.

A comparison of the ambulance group with the domiciliary group of patients shows that the average number of attendances for the former was 17 while for the latter was 5.6. This figure is artificial as one of the ambulance group had 41 treatments and the group was significantly smaller. It does compare with the findings of the previous sample which showed that the ambulance patient received nearly twice as much treatment as the domiciliary patient. This suggests that a domiciliary treatment might be more relevant to the patient and for this reason produces a quicker result.

Outcome of Treatment

Table 25, overleaf, shows the treatment outcome for the whole sample of 200 patients and these results are considered under two groups, Group 1 included ratings in the following categories:

Much better, slightly better, no change and worse.

TABLE 25: Outcome of Treatment by Main Diagnosis (Total Sample).

	MUCH BETTER	SLIGHTLY BETTER	NO CHANGE	WORSE	HOSPITAL ADMISSION	TRANSFER G.D.H.	TRANSFER O.P.D.	DIED	OTHER
O.A.	6	15	4	1	6				4
C.V.A.	15	10	9	1	8	4		4	14
R.A.	2	3	3		2	1	1		1
Other Disease	3	6	6		3	3	1	1	3
Other Ortho	4	2	2		4	1			
Fract. Femur	2	1	2						2
Parkinsons					2				
Hip Operation					1				
L.B.P.	2	3	1						
Other C.N.S.	1	1	3		1				
Fract. Humerus	2	1							
D.S.	1	1					1		
C. Spond.		1							
Circulatory	1	1							
Other Fracts.									1
Pain			1						
Bronchitis	2	5	1		1			1	1
Other Resp.		2							
Amputee.			1						
TOTAL	41	52	33	2	28	9	3	6	26

(Sept 1978 - March 1979)

FIG. 22: OUTCOME OF TREATMENT BY MAIN DIAGNOSIS (TOTAL SAMPLE)

1.9.78 - 31.3.79

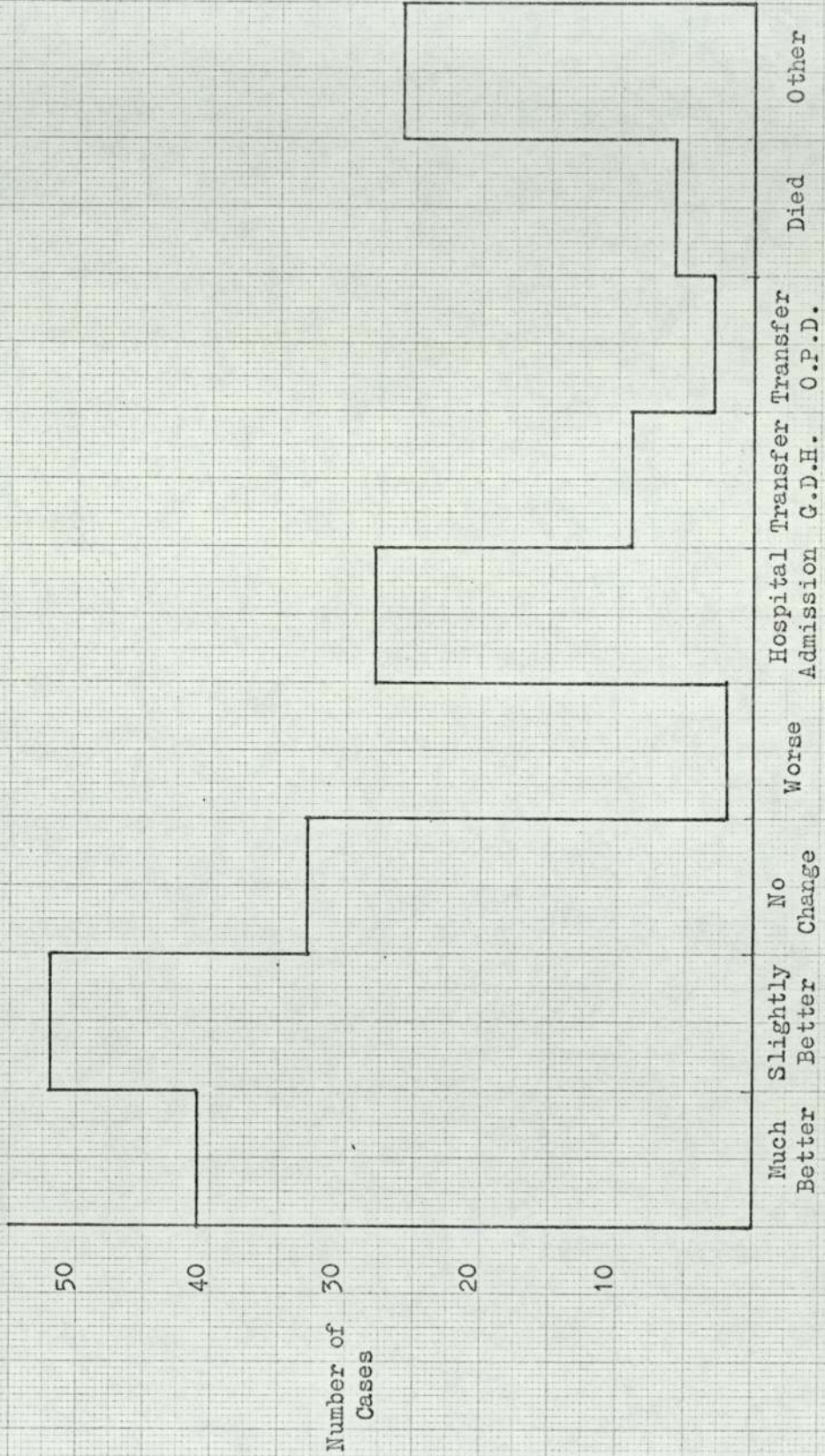


TABLE 26: Outcome of Treatment, by Age, Whole Sample.

	MUCH BETTER	SLIGHTLY BETTER	NO CHANGE	WORSE	HOSPITAL ADMISSION	TRANSFER G.D.H.	TRANSFER O.P.D.	DIED	OTHER
0 - 64	6	4	5		4		3		3
65 - 69	7	9	1		4	3		1	3
70 - 74	6	5	10		9	3		4	5
75 - 79	8	9	4	1	3	1		1	6
80 - 84	7	17	9		3	1			4
85 - 89	3	4	4	1	3	1			4
90+	4	4			2				1
TOTAL	41	52	33	2	28	9	3	6	26

(Sept 1978 - March 1979)

TABLE 27: Outcome of Treatment, by Sex. Whole Sample

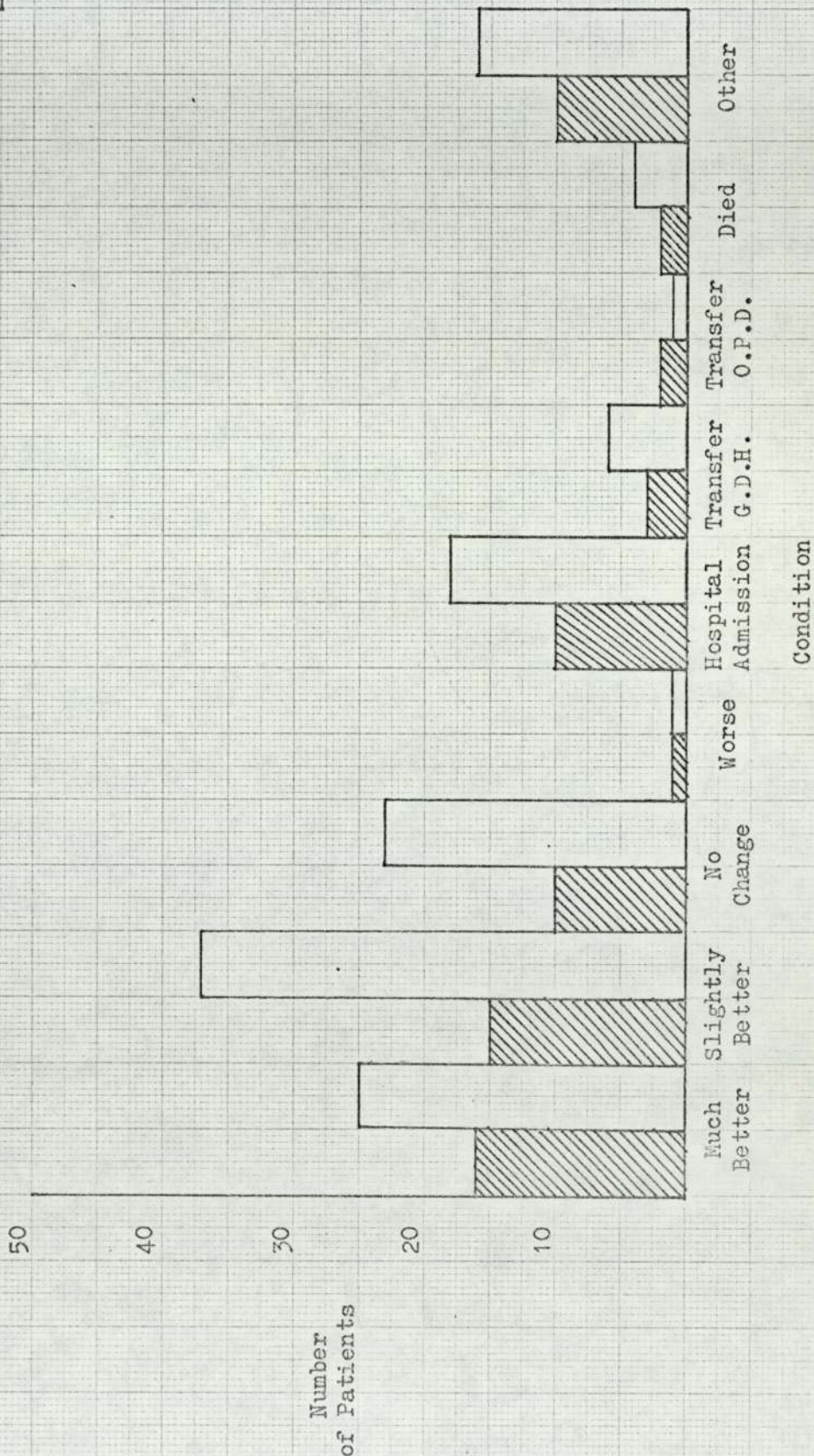
	MUCH BETTER	SLIGHTLY BETTER	NO CHANGE	WORSE	HOSPITAL ADMISSION	TRANSFER G.D.H.	TRANSFER O.P.D.	DIED	OTHER
MEN	16	15	10	1	10	3	2	2	10
WOMEN	25	37	23	1	18	6	1	4	16
TOTAL	41	52	33	2	28	9	3	6	26
%	20.5%	26%	16.5%	1%	14%	4.5%	1.5%	3%	13%

(Sept 1978 - March 1979)

FIG. 23; COMPARISON OF OUTCOME OF TREATMENT, BY SEX.

1.9.78 - 31.3.79

Men
Women



Group 2 patients include:

hospital admission, day-hospital transfer, out-patient transfer, died and those classified as 'other'.

Group 1 Patients

The assignment to one of the four outcomes within this group was dependent upon the rating by the patient of his progress which, if confirmed by an independent physiotherapist using the available assessment methods, was recorded and the patient assigned to the particular outcome. This method of grading is in line with the consumer sovereignty approach, described earlier.

In certain conditions treated there was a 100% success rate, for example fractured humerus, cervical spondylosis, DS and with circulatory conditions. Broadly speaking orthopaedic patients showed improvement in 83% of the cases for those patients who completed their treatment course. This level of improvement for hemiplegia patients who completed their course of treatment was 71% of the group. Only 40% of the patients who were referred as paraplegia, motor neurone disease and other neurological conditions showed measurable improvement. In the no change and worse categories, stroke patients showed 29% followed by patients with arthritic conditions.

Table 27, page 155, shows the outcome of treatment for either sex and 73% of the men and 72% of the women, who completed their course of treatment, showed improvement.

Table 26, page 154, shows that patients in the age group 90 and above showed improvement in all cases while patients in the 65-69 age group showed improvement in 94% of the cases while patients in the 85-89 age group achieved improvement in 78% of the cases completing a course of treatment.

Group 2 Patients

Patients who failed to complete a course of physiotherapy treatment are included in this group. 14% were admitted to hospital, 4.5% were transferred to the day-hospital, 3% died, 1.5% were transferred to the out-patient physiotherapy department, while 13% were assigned to the 'other' category.

In the previous sample studied, 15% were admitted to hospital, 6.5% were transferred to the day-hospital, the same number were transferred to the out-patient department, 2.5% died and 10.5% were transferred to the 'other' category. In the case of group 2 patients there was a strong similarity between the first and second sample studied.

Comparison of Travel and Waiting Times

Table 28, overleaf, shows the time involved for each treatment venue as well as showing the distances travelled and the treatment time for both domiciliary and ambulance treatments. The table is based on a total of 1094 domiciliary visits and 120 ambulance journeys and the values listed are mean values. As can be seen the ambulance patient spends about 56 minutes travelling, 60 minutes waiting to return home and about 55 minutes in treatment. The time shown against waiting at home is the average time elapsed from the booked time to the time when the ambulance actually arrived to collect the patient for his journey to hospital. A domiciliary patient does not require to travel and any waiting time is spent in their own home. If the physiotherapist is unable to keep to her pre-arranged appointment time, the patient is notified, where possible, by telephone.

The physiotherapist spends on average 15.5 minutes travelling for each visit over a distance of about 5 miles. The travelling

TABLE 28: Comparison of Travel Times, Treatment Times, Waiting Times, Domiciliary and Ambulance Patients (Mean Values).

	Domiciliary Patient	Ambulance Patient
Total travel time	15.52	56.24
Total waiting time - hospital	nil	60.23 mts
Total distance	5.08 miles	6.85 miles
Total treatment time	40.40	54.69 mts
Wait at home	variable	90.6 mts
Cancellations	nil	3.14

Based on 120 ambulance journeys, and 1094 domiciliary visits
(Sept 1978 - March 1979)

FIG 24: Comparison of Travel Times, Treatment Times, Waiting Times, 1.9.78 - 31.3.79
 Domiciliary and Ambulance Patients (Mean Value)

Domiciliary Patients

Ambulance Patients

Minutes

60

50

40

30

20

10

Travel Time

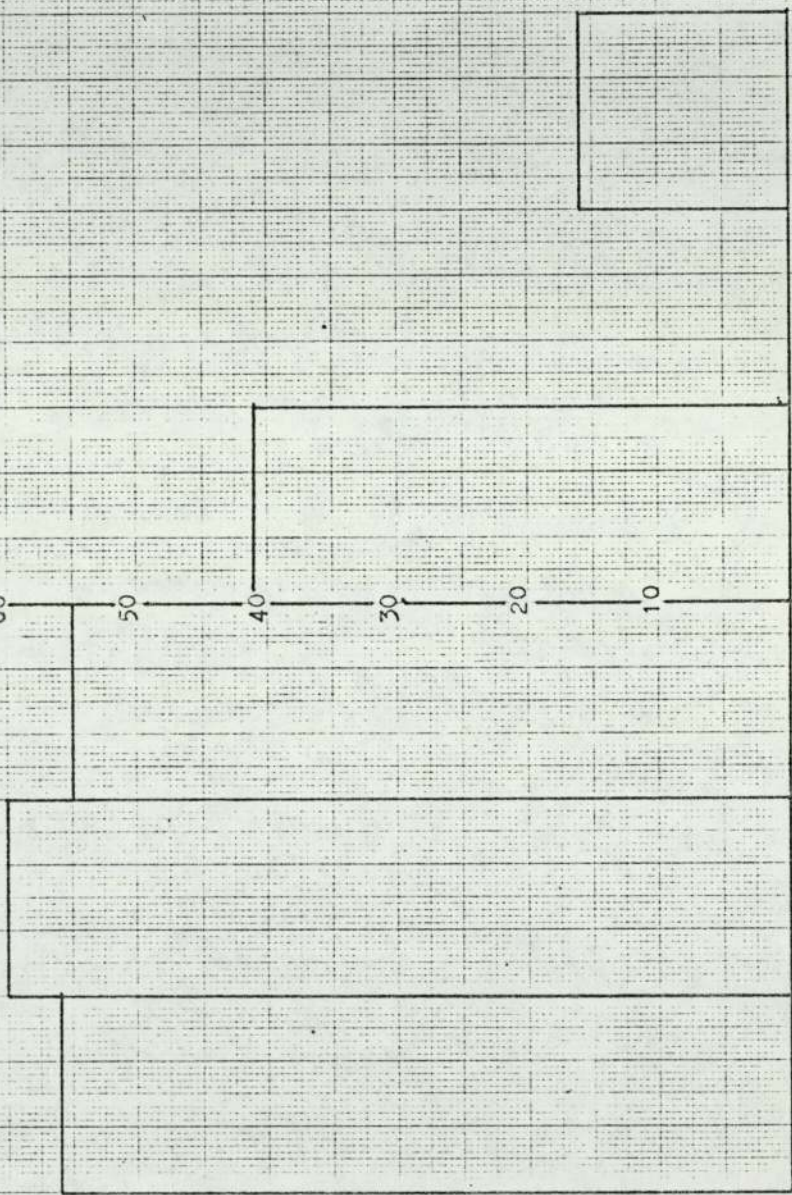
Waiting Time

Treatment Time

Treatment Time

Waiting Time

Travel Time



time and distance covered for each treatment compares closely with the original sample findings for the domiciliary patient. The ambulance travel time has improved although the waiting time has increased. There was a slight reduction in cancellations by 3% for the second sample which entails an average of three cancellations for each patient in the ambulance sample. The fatiguing effect of travelling in the ambulance coupled with the strain involved in sitting waiting for it to arrive is extremely tiring for the elderly unwell patient.

Costs of Treatment

Tables 29 - 32 provide details of the various costs incurred by both the domiciliary and the hospital based physiotherapy service. This information is sub-divided into two sections, the first giving information about the domiciliary service costs, the second part deals with the ambulance patient costs. A comparison of the two alternative treatment venues is given on page 173.

Domiciliary Service-Costs

These costs are borne by a number of parties including the South Birmingham Health District, the patient, the community team, the D.H.S.S. and the domiciliary physiotherapy staff.

South Birmingham Health District Costs

These costs are shown in the tables following, and include all of the costs that have been identified during the course of the study of the second sample. These costs are relatively easily

TABLE 29

COMMUNITY PHYSIOTHERAPY

Total Costs (Whole Sample) 1.9.78 - 31.3.79

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
	Salary	2 @ £4,248.00 per annum £4,956.00
	Superannuation	2 @ £680 per annum £793.00
	Uniform	2 @ £30.00 per £35.00
	Transport	5553.5 miles @ 8.4p per mile plus 2 regular user allowance @ £169.00 per annum £663.65
	Travelling Time	283 hours @ 263 pence per hour £744.29
	Treatment Time	736.75 hours @ 263 pence per hour £1,937.65
	Disposables	4 packs Inco pads £21.00 1 cervical collar £1.28 6 boots £27.00 = £49.28
	Stationery	270 envelopes @ £2.39 per 1000. Letterheads @ £3.86 per 1000. Total £1.68
South	Telephone Calls	364, mean duration 4.5 minutes, £10.92. Physiotherapy time 27.3 hours £71.79.
Birmingham	Postage	270 letters @ 8p per letter, £21.60, Physiotherapy time £94.68 (36 hours).
Health	Clerical	Typing, telephone messages, photocopying. 90 hours @ £1.1833 per hour £106.49.
District	Supervision / Admin.	125 hours @ £3.82 per hour £477.50.
	Opportunity Cost	Extra 1.5 patients per day £690.63.
	Research Costs	Estimated as equivalent to 88 hours £231.44
	Visits	30 hours, £78.90
	Teaching/Lecturing	14 hours, £36.82
	Equipment	1 IPPB Machine £260.00 + £1137.50 x 1/3 (see text) = £402.18
	Meetings	121 hours @ £2.26.94 per hour £318.23
	Hospital Based Treatment	125.5 hours @ £2.26.94 per hour £330.06
	Hospital Waiting	16.6 hours @ £2.26.94 per hour £43.65
	Time Spent In Other Rx	412 hours @ 2.63 per hour £1,083.56
	Report Writing	48 hours £126.24
	Holidays	36 days = £662.76

Domiciliary Service TABLE 30 : COMMUNITY PHYSIOTHERAPY Actual Costs (Study: Sept 78 - April 79)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
Patient	Treatment Time	40.4 minutes. (Mean of 1094 domiciliary visits).
	Waiting Time	Variable (see text)
	Inconvenience	Minimal (see text)
	Washing facilities	Estimated 1p per treatment.
	Electricity	Estimated 1p per treatment.
	Refreshment	Estimated 10p per treatment.
	Loss of wages	Nil as none working.
	Premises	No charge.
	Assessment time	193 visits.
	Referral time	193 referrals.
G.P. Consultant	Visits	Follow-up visits.
D.N.	Telephone	193 calls (estimate)
G.H.V.	Letters	193 letters (estimate)
Social Worker	Meetings	30 meetings (estimate)
D.H.S.S.	Premises	Minimal
	Ambulance Costs	Nil

Ambulance Patients

TABLE 31 : COMMUNITY PHYSIOTHERAPY

Actual Costs (Study 1.9.78 - 31.3.79)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE
	Salary & Superannuation	£2.63 per hour 125.5 hours £330.06
	Uniform	Pro rata £ 3.46
	Treatment time	£330.06
	Waiting time	16.6 hours £ 43.65
	Disposables	Inco pads, collars, boots £ 4.88
	Stationery	0.17
	Telephone Calls	Time plus salary costs £ 8.18
	Postage	Time plus stamps £ 11.50
	Clerical	Time £ 10.53
	Supervision/Admin.	Time £ 95.50
	Opportunity Costs	Nil (see text)
	Research Costs	Pro rata £ 26.78
	Visits	Pro rata £ 7.80
	Teaching	Pro rata £ 3.64
	Lectures	Included above
	Portering	Time estimate 120 visits £ 57.01
	Refreshments	10p per treatment £ 12.00
	Equipment	Pro rata to £30,000 £100.00
	Meetings	Pro rata £ 19.72
	Report Writing	Pro rata £ 12.48
	Holidays	

Ambulance Patients
 TABLE 32 : COMMUNITY PHYSIOTHERAPY
 Actual Costs (Study 1.9.78 - 31.3.79)

PARTY	ACTIVITY COSTS	QUANTIFICATION MEASURE	
Patient	Treatment Time	54.69 minutes (Mean value based on 120 journeys)	
	Waiting Time	60.23 minutes (Mean value based on 120 journeys)	
	Travelling Time	56.24 minutes (Mean value based on 120 journeys)	
	Waiting Time At Home	90.6 minutes (Mean value based on 120 journeys)	
	Inconvenience	90.6 minutes and cancelled journeys	
	Anxiety	see text. Mean of 3.14 cancellations for each patient.	
	G.P. Consultant	Assessment Time	7 visits
		Referral Time	7 visits
Visits		7 visits	
D.N.	Telephone	Pro rata estimate 171	
G.H.V.	Letters	Pro rata estimate 27 estimate	
	Meetings	Pro rata 7.5 hours	
	Premises	Physiotherapy Department 9.866 sq ft @ £1.00 per sq ft repairing	
	Ambulance Costs	804 patient miles @ £1.20 per mile £964.80	
D.H.S.S.			

identified using the same methods as described for the original sample. These costs are the actual amount paid in salary, superannuation, uniform, travel and so on for the two physiotherapists who worked with the sample described.

The percentage of time spent in travelling has increased for the second sample by 4% to 38% of the treatment cost. This increase could be attributed to the fact that the second sample was treated over the period of winter and the staff involved had to face the hazards of icy roads, in fact carrying shovels in their cars for a period during the study.

There was a reduction in stationery costs for the second sample, due in part to the reduction in letter writing, because of the suspension of the randomization process, although the time taken to write a letter had increased by 20% from 4 minutes per treatment to 5 minutes per treatment in the second sample. There was a reduction in the number of telephone calls and in the time spent making them of about one minute for each treatment given. Supervision costs and clerical costs were broadly similar for both samples and the opportunity cost was based on the same formula which was used in the first sample. Research costs are reduced although teaching costs were increased due to a significant increase in the number of medical students accompanying the physiotherapists.

There was a marked increase in the cost of meetings, the time increasing by about 5 minutes per treatment. This may have been due to the fact that both physiotherapists attended the weekly meeting of the geriatric division. The cost of waiting for ambulance patients to arrive at the hospital was 16.6 hours which was not recorded separately for the original sample. Equipment costs were greatly reduced as only one major item of equipment was purchased. The total sum spent on equipment was divided by eight, as the life of this

equipment is considered to be eight years. The resulting sum is the amount which was ascribed to the section 'equipment costs'.

One final cost, shown against the second sample, is under the heading 'time spent in other treatments'. This covers the cost of treating patients outside the sample studied, due to overlap with the tailing off period and to the time spent by the domiciliary physiotherapy staff involving on-call duties in the hospital rota for evening and Saturday morning duties. The cost for visits showed a slight reduction for the second sample.

Patient Costs

The cost to the patient of a domiciliary visit is negligible and may include electricity, washing facilities, refreshment and the provision of premises. The likely cost of electricity was estimated at about 1p per treatment. It was noticeable that a clean towel was usually laid out for the physiotherapist and it was estimated that there was an average of 10 pence per visit spent on refreshments.

The physiotherapy staff have observed that their consumption of tea or coffee could involve them in half their working day and they restrict their coffee break to one in the morning and one in the afternoon, unless there is a patient who they feel requires time to confide in them. Treatment time could be thought to have some element of opportunity cost although, in the case of the retired, this cost is likely to be marginal.

Community Services Costs

There is some element of cost for the various professional staff within the community. These costs include assessment time, referral time, visits, telephone and postage costs and meetings costs.

The difficulties involved prevent quantification and they are merely identified as shown.

D.H.S.S. Costs

There are no premises costs involved in the domiciliary physiotherapy service although an estimation was made for equipment storage costs which was less than £2.00. There were no costs incurred in bringing a patient by ambulance to hospital.

Physiotherapy Staff Costs

There are a number of costs which are borne by the physiotherapy staff who work in the domiciliary physiotherapy service.

The major cost is the purchase and running of a second family car. The usual running costs are covered by the regular users allowance and mileage allowance which was £169.00 per annum and 8.4 pence per mile, during the course of the study. This allowance will pay for the tax, insurance and average servicing and repairs. The regular user allowance was increased during the final month of the second sample to £234.00 per annum with a mileage payment of 10.2 pence per mile. The two physiotherapists who treated the patients described in the sample would have received roughly identical amounts, regular user allowance for seven months £136.50 plus a total mileage payment of £233.24 giving a total sum of £359.74. Against this income each physiotherapist spent just over £100.00 for petrol, £150.00 in tax and insurance, £20.00 on replacement tyres, £61.00 for MOT and repairs, and £41.00 for servicing, giving a total of £372.00 for the period. This amount does not include a minor accident damage or a replacement clutch, nor is there an element for depreciation.

It is recognised that the staff involved have got the use of the car for private purposes but it is clear that it will prove increasingly difficult to recruit staff to work in the community unless this burden of car purchase and maintenance is removed as they are in fact subsidizing the patient's treatment. They have also had to wait for periods of up to three months for repayment of their petrol expenses which are paid in arrears. There is also a non monetary cost which is composed of the physical and mental effort in dealing with rush hour traffic, delays, parking difficulties, wrong addresses and, during the course of the study, the petrol tankers dispute, which entailed long waits in queues for petrol.

If taken individually these are relatively minor problems but there can be a cumulative effect which in certain instances can lead to psychological strain, Frazer (1978)(g).

AMBULANCE PATIENT COSTS

These are outlined in the same way as for the domiciliary costs and are based on a pro-rata estimate where appropriate. Certain costs for the South Birmingham Health District are identified which are not incurred by the domiciliary service, notably portering costs and refreshment costs.

Patient Costs

These include treatment time, waiting time, travelling time, inconvenience and anxiety. It could be argued that the cost of time to a retired person is relatively insignificant. The total time elapsed for an ambulance patient attending for a hospital treatment was just over four hours which was nearly seven times as long as the time involved in a domiciliary physiotherapy treatment.

The financial value of such a disparity cannot be enumerated but it is clearly unreasonable that any patient irrespective of age should be subjected to the strain associated with travel to and from hospital by the ambulance.

Community Services Costs

These are shown under the appropriate heading and are, in common with the domiciliary service, merely listed.

D.H.S.S. Costs

There are two major costs incurred by a hospital based physiotherapy service, premises and ambulance transport, which are absent in a domiciliary service. A chartered surveyor provided the estimate for the premises cost, as shown overleaf, and although such a cost is not ordinarily shown in Health Service costing, it forms a significant element in the true cost of any service. The ambulance costs are a major factor in any decision making regarding the provision of any domiciliary service. The ambulance costs listed here are the actual costs incurred by the patients in the ambulance sample. The figure on which the estimate was based is a 1977 figure for the cost of the ambulance journey and a recent newspaper report shows that this amount has increased by an amount similar to the inflation rate to £1.50 per patient mile, page 172.

Cost Comparison of Treatment Venue

These are shown on page 173, with the left hand column containing a list of the costs for each activity, domiciliary costs shown in column three and ambulance costs shown in the final column.

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Estate Manager: F.T. Weston, MSST
Secretary: H. Hammond

our reference: JCA/VJG
your reference:

13th November 1978

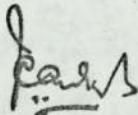
F.W. Frazer, Esq.,
Physiotherapy Department,
Selly Oak Hospital,
Birmingham, 29.

Dear Mr. Frazer,

I confirm today's telephone conversation when I advised you that in my opinion, if you were required to take a tenancy of premises equivalent in all respects to those at present occupied by your Department, the rent you would have to pay, representing the present market value, would be in the region of £10,000 (Ten thousand pounds) per annum, based upon the assumption that the tenant was additionally responsible for the payment of General and Water Rates and the Repair of the premises and that no equipment other than the basic fittings is to be included in the letting.

If I can help further please let me know.

Yours sincerely,



J.C. ANKCORN FRICS

FIG. 25

SURVEYOR'S VALUATION OF PHYSIOTHERAPY PREMISES

Offices also at: Sabena House, 36 Piccadilly, London, W1V 9PA
35 Birmingham Road, Sutton Coldfield, West Midlands B72 1QE

Telephone: 01-734 5371
Telephone: 021-355 3531

Plea to 'go easy' on ambulances

Worried health watchdogs have made a "goeasy" plea to outpatients who are using ambulances as free taxis into town for shopping expeditions.

They say the vehicles cost around £1.50 a mile to run and some crews are being used to take people on unnecessary journeys which could easily be made by public transport or car.

Their concern comes at a time when West Midland ambulance services are stretched to the limit because of a dire shortage of trained drivers.

A recruitment campaign has failed to find enough replacements.

In South East Staffordshire the community health council is so concerned at the strains being imposed on the crews that it is asking the public to use ambulances only when essential.

In a report, the CHC suggests they should only be used by outpatients when "prescribed" by a doctor or hospital staff.

"The ambulance service is not a substitute for expensive or inadequate bus services. Nor should it

be regarded as a one-way taxi service — to the outpatients' clinic by ambulance, shopping in town and a return home by bus.

"It's current cost of about £1.50p a mile is too expensive to abuse and might well mean denial of service to those who genuinely need it."

At Burtwood, near Lichfield, families are continuing a campaign for a local ambulance station.

FIG. 26

NEWSPAPER REPORT OF RISING AMBULANCE COSTS

TABLE 33 : COST COMPARISON OF DOMICILIARY AND HOSPITAL PHYSIOTHERAPY
(1.9.78 - 31.3.79)

ACTIVITY COSTS	DOMICILIARY TREATMENT	TOTAL COST	HOSPITAL TREATMENT	TOTAL COST
Treatment Time	736.75	1937.65	125.5 hours	330.06
Waiting Time			16.6 hours	43.65
Travelling Time	5553.5 miles 283 hours	663.65 744.29	Ambul. miles 804 @ £1.20/mile	964.80
Disposables	Pro rata	44.40	Disposables	4.88
Uniform	Pro rata	31.54	Uniform	3.46
Telephone	Calls Time	9.84 64.70	Calls Time	1.08 7.10
Postage	Stamps Time	19.46 85.32	Stamps Time	2.14 9.36
Clerical	Time	95.96	Time	10.53
Stationery	Envelopes Letterheads	1.51	Envelopes Letterheads	0.17
Supervision/ Administration	125 hours	430.30	25 hours	95.50
Opportunity Costs	1.5 Rx/ day	690.63		
Buildings	Nil		9869 sq ft @ £1 sq ft pro rata	23.02
Research Costs	Pro rata	208.56	Pro Rata	22.88
Visits	30 hours	71.10	"	7.80
Teaching	14 hours	33.18	"	3.64
Equipment	UPPB + U/Son.	402.18	"	100.00
Portering			Time	57.01
Report Writing	Pro rata	597.24	Pro rata	65.52
Meetings	113.5 hours	286.77	7.5 hours	19.72
Refreshments			10p/R _x	12.00
Holidays	Pro rata	597.24	Pro rata	65.52
TOTAL		6532.04		1796.80
Cost per Treatment		5.97	Less Ambulance	14.97 6.93

The total cost for the domiciliary treatment was averaged as £5.97 per treatment and the ambulance treatment cost was averaged as £6.93 per treatment with an additional £8.04 if an ambulance journey was required. These figures correspond with the results of various studies carried out in other parts of the country, Compton (1979)(c).

Sample 3

During the period when the sample of orthopaedic patients was being collected, the domiciliary physiotherapy service continued and details of a third sample of 200 patients were available which could be used as a comparison against the previous two samples of similar size. No attempt was made with this third sample to measure costs or benefits and the tables overleaf list the make-up of the sample, the main presenting diagnosis, the treatments used and the outcome of treatment.

Age and Sex, Sample 3

The proportion of men and women was similar although there were more patients in the under 65 age group. This was due to the increased number of referrals of the young handicapped patient, including MS sufferers, polio and paraplegia patients. Harrison (1980) reports that up to the present there has been little coherent thinking with regard to the problems of the young handicapped in the community. It is apparent that the domiciliary physiotherapist is thought capable of dealing with some of these problems.

TABLE 34 : Age and Sex of Patients in Sample (3).

	0-64	65-69	70-74	75-79	80-84	85-90	90	TOTAL
MEN	17	14	12	9	13	1	.	66
WOMEN	24	17	22	31	27	8	5	134
TOTAL	41	31	34	40	40	9	5	200
%	20.5	15.5	17	20	20	4.5	2.5	100

TABLE 35 : Main Diagnosis by Age Group (Sample 3)

	0-64	65-69	70-74	75-79	80-84	85-89	90+	TOTAL	%
O.A.	2	2	5	12	12	1	2	36	18
C.V.A.	16	12	9	15	12	1	1	66	33
R.A.	1	3	2	1	1	1		9	4.5
Other Disease	2	3	4	4	5	3	1	22	11
Other Orthopaedic	2			3	2			7	3.5
Fractured Femur		1			2	1		4	2
Parkinsons			2					2	1
Hip Operation		1	1	1				3	1.5
L.B.P.	2		1		2	1	1	7	3.5
Other C.N.S.	2	3	1					8	4
Other Fractures	4		1	2	1			8	4
D.S.	4	3	1					8	4
C. Spind.			1	2	3			6	3
Circulatory	1					1		2	1
Bronchitis	1	2						3	1.5
Other Resp.	1	1	4					6	3
Amputee	1		2					3	1.5
	41	31	34	40	40	9	5	200	100

TABLE 36: Treatment Procedures (Sample 3)

Treatment	MEN	WOMEN	TOTAL	%
Assessment and Advice	65	133	198	99
Exercises	62	124	186	93
Ultrasonics	1	.23	24	12
Massage		3	3	1.5
Heat	1	11	12	6
Interferential		3	3	1.5
Faradic		1	1	0.5
Ice	1	1	2	1
Traction		1	1	0.5
Postural Drainage	5	3	8	4
No Treatment		2	2	1

TABLE 37: Outcome of Treatment, By Age (Sample 3)

AGE	MUCH BETTER	SLIGHTLY BETTER	NO CHANGE	WORSE	HOSPITAL ADMISSION	TRANSFER G.D.H.	TRANSFER O.P.D.	DIED
0 - 64	9	13	13		4	1	1	
65 - 69	4	8	8		3	3	1	4
70 - 74	4	13	10		3	3	.	1
75 - 79	14	12	6		3	2	1	2
80 - 84	8	17	6		3	2	2	1
85 - 90	1	4	3			1	1	
90+	1	2	1			1		
TOTAL	41	69	47		16	13	6	8

Main Diagnosis

In common with the two preceding samples, stroke patients predominated with 33% of the referrals. Osteo-arthritis was the second most frequent referral with 18% but there was an increase in orthopaedic referrals to 17.5, if all such conditions were included. Other diseases were the last major figure, with 11% of the referrals.

Treatment Procedures

There was little difference between the samples with regard to the treatment procedures used, with assessment and advice leading followed by exercises being given to the majority of patients in the sample. Ultrasonics again proved the most popular of the physical treatment modalities, possibly because of the convenience of application and because that the treatment is often successful.

Outcome of Treatment

A similar picture emerged from the sample with regard to the success of treatment with 55% of the patients treated recorded as improved.

At this stage of the study considerable information has been obtained with regard to the age and sex of patients referred, the types of conditions from which they were suffering, the types and frequency of treatments given as well as detailed information about the costs involved in the supply of domiciliary treatment. The next stage of the study was devoted to an examination of the possible benefits of such a service, which involved a number of subsidiary studies, described in Chapter V.

DOMICILIARY PHYSIOTHERAPY

Cost and Benefit

Chapter IV

Benefits of a Domiciliary Service

Benefits of a Domiciliary Physiotherapy Service

At this stage of the study the benefits were listed without any attempt at pricing as it was hoped to be able to assign monetary values at a later stage. The likely benefits are listed in the table overleaf, and are shown as 'outcomes'. Some of these benefits could be described as 'soft benefits' and in such cases only estimated values could be given.

There are cash benefits, notably a saving on the ambulance service, earlier discharge from hospital and the prevention of hospital admission which, given the resources of a wider study, could be estimated. This first sample was used to identify the costs of the domiciliary service and in consequence the benefits are merely listed. As this was a new service the benefit to the elderly patient may have been outweighed by the additional cost of setting it up although this cost in turn may have been offset by the benefit of maintaining the patient in his home rather than admitting him to hospital.

Null Hypothesis

This hypothesis derives from the hypothesis listed on page 25 and 26 postulates that:

1. Hospital physiotherapy treatment would be cheaper to deliver and would produce greater benefit for the patient.
2. There would be no difference between treated patients and patients in the 'no treatment' groups.

It is possible to reject this hypothesis on both counts. Domiciliary physiotherapy achieved comparable results with a third fewer treatments and 86% of patients who completed treatment improved against 20% of the patients in the 'no treatment' group.

TABLE 38

COMMUNITY PHYSIOTHERAPY

(Study, August 1977-1978)

PARTY	OUTCOMES	QUANTIFICATION/EFFECTIVENESS MEASURE
South Birmingham Health District	Saving on capital development	Department need not be expanded to meet expected rise in demand from elderly
	Less congestion in hospital grounds	Up to 36 ambulances / day to physiotherapy department
	Portering time saving	Porter required to transport patients to and from ambulances
	Fewer hospital admissions.	Can be identified; during hospital engineers work-to-rule
	Earlier discharges	Can be identified
	Favourable publicity	See text
	Privacy of treatment area.	
	Comfort	
	Self respect	
	Involvement of Relative	Difficult in hospital department
Patient	No ambulance wait	Range of wait extends up to 4 hours (28.10.77). Mean waiting time 41.5 minutes
	No ambulance journey	Many patients unable to tolerate ambulance journey (see text). Mean time 72.67 minutes.
	No fares	Only 44% of sample has bus pass
	Earlier treatment	Treatment can commence almost immediately. Wait of up to 5 months in Physiotherapy Department.
	Saving G.P. time	Less frequent visits to patient (see text)
Community	Saving District Nurse	Advice available
	Saving Consultant	Less frequent GP referral of evening clinic, reduction of 50%
	Service to previously deprived group	New service
	Reduction of demand on ambulance service	197 return journeys, 1900 miles at total cost of £2,280.00.
	Maximum use of resource	Treatment more efficient (see text), equipment can be shared.
D.H.S.S.	Improved level of service	Service did not previously exist within the National Health Service except on very limited scale.

In the past the D.H.S.S. has affirmed that a domiciliary physiotherapy service would be uneconomic although there is no evidence to support this contention. There is adequate evidence from this sample alone to suggest that it is totally uneconomic to bring elderly patients to hospital in an ambulance for physiotherapy treatment. There are a number of reasons why domiciliary physiotherapy treatment is more effective for the elderly patient. The treatment is more relevant for both the patient and the physiotherapist. The help of the relatives can be obtained, the treatment can usually begin sooner, the domiciliary physiotherapy staff are enthusiastic and highly motivated and can act as co-ordinators for several agencies. To what degree and in what proportion these factors contribute to the degree of recovery in a patient is a matter for conjecture and this is in an area of research which might merit future attention.

Problems with the Ambulance Service

There are a number of problems associated with the use of an ambulance to ferry a patient to and from hospital. One important factor is whether the patient is considered sufficiently fit to withstand the strains imposed by an ambulance journey to the hospital physiotherapy department. Experience has shown that many old people, particularly those living alone, enjoy a trip out. Any pleasure derived from travelling to hospital and back might be decreased by the four hours or more that an average visit to the hospital will entail. There have been sufficient examples within the sample studied of elderly patients coming for a morning appointment and not returning home until 10.00 o'clock at night, to suggest that in spite of any possible pleasure derived from the trip out, the practice of

transporting elderly patients to hospital is less than satisfactory.

Table 39, page 185, shows the average waiting and travelling time involved in an ambulance journey to the hospital for physiotherapy treatment. Copies of the record sheets used to list these times for the ambulance patients and those for the domiciliary patients are contained in the Appendix 1. The average times shown are based on 197 ambulance journeys and on 1408 domiciliary visits. The total distance travelled by all of the ambulance patients was 1900 miles giving an average journey of 9.6 miles return for each ambulance patient treatment.

The average distance travelled by the domiciliary physiotherapist was 5.2 miles, each physiotherapist being based in the zone which allows them, most efficiently, to plan their daily itinerary which could begin at home and end in the hospital. In the case of the ambulance service, with the base at Bristol Road in Selly Oak, the journey is from there to the home of the patient, then to hospital and perhaps back to base. They can also be interrupted by emergency calls which are radioed and are unscheduled. This last factor in particular contributes to the overall unreliability of the ambulance service as a means of transporting the elderly to hospital.

During the study 18% of the planned journeys were cancelled without prior warning. The effect of such a cancellation is keenly felt by the patient and his relative who may have spent several hours preparing for the visit to hospital. Many instances have been recorded of elderly patients rising at five in the morning and sitting fully dressed, afraid to go to the lavatory in case they miss their ambulance. When they are the subject of cancellation their distress is evidenced by the telephone calls to the physiotherapy department.

They also endure anxiety on the evening prior to their subsequent appointment, as they worry about getting ready and they worry whether the ambulance is going to arrive or not. Providing the patient can make his own way to the physiotherapy department this should be the method of choice. If the treatment involves an ambulance journey it is hard to justify on any grounds.

TABLE 39 : Comparison of travel times, treatment times and waiting times. Domiciliary and Ambulance Patients. (Mean Values.)

	DOMICILIARY PATIENT	AMBULANCE PATIENT
TOTAL TRAVEL TIME	14.45 minutes (Physiotherapist)	72.67 minutes
TOTAL WAITING TIME	Varies: 30 - 60 minutes at home	41.5 minutes (in hospital)
TOTAL DISTANCE	5.22 miles (Physiotherapist)	9.6 miles (Mean of 1900 miles)
TOTAL TREATMENT TIME	42.7 minutes	51.79 minutes

Mean values based on 197 ambulance journeys and 1,408 domiciliary visits. (Aug 1977 - Aug 1978)

Benefits of a Domiciliary Physiotherapy Service

The benefits of a domiciliary physiotherapy service were identified during the study of the first sample of 200 patients as shown on page 181. While it was possible to list these benefits it was not possible to evaluate them in any objective sense. A more detailed examination of the benefits of a domiciliary physiotherapy service was undertaken with subsequent samples and the problem of outcome evaluation became the main focus of the study. Benefits are identified in the table, overleaf, and are described under separate headings below.

Saving on Capital Development

The projected rise in the very old is likely to throw increasing strain on the National Health Service. The domiciliary physiotherapy service is one way of providing treatment and support to this age group without the need for expensive building schemes and their consequential costs.

Many geriatric day-hospitals are seriously underused, largely because they rely on ambulance transport to bring the patient to them. Most day-hospitals are currently running at about 50% efficiency and expensive staff are sitting, underemployed in expensive and over-heated buildings. There has been no study of the cost effectiveness of the day-hospital and it is possible that much of their work can be carried out on a domiciliary basis. The rehabilitation element which accounts for a considerable proportion of the work with about 80% of the patients receiving physiotherapy treatment, Clark (1980), could be given by the domiciliary physiotherapist.

Domiciliary Service

TABLE 40
COMMUNITY PHYSIOTHERAPY

Study 1.9.78 - 31.3.79

PARTY	OUTCOMES	QUANTIFICATION - EFFECTIVENESS MEASURE
South Birmingham Health District	Saving on capital development	Present accommodation can cope with projected rise in elderly population.
	Reduced congestion	Reduction by 14% of daily ambulance journeys to department.
	Portering time saving	Reduction by above percentage.
	Fewer hospital admissions	Estimated as 5% of total referrals.
	Earlier discharge	Estimated as 10.5%.
	Favourable publicity	(see text)
	Privacy of treatment	(see text)
	Comfort	(see text)
	Involvement of relatives	(see text)
	No waiting	Waiting can extend up to 2½ hours
Patient	No ambulance journey	Mean travelling time saved 56.24 minutes.
	No fares	Only 24% of sample had bus pass.
	Earlier treatment	Can commence immediately. Current waiting list in OPD 972 patients.
	Saving medical time	(see text)
Community	Saving nursing time	(see text)
	New service	(see text)
	Reduced demand ambulances	120 journeys, 804 miles at cost of £964.80
D.H.S.S.	Maximum use of resources	(see text)
	Improved service to elderly	(see text)

Reduced Congestion

This refers to the reduction in ambulance transport to the physiotherapy department. There has been a reduction of 14% in the number of ambulance patients being transported to the physiotherapy department which, in terms of numbers of patients, is about nine hundred patients fewer during the course of the study period.

Fewer Hospital Admissions

It is estimated that about 5% of the sample would have required hospital admission but for the attention of the domiciliary physiotherapist. Evidence for this was based on doctors comment, together with the experience of the various industrial disputes during the course of the study, when patients could not be admitted to hospital and, instead, were treated in their own homes. The letter from a GP, overleaf, demonstrates one doctor's perception of the domiciliary physiotherapy service.

There has also been an overall reduction in the number of beds in the geriatric wards of ninety beds, Harrison (1980), as well as an increase in turnover of about two and a half times. While it cannot be claimed that this is entirely due to the availability of a domiciliary physiotherapy service, it is possible that the service has played a part.

Early Discharge from Hospital

Certain consultants are able to discharge their patients from hospital at an earlier date than had been possible before the existence of a domiciliary physiotherapy service, notably the orthopaedic surgeon and the consultant geriatrician.

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2.7.7.78

Physiotherapy Dept.
S.O.H.

Dear Mrs. Robinson

Thank you very much for your letter regarding Mrs. Smith and I am enclosing the assessment chart.

You did a marvellous job. Mrs. Smith has lost her shoulder + neck troubles and is now walking and able to leave her home. What more following your visits she is mentally more alert + enjoying life.

Thank you very much for your help

Yours sincerely
A. Klein

This letter illustrates the opinion of the doctor, with regard to the value of the physiotherapy treatment.

(Reproduced with permission.)

Favourable Publicity

There has been considerable interest in the present service and there have been visitors from all over the country as well as from overseas. The service was described to the Congress of the Chartered Society of Physiotherapy at the University of Birmingham Frazer (1979)(h) and many lectures have been delivered describing the service to various professional groups.

One measure of the value of such publicity is the fact that during the course of the current study, no recruitment advertising has been necessary, in spite of the fact that over thirty staff have left and been replaced at Selly Oak Hospital. The cost of a single advertisement is over £100.00 and it is likely that the publicity attracted by the domiciliary physiotherapy service has produced a secondary benefit for the South Birmingham Health District.

BENEFITS TO THE PATIENT

It is probable that around 80% of the patients treated in the domiciliary sample would not have been able to receive physiotherapy treatment unless an ambulance had been available to bring them to hospital.

Many of these patients would have been too unwell to withstand the rigours associated with the ambulance journey, as described in the text.

The availability of the domiciliary physiotherapy service is therefore a major benefit to the patient who is thought by his doctor to require this treatment. Involvement of the relative, mentioned earlier, is particularly important as it ensures continuity of treatment, boosts the morale of both parties and provides a

source of help to the National Health Service.

There are times when relatives, because of fear, are reluctant to have a patient discharged home from hospital. Sometimes this reluctance is compounded by anxiety at the thought of having to cope with the hard work that the presence in the home of a sick person can cause. The availability of the domiciliary physiotherapy service can help these people or can, in the first instance, help the doctor to persuade the relatives to keep the patient at home. It has been found that relatives are happier if a reliable source of information, about the handling of the patient's illness, is available. The physiotherapist has shown herself to be a suitable person to perform this task.

There is also a marked reduction in waiting time before physiotherapy treatment can begin as many patients are seen on the day of referral. This is particularly important in the case of the elderly patient as a long wait for treatment will inevitably entail increasing immobility with the probability of hospital admission.

Benefits to the Community

Saving of medical and nursing time has been reported although the quantification of such savings has been outside the scope of the current study. A patient who is receiving physiotherapy treatment is less likely to make demands on his doctor and this has been confirmed by a number of general practitioners. There have been three instances during the course of the present study when a patient called out the domiciliary physiotherapist because they could not contact their doctors.

One patient had suffered a stroke and on arrival at the house after midnight, the physiotherapist attempted to contact a locum

medical service and was unsuccessful. She then called out an emergency ambulance and the patient was admitted to hospital. A second patient called out the physiotherapist at three o'clock in the morning because he was afraid to bother his doctor! An abscess in his knee had burst and the physiotherapist spent the rest of the night with the patient, treating his knee, and called out the GP in the morning. The third patient was suffering from acute anxiety and simply required reassurance.

There have been instances during the study when the district nurse was withdrawn once the physiotherapist commenced treatment. It has also been observed by a consultant that the domiciliary physiotherapist can take over the role of the social worker, but the social worker cannot take on the role of the physiotherapist. It has been apparent during the course of the study that the domiciliary physiotherapist has greatly extended the role of physiotherapy, Frazer (1979)(i).

D.H.S.S. Benefits

The provision of health care to the elderly has often been the subject of criticism and the presence of a domiciliary physiotherapy service can do much to improve the services to the elderly patient. The increased number of young chronically sick patients being referred to the service is also evidence that this group of patients are being offered help which was, in the past, often not available.

The reduction in demand on the ambulance service is a major saving. If it had been possible to transport the domiciliary patients to the hospital for their physiotherapy treatment, the total cost of the 1094 domiciliary treatments carried out would have been £16,377 instead of £6,531 assuming that the patients

were fit to travel and that the ambulance service was able to cope. The provision of such a service has enabled a more complete use to be made of existing staff and equipment on a wider scale. There has been an opportunity for interdisciplinary education as well as an improvement in communication between the hospital service and the community. If the cost of the ambulance journey is computed for the two separate domiciliary samples the amount involved would be £42,706 which is more than the cost of the service provided.

Physiotherapy Staff Benefits

The challenge of the work in the community provides a stimulus and the work itself confers an enhanced status as a professional person whose opinion is sought and accepted by medical and other colleagues. The domiciliary physiotherapy staff are aware that they are providing a valuable service to the patient in the community and that they are often able to alleviate the problems of the handicapped patient. There is a high job satisfaction in the work, Frazer (1978)(d).

At this stage of the study it was clear that the physiotherapy service could provide effective treatment, to the elderly patient, at a comparable cost to the hospital based alternative. It was possible to identify the costs of such a service and it was considered desirable to be able to value the benefits in similar monetary terms. It was decided to utilize a cost benefit analysis approach in an attempt to achieve this evaluation.

Cost Benefit Analysis

If a decision needs to be made whether to provide a particular service, the cost-benefit approach requires that the service should

only be provided if the benefits exceed the cost, both costs and benefits being enumerated and measured in monetary terms. The measurements of costs was found to be relatively straightforward but, in the case of the elderly patient, measurement of benefit in financial terms is much more difficult.

Many of the results of treatment concerned an improvement in the quality of the patient's life or in his ability to cope with a disability rather than in any dramatic improvement in his physical condition. In many instances it was the relative who derived the greatest benefit from the intervention of the physiotherapist and it was difficult to identify a true unit of output for a physiotherapy treatment. There were difficulties in deciding what were appropriate indicators of output and what method of measurement could be used to include them in a cost benefit analysis.

Patients benefits vary greatly between individuals and in certain cases are difficult to identify. In general terms the value of health to an individual is the ability to lead a full life and it is possible to construct a scale, ranging from perfect health to death, along which can be indicated the state of health of any individual.

Perfect Health Death

FIG. 28

There are many difficulties in assessing the value of life, or even of difficult health states and this may explain why such analysis of health care has been eschewed by the practitioners of cost benefit analysis.

There are guidelines determining the value of life such as court awards, although these can range from as low as £90.00 in

Northern Ireland to the recent record sum (at the time of writing) of £262,500 to a patient who experienced brain damage during a simple operation. Arguments around the relative values of varying states of health and a number of approaches have been adopted for use during this study. These are the consumer sovereignty approach and the human capital approach.

Consumer Sovereignty

This approach was thought to be appropriate in the case of health care as a patient does not become a patient until he refers himself to the doctor either because he does not feel well or because he is incapacitated in some way. As this study utilized the patient's subjective report as one indicator of improvement, it was logical that a similar approach might be utilized to judge the value of treatment.

Consumer sovereignty is based on the contention that the individual who is affected by any project is considered to be the best judge of its value. In the case of domiciliary physiotherapy an attempt had to be made to determine what value each patient would place on the benefit he experienced as a result of his physiotherapy treatment.

A major problem with this approach is that a presumption must be made that the individual is capable of making the necessary judgements involved and is also able to decide what are the appropriate factors supporting these judgements. Decisions regarding the type of treatment are left to the specialist and it could be argued that because the recipient has little to say in how treatment is delivered he is, therefore, unable to determine its value. Health policy is ultimately decided by the appropriate government minister who, in turn, is elected by the consumer and the minister's judgements up to a point might reflect the wishes of the consumer.

With the exception of the mentally confused, the very young and

certain mentally ill patients, it is considered that most patients are capable of judging their own state of health, albeit in simple terms.

There are difficulties experienced by patients when they attempt to state, in monetary terms, what the value of their present state of health might be. Culyer (1971) suggested that 'state of health indicators' might be used with relative weights attached to pain restriction, remarking: "In practice these judgements would probably be made by medical people". A further difficulty is the 'halo effect', where the patient, because of the gratitude he might feel for the attention of the physiotherapist, might tend to overvalue the treatment.

In spite of the above difficulties it was considered that some reflection of the views of the consumers could be relevant to an overall evaluation of the domiciliary physiotherapy service. A scale to measure the patient's estimation of the value of his treatment was added to the measurements used in the study and is described in the next chapter.

Human Capital

Schultz (1971) suggests that people enhance their capabilities as producers and consumers by investing in themselves, while Becker (1962) considered that activities which influence future monetary and psychic incomes by increasing the resources in people are called investments in human capital.

Using such an approach it might be possible to place a monetary value on all of the benefits likely to be derived as a result of any particular decision. In the case of the domiciliary physiotherapy service, the effect of a simple exercise taught to a patient was twofold. One effect was easily costed while the other effect produced a psychological benefit, ie, the ability to reach out and

then use a urinal, reduced the soiling of bed-linen and clothing with an accompanying psychological boost to the morale of the patient. In this example there were both monetary and psychic benefits and in such cases it is expedient to record the latter as 'soft benefit'.

Inputs to human capital are mainly financed by the State, as in the case of the National Health Service. Money spent on health care could be said to reflect the attitude of the consumer who, if left to his own devices, might tend to spend too little rather than too much. The human capital approach values life in terms of the value of labour and utilises data concerning lifetime earnings, participation in the labour force and mortality rates, to give an estimation of earnings for any age group. Projected earnings are discounted to present value terms for the purposes of cost benefit analysis.

Using such an approach, Dawson (1976), estimated the value of life at £7,880. The retired individual using these estimates at that time had a human capital value of £0.00 and if the sole goal of society was to maximise the Gross National Product, help would be refused to the old and treatment would be denied to a non-producer. Subsequently, it was appreciated that even non-producers are also consumers and that society did benefit from their consumption and the human capital approach was extended to include the value to society of the consumption of each individual member.

Monetary Value of Treatment

In order to implement either of the methods described above a system of measurement was required which would allow a patient to place a monetary value on his physiotherapy treatment.

A scale similar to that used for the pain thermometer was devised which had values ranging from £0.50 to £10.00. When a patient completed a course of physiotherapy treatment he was asked to indicate a point on this scale which he thought would represent the probable cost of purchasing a single physiotherapy treatment. A selected number of the second sample were asked to complete this scale and a system was devised which is described in the succeeding chapter.

It will be noted that this scale asks the patient to assign a cost to the treatment, rather than to place a value on it. An inference may then be drawn regarding the value to the patient of any treatment. It is appreciated that this is a compromise as the value of any treatment will be different for different patients and at different times and it is thought improbable that a common denominator of value could be achieved other than by relating it to the cost of a treatment. This could not be tested, other than by asking the patient to pay for his treatment.

DOMICILIARY PHYSIOTHERAPY

Cost and Benefit

CHAPTER V

The Measurement of Benefit in Monetary Terms

INTRODUCTION

This chapter describes two studies carried out during 1980 which were designed to investigate the possibility that any benefit deriving from a physiotherapy treatment could be measured in economic terms. The costs involved in the provision of a physiotherapy service are readily identifiable and are expressed in money terms, it was therefore considered desirable to attempt to measure the outcomes on benefits from such a service in similar terms, eg money.

The first study was carried out on a sample of 400 patients and sought an answer to the question whether a patient would be able to estimate the value, to him, of a physiotherapy treatment. The second study was a cost/benefit study of the physiotherapy treatment of acute neck and back conditions as mentioned on page 2, Chapter I. This study utilised the experience gained in the study mentioned above and concentrated on patients who were under 65 years and who were, in the main, engaged in paid employment. These two studies are presented below and their relevance to the main study of domiciliary physiotherapy is discussed on pages 222 and 224.

Study 1

It is often difficult to assign a monetary value to a particular service and a number of methods have been used in attempts to put a cash price on certain medical treatments, Culyer (1971), Schultz (1971), Becker (1962), Dawson (1976), have all put forward various schemes which can be used for such a purpose. The consumer sovereignty approach has been adopted for the current study, described below, and this approach is based on the belief that the individual who is affected by a particular service is the best judge of its value. This report describes the results of this experiment carried out over a period of several months at Selly Oak Hospital on a sample of 400 patients.

Method

The experiment involved 8 physiotherapists who treated between them a total of 400 patients. The patients were drawn from the referrals made to the physiotherapy department from the following areas; 100 patients from the surgical wards, 50 patients from the obstetric/gynaecology wards, 50 from the orthopaedic wards, 150 from the out-patient department and 50 gymnasium patients (Table 43).

All of the questionnaires used in the study were applied by one clerical volunteer who visited the patient following his treatment and asked him to co-operate in the study. The patient was also told that his remarks would be confidential and would not be communicated to the physiotherapist.

Measurements

A list of the measurements used is contained in the appendix and consists of a block of five question sheets. These sheets are designed to evaluate the physiotherapist, the physiotherapy treatment and to assign a price to the physiotherapy treatment.

Therapist Rating Scale

This rating scale is a semantic differential scale and is based on scales devised by Osgood (1957) and others.

The person doing the rating describes the physiotherapist and the treatment by choosing a point on the response continuum containing two opposite descriptive terms, one on each end of the scale. This scale can be used equally well to rate the person and treatment.

The composite result emerging from this scale is specific, detailed and descriptive. In order to prevent the tendency to

respond in a wholly favourable manner, the desirable and undesirable traits are mixed in the scale. There is also a tendency among patients to the adoption of a halo effect regarding the therapist, that is to view them favourably and this is made more difficult by the construction of the scale.

The scale chosen was designed to reflect a range of qualities thought desirable in a physiotherapist and the scale is scored from one to seven points, the 'one' being closest to the negative or undesirable end of the scale, the 'seven' being the score for the most desirable of the scale. Patients are asked to circle a dash at the point which they feel most accurately reflects their opinion at the time.

Treatment Rating Scale

This scale is designed on the same lines as the therapist rating scale and is scored in the same manner.

Treatment Value

This scale is based on the Likert scale (1932) and is completed by the patient who circles a statement which most closely corresponds with his opinion regarding the statement contained.

The choice of monetary values was based on the actual average cost of a physiotherapy treatment at Selly Oak Hospital which was determined by adding together the total annual cost of salaries and related expenses, the total non salary expenses and the estimated rental value of the physiotherapy department plus the total non discounted value of the equipment within the department. This sum was then divided by the total number of treatments carried out

annually to give a figure of £1.62 as the average cost of a hospital physiotherapy treatment. The three scales were ranged from £1.50 to £2.00 with £1.75 as the intermediate value.

These scales were presented to the patient along with the two described above immediately upon completion of the physiotherapy treatment. As with the others, the scales were presented by clerical staff who had no connection with the treatment.

Eysenck Personality Inventory

Each physiotherapist participating in the study completed the Eysenck Personality Inventory. This measurement was made to assess the personality of the therapist and to ascertain whether the rating by the patient would be influenced by this variable.

In this inventory, Eysenck(1969) , describes personality using three dimensions, of these the extroversion/introversion and the neuroticism/stability are scaled respectively E and N. Eysenck has produced a series of population norms for these scales; E being 12.07 and N being 9.07. People with scores above these mean scores can be described as either extrovert or neurotic. Extroverts are thought of as people-orientated, with a preference for action rather than for reflection, outgoing, uninhibited and optimistic. Neurotics are thought of as the opposite with a tendency towards anxiety, worry and showing a tendency towards obsessiveness. Unless these scores are at the extreme end of the scales there is nothing abnormal, as most individuals possess many of the above characteristics in varying degrees.

TABLE 41: Age, Sex and EPI Scores (Physios)

	AGE	SEX	E-SCORE	N-SCORE
Physio A	51	F	12	5
Physio B	31	F	10	12
Physio C	21	F	9	12
Physio D	41	F	17	8
Physio E	33	F	5	5
Physio F	22	F	11	19
Physio G	21	F	15	14
Physio H	53	M	6	1

Discussion

As can be seen from Table 41, the scores of the physiotherapists participating in this experiment show a considerable variation in personality types. It has been claimed that physiotherapists can be described as neurotic extroverts, Child (1974), who found that the mean scores for physiotherapy students was E 13.63 and N 11.66. Only one of the physiotherapists taking part had scores which came within this range and it might be argued that those involved are not typical. This argument might be discounted as the sample used by Child was relatively small and moreover it has not been shown that any significant correlation between the personality of the physiotherapists and the patients valuation of the treatment exists.

A sample selected at random from third year physiotherapy students showed that their mean scores were respectively, 14.4 E, 11.8 N, whereas the mean scores of the physiotherapists taking part in this experiment were, respectively, 10.625 E and 9.5 N. No significant relationship was found to exist between the therapist rating and evaluation, nor between the treatment rating and valuation, Table 43. The only relationship which was statistically significant, $P < .05$, was the number of patients who described the therapist to be 'very like themselves' and listed the treatment valued at £2 as very good value, Table 42.

The aim of this experiment was to discover whether individuals would be able to assign a monetary value to, what is to them, a free service. The restriction of the range of possible values offered, £1.50 - £2.00, created an artificial limit to the possible valuations. Some patients went outside this limit, mainly on the lower value with 17 patients valuing their treatment at less than £1.50.

Table 42: Patient's Estimation of Treatment Value.

	Rx £2.00	Rx £1.75	Rx £1.50	Rx £1.50	Total Value	Mean Value	% Above Cost
Physio A	48	-	2	-	£99.00	£1.98	22%
Physio B	34	5	6	5	£90.75	£1.81	12%
Physio C	42	3	1	4	£94.75	£1.89	17%
Physio D	43	3	3	1	£96.75	£1.93	19%
Physio E	45	2	2	1	£97.50	£1.95	20%
Physio F	46	2	2	-	£98.50	£1.97	21%
Physio G	47	2	1	-	£99.00	£1.98	22%
Physio H	35	7	2	6	£91.25	£1.82	12%

An earlier study had shown that, given a free range of values, patients would value their treatment on a scale between £1.50 and £10.00 per attendance. It should also be noted that most patients attending the out-patient department are required to pay their own transport costs which can often exceed £1.50 per visit.

As can be seen, Table 42, all of the physiotherapists attracted a mean value which is higher than the £1.62, which is the actual cost per treatment as described earlier. It is interesting to note that the out-patient physiotherapists were valued lower than the ward physiotherapists. It may be that the patient on the wards feels a sense of obligation towards the staff working there, or the ward may engender feelings of gratitude associated with a relief at surviving an operation.

In the case of the out-patient treatment it was noted that patients receiving more than one treatment procedure on each attendance tended to value their treatment much lower, often at less than £1.50, ie, below cost. This may be associated with the question asked by many patients, "Am I going to have to pay for my treatment now?"

Conclusion

This short pilot study has shown that patients are prepared to assign a monetary cost to a free service. It would not be possible to test the validity of the findings, irrespective of the value to them of this service, other than by charging the samples mean valuation of £1.91 for treatment to determine how many patients would be prepared to pay. It is worth noting that the patients valuation of their physiotherapy treatment is just over 18% above the cost of providing it.

It was recognised at this stage that the measurement scales used in this section would reflect the opinion of the patient with regard to his estimation of the likely cost of providing a physiotherapy treatment. It was also recognised that the scales used were based on accepted measurement techniques but had not themselves been subjected to any validation method such as a re-test experiment. It was therefore not possible to use a parametric test to validate the relationships between the various elements listed in the measurements. It was also appreciated that any values arrived at might only reflect a central tendency error. In spite of the inherent statistical limitations due to the measurements used which do not differentiate between the various areas where treatment was provided, it was thought that this type of measurement of value could be refined.

It had been thought that a patient would be able to assign a cost to a treatment which might reflect its value to him. The real value can be no more than an estimate as any identical treatment will have a different value for each patient who receives it.

TABLE 43: Physio Rating Related To Mean Value.

	Mean Treatment Value	Personality Score / 7	Treatment Score / 7	Place of Work
Physio A	1.98	6.79	6.78	Maternity
Physio B	1.81	6.70	6.52	O.P.D.
Physio C	1.89	6.89	6.82	Surgical Wards
Physio D	1.93	6.88	6.84	Orthopaedic Wards
Physio E	1.95	6.89	6.87	Surgical Wards
Physio F	1.97	6.84	6.84	Gymnasium
Physio G	1.98	6.92	6.81	O.P.D.
Physio H	1.82	6.67	6.65	O.P.D.

Study 2

47 patients referred by G.P.'s to the consultant orthopaedic out-patient clinic and diagnosed as suffering from either an acute neck or back condition, were randomly referred to one of three groups. Group 1 had physiotherapy treatment at home, Group 2 had physiotherapy treatment in the hospital physiotherapy department, and Group 3 had no physiotherapy treatment.

90% of the patients in Group 1, and 78% of patients in Group 2, achieved full functional recovery and returned to work, whereas only 14% of those in Group 3 showed any improvement following treatment with analgesics and bedrest. These remaining patients were then referred for either physiotherapy treatment at home or in the hospital and 78% were discharged as fully recovered following a three week course of physiotherapy treatment.

Introduction

Comparatively little work has been undertaken with regard to the cost-effectiveness assessment of physiotherapy treatment. Results from a three-year study of a domiciliary physiotherapy service to the elderly in the South Birmingham Health District, Frazer (1979)(j) demonstrated that such a service is both effective and economic for this particular age group. It had, however, proved difficult to quantify the benefits of such a service and the current study was initiated.

The factors measured within this study include length of time off work prior to treatment, effect of treatment and whether the patient returned to work following treatment.

The aim of this study was threefold:

1. To determine whether physiotherapy treatment was effective for

- the type of patient referred;
2. to compare the results of hospital and home-based delivery of physiotherapy treatment;
 3. to provide a quantitative measure of treatment outcome.

Method

All patients in the study were initially referred by their GP to the consultant orthopaedic out-patients clinic. They were suffering from an acute neck or back condition or an acute exacerbation of a chronic condition. On arrival at the clinic the patient was assigned to one of three groups as shown in the diagram below:

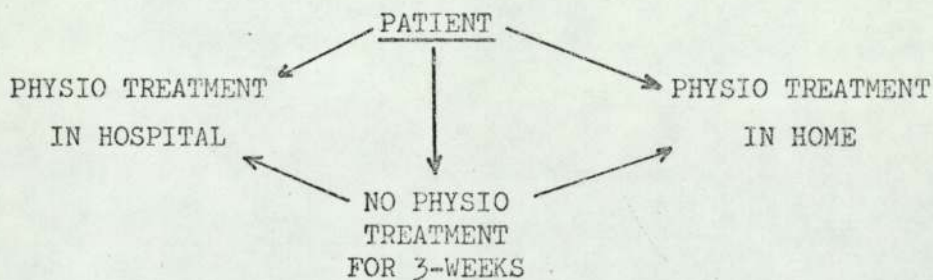


FIG. 29 STUDY DESIGN : ORTHOPAEDIC SAMPLE

The patient was then seen and assessed by the Consultant Orthopaedic Surgeon and given the appropriate referral (depending upon the randomization. A patient who was not referred for physiotherapy treatment would be advised to rest for a period of three weeks, in bed if necessary, and prescribed the appropriate drugs. The patients referred for physiotherapy treatment were given the physiotherapy treatment as shown in Table 46 in the case of domiciliary patients, and Table 49 in the case of patients treated in the physiotherapy department.

On completion of a course of physiotherapy treatment the patient returned to the orthopaedic out-patients department for assessment

TABLE 4⁴ : Patients Having Three Weeks Wait: Outcome Following Physiotherapy Treatment.

AGE	SEX	CONDITION	OUTCOME	FOLLOW-UP	TREATMENT	NO RX	OUTCOME	RETURN TO WORK
55	M	LBP (L) Sciatica	No better	Hospital physio	Traction, manipulation, microwave.	12	Slight Improvmt	Yes
40	F	Acute LBP	No better	Hospital physio	Examination, infra-red, Maitlands.	1	Did not return	?
27	F	Cervical N. irritation Old treatment	No better	Hospital physio	Manipulation and interferential	2	Better	Yes
34	M	LBP (R) Sciatica	No better	Hospital physio	Traction and interferential	11	Better	Yes
45	M	C Spond. / N. root pain	No better	Hospital physio	Manipulation	3	Better	Yes
18	F	Acute LBP	No better	Hospital admiss	Laminectomy	-	-	-
58	F	Acute LBP with Sciatica	Did not return	Discharged	-	-	-	-
42	M	Acute C. Spine (L) N.Root pain	Did not return	Discharged	-	-	-	-
20	F	Acute LBP	Better	Discharged	-	-	-	Yes
66	M	(L) 4/5 Disc lesion	Better	Discharged	-	-	-	Yes
36	F	LBP (R) Sciatica	No better	Domiciliary physio	Ultrasound, manipulation advice and exercises.	12	Better	U/E
49	M	(L) Sciatica LBP/Accident	No better	Domiciliary physio	Ultrasound, manipulation	10	Better	Yes
32	M	(R) Sciatica LBP	No better	Domiciliary physio	Ultrasound, manipulation advice and exercises	4	Better	Yes
30	M	LBP	No better	Domiciliary physio	Ultrasound, manipulation advice and exercises.	6	Better	Yes

TABLE 45: Patients Having Three-Week Wait Before Treatment.

AGE	SEX	CONDITION	TREATMENT	OUTCOME	FOLLOW UP	WORK
55	M	Severe LBP with Sciatica	Bed-rest	No better	Refer for hospital physio	Off
40	F	Acute LBP	Bed-rest	No better	Refer for hospital physio	Off
27	F	CN root irritation/old##	Collar	No better	Refer for hospital physio	Off
34	M	LBP (R) Sciatica	Bed-rest	No better	Refer for hospital physio	Off
45	M	C Spond (R) Root pain	Injection + C Collar	No better	Refer for hospital physio	At Work
18	F	Acute LBP	Bed-rest	No better	Laminectomy	Off
58	F	Acute LBP with Sciatica	Bed-rest	Did not return	Discharged	?
42	M	Acute C Spine (L)	Collar	Did not return	Discharged	?
20	F	Acute LBP	Bed-rest	Better	Discharged	At Work
66	M	(L) 4/5 Disc	Bed-rest	Better	Discharged	At Work
36	F	LBP (R) Sciatica	Bed-rest	No better	Treatment at home	Unemployed
49	M	(L) LBP / Accident at work	Bed-rest	No better	Treatment at home	Off
32	M	LBP (R) Sciatica	Bed-rest Analgesics	No better	Treatment at home	Off
30	M	LBP	Bed-rest Analgesics	No better	Treatment at home	Off

by the same Consultant, who carried out the original assessment. A patient who had been waiting for three weeks was similarly assessed and, if necessary, was referred for physiotherapy treatment. The doctors assessment was recorded on the patient's record sheet, Appendix 1, page 267.

The main criterion in determining improvements was whether the patient returned to work following treatment. Secondary criteria included restoration of normal function and pain-free movement. There was no restriction on the type of treatment utilised during the study. All treatments were given by two Senior physiotherapists with experience of manipulation.

Results

There are three groups of results available; Table 45 shows the outcome for the patients in Group 3, who had been ordered the treatment shown, which included bed-rest, analgesics and, where appropriate, a cervical collar. At the same time of their initial assessment, three were still at work, eight were off work, the remainder were unemployed or were not recorded. Following the three weeks waiting period, two patients were better and were discharged, two did not return to clinic while ten were no better and were referred for physiotherapy treatment in one of the two treatment areas.

Table 44 shows the result of treatment for these ten patients, with seven better and returning to work, one sufficiently improved to return to work, one did not return and the remaining patient was admitted to hospital for a laminectomy.

Table 47 gives a comparison for the two treatment areas with

the group of patients enduring a three week wait for treatment. It can be seen that the groups of patients having physiotherapy treatment achieved a significantly more favourable outcome to those having bed-rest or analgesics, $P < .02$.

Tables 46 and 49 show the outcome of treatment for the domiciliary and hospital treatment groups respectively, with all of the domiciliary patients listed as better and all but five of the twenty-three hospital treated patients achieving a similar outcome to physiotherapy treatment. The average number of treatments given to the hospital treated patient was 2.8 while the average course of treatment for the domiciliary patient was 7.1 treatments. In both groups the patients who were listed as no better had a full course of twelve treatments.

Tables 48 and 50 show the costs and benefits for the two treatment groups, domiciliary and hospital respectively.

In the case of the domiciliary patient there was no travel cost involved. Five patients in this section were off work as a result of their condition for periods varying from 3-14 weeks. In some cases this involved the patient in considerable cost, one self-employed floor-layer claimed to be losing £250.00 per week over a period of three weeks. This patient returned to work the day following his second physiotherapy treatment. Two patients in this section would have required an ambulance to transport them to hospital for treatment and this would have entailed a cost of £1.50 per mile, to bring them by ambulance to hospital. The hospital treated section of the sample were required to pay their own transport costs to hospital and the sums involved are listed. In some cases the patient reported losing considerable sums of money as a result of their incapacity; lost wages in three cases being reported between

TABLE 46: Domiciliary Patients : Treatment Outcome.

AGE	SEX	CONDITION	TREATMENT	NO OF R _x	OUTCOME	FOLLOW-UP	WORK	VALUE
44	M	C. Spnd. 6/7 disc	Manipulation	1	Better	None	Yes	5
35	M	C.N. Root pain	Ultrasonics Manipulation	2	Better	None	Yes	10
45	F	Fall, pain (L) Sciatica	Ultrasound, manipulation, Exercises, advice.	12	Better	None	Yes	8
26	F	C.N. Root (R) Tennis elbow	Ultrasound, exercises and advice.	7	Better	None	Yes	10
59	F	L/S N Root.	Ultrasound, manipulation, Exercises, advice.	10	Better	L/Support	Retired	10
36	F	LBP (R) Sciatica	Ultrasound, manipulation exercises, advice.	12	Better	None	Not Employed	6
49	M	LBP (L) Sciatica accident at work	Ultrasound, manipulation	10	Better	None	Yes	10
32	M	LBP (R) Sciatica	Ultrasound, manipulation, exercises, advice.	4	Better	None	Yes	5
30	M	LBP	Ultrasound, manipulation, exercises, advice.	6	Better	L/Support	Yes	10
61	F	(L) Sciatica	Ultrasound, exercises, advice.	12	Better	None	Redundant	5

TABLE 47: Comparison of Hospital Treatment, Domiciliary Treatment and 3-Weeks Wait Without Treatment.

	HOSPITAL TREATMENT		DOMICILIARY TREATMENT		3 WEEKS WAIT
	No. Patients	Average No. of Treatments	No. Patients	Average No. of Treatments	
Return to Normal	18	2.8	9	7.1	2
No Improvement	4	4.5	-	-	12
Slight Improvement	1	12.0	1	12	-

TABLE 48: Domiciliary Patients : Treatment Costs and Benefits.

AGE	SEX	CONDITION	HOW LONG SUFFERED	HOW LONG OFF WORK	No. Of Rx	DRUGS, IF ANY	TOTAL COST OF TREATMENT	COST TO PATIENT	POSSIBLE BENEFIT
44	M	Cervical Spndylosis 6/7 Disc ?	6 months	Not Off	1	Paramol	(1) 4.77 (2) 3.18 (3) 3.60	Nil	Pain free
35	M	Cervical N Root pain	3 weeks	3 weeks	2	None	(1) 1.06 (2) 1.06 (3) 2.10	Nil	Pain free
45	F	Fall, (L) Sciatica	8 months	1 month	12	Diazepam Paracetamol	(1) 14.31 (2) 9.54 (3) 10.80	Nil	Pain free
26	F	Cervical N Root Pain (R) Elbow	2 weeks	Not Off	7	None	(1) 7.68 (2) 3.44 (3) 2.85	Nil	Pain free
59	F	L/Sacral N Root pain	7 weeks	Not Off	10	None	(1) 13.51 (2) 2.91, (3) 3.00	Nil	Pain free
36	F	LBP (R) Sciatica	2 years	Unemployed	12	None	(1) 16.69 (2) 9.27 (3) 10.80	Nil	Pain free
49	M	LBP (L) Sciatica Work accident	8 weeks	3 weeks	10	Valium Panadol	(1) 19.82 (2) 2.65 (3) 1.65	Nil	Pain free
32	M	LBP (R) Sciatica	14 weeks	14 weeks	4	Analgesics	(1) 4.24 (2) 3.18 (3) 3.60	Nil	Pain free
30	M	LBP	8 weeks	Not Off	6	None	(1) 4.77 (2) 3.18 (3) 3.60	Nil	Pain free
61	F	(L) Sciatica	12 weeks	3 weeks	12	None	(1) 19.61 (2) 9.54 (3) 27.00	Nil	Slight Discomfort

(1) Time Cost

(2) Travel Cost

(3) Petrol Cost

TABLE 49: Hospital Patients: Treatment Outcome.

AGE	SEX	CONDITION	TREATMENT	No. of Rx	OUTCOME	FOLLOW-UP	WORK	VALUE
14	M	Torticollis spasms (R) S/Mastoid	Manipulation	1	Restored to normal	None	Yes	5
14	F	Pain / Stiff neck	Manipulation	1	Restored to normal	None	Yes	5
49	F	LBP (L) Sciatica	Manipulation	1	Restored to normal	None	Yes	5
44	M	LBP with (L) Sciatica	Traction - 100 lbs Microwave and exercises	9	No better	Bed-rest, hospital for epidural	Off	5
40	F	Acute LBP	Examination and microwave	1	Crying/shaking	Did not return	?	0
40	F	(L) Sciatica	Manipulation, traction, microwave and interferential	7	No better	L/S support	Off	5
27	F	Cervical (N) root old treatment	Manipulation, interferential	2	Restored to normal	None	Yes	10
34	M	LBP (R) Sciatica	Traction, interferential	11	Restored to normal	None	Yes	6
54	M	C. Spond pain	Manipulation	5	Restored to normal	None	Yes	10
44	M	C.N.R. irritation	Manipulation	2	Restored to Normal	None	Yes	10
32	M	LBP with Sciatica	Manipulation	1	Did not return	?	?	0
30	F	C. Pain and (L) arm	Manipulation	1	Restored to normal	None	Yes	5
45	F	Severe (R) shoulder pain	Manipulation	3	Restored to normal	None	Yes	15
35	F	LBP with (L) Sciatica	Manipulation, interferential and exercises.	5	Restored to normal	None	Yes	10
25	M	LBP	Manipulation	1	Restored to normal	None	Yes	5
32	M	LBP	Manipulation	1	Restored to normal	None	Yes	8
45	M	C. Spond (R) Root pain	Manipulation	3	Restored to normal	None	Yes	10
18	F	Acute LBP	Manipulation, microwave	3	Restored to normal	None	Yes	5
55	F	LBP	Manipulation	1	Restored to normal	None	Yes	5
24	F	Acute neck pain	Manipulation, traction	4	Restored to normal	None	Yes	5
46	M	Acute torticollis with pain	Manipulation	1	Restored to normal	None	Yes	10
66	F	Severe LBP (L) Sciatica	Traction, microwave and manipulation	4	Restored to normal	None	Yes	2
55	M	Severe LBP (L) Sciatica	Traction, microwave and manipulation	12	Slightly improved	L/Support	Yes	4

TABLE 50: Hospital Patients: Treatment Costs and Benefits.

AGE	SEX	CONDITION	HOW LONG SUFFERED	HOW LONG OFF WORK	No. of Rx	DRUGS, IF ANY	TOTAL COST INC. TRAVEL	COST TO PATIENT	POSSIBLE BENEFIT
14	M	Torticollis spasm (R) S/Mastoid	2 days	Schoolboy	1	Aspirin	£ 1.06	£ 1.30	?
14	F	Pain /Stiff neck	3 months	Schoolgirl	1	None	.26	Nil	?
49	F	LBP (L) Sciatica	5 months	At work	1	None	.53	.44	Pain free
44	M	LBP with (L) Sciatica	6 months	Off work 3 wks	9	Aspirin	£18.02	£3.96	Nil
40	F	(L) Sciatica	5 months	10 weeks	7	None	.38	£5.88	Nil
40	F	Acute LBP	18 months	Off work	1	Fortral	£2.36	.50	Nil
27	F	Cervical N Root pain old treatment	6 months	H/Wife	2	None	£2.12	Nil	Pain free
34	M	LBP (R) Sciatica	5 months	4 months	11	Fortral Robaxil	£25.86	£4.84	Pain free
54	M	C-Spondylosis, pain	3 weeks	Light job	5	None	£ 6.36	£2.00 £150.00*	Pain free
44	M	Cervical N Root, irritation	6 months	Not off	2	None	£ 4.34	.68	Pain free
32	M	LBP with Sciatica	5 months	4 months	1	None	£ 3.18	.40	Did not Return
30	F	Cervical pain & pain (L) arm	4 days	4 days	1	Paracetamol	.53	.44	Pain free
45	F	Severe (R) Shoulder pain	3 weeks	3 weeks	3	Parazoldin	£ 6.09	£50.00*	Pain free
35	F	LBP with Sciatica	13 years	3 weeks	5	Paracetamol	£10.60	£ 3.50	Pain free
25	M	LBP	1 year	Not off	1	None	£ 1.32	£ 1.00	Pain free
32	M	LBP	2 weeks	3 days	1	Paracetamol	£ 1.27	£ 1.00	Pain free
45	M	C Spondylosis with N root pain	6 months	Not off	3	None	£ 7.20	£ 1.80	Pain free
18	F	Acute LBP	5 weeks	4 weeks	3	None	£ 5.56	£ 1.62	Pain free
55	F	LBP	2 weeks	2 weeks	1	Acupon	£ 2.12	.30	Pain free
24	F	Acute neck pain	12 weeks	8 weeks	4	None	£ 5.98	£ 2.80 £136.00*	Pain free
46	M	Acute torticollis & pain	1 week	1 week	1	Codeine	.21	£ 5.60 £120.00*	Pain free
66	F	Pain back of neck and C Spondylosis	18 months	1 week	4	Valium Naprosyn	£ 9.64	£ 4.80	Pain free
55	M	Severe LBP with (L) sciatica	8 weeks	Not off	12	None	£22.26	£ 2.40	Slight Improvement

* Loss of wages

Table 51: Comparison of Costs of Hospital and Domiciliary Treatment.

	Hospital Treatment	Domiciliary Treatment
Total Treatment Cost	137.27	106.46
Mean Treatment Cost	1.72 per treatment	1.40
Travel Total Cost	45.26	116.95
Travel Mean Cost (per treatment)	.56	1.54

£120.00 and £150.00 per week with one man losing £50.00 per week as he had been down-graded to a lighter job. The cost to the exchequer resulting from the loss of revenue in taxes and in the payment of sickness benefit must also be considered.

In both Tables 48 and 50 the total cost of treatment is shown in the third column from the right, and Table 51 gives a comparison of the hospital and domiciliary physiotherapy treatments. The average cost to the National Health Service for hospital based physiotherapy treatment is £1.72 per visit, and £2.94 for the domiciliary treatment, with over half of the latter cost made up by travel costs. The former figure is similar to that shown in a study of 400 patients, Frazer (1980)(k). The mean domiciliary treatment cost per treatment for physiotherapy time was slightly lower than that for the hospital based treatment.

Discussion

Although the numbers of patients studied are relatively small, the results obtained reflect the value to the community of early physiotherapy treatment for acute conditions. These results confirm an earlier study of over 2,000 patients, Frazer (1980)(k).

The benefits for patients with an acute condition, of early physiotherapy treatment, can be considerable as can be the benefits to the economy as a whole.

Taking an average for all of the patients studied of the amount of income tax lost through the incapacity to work, based on an average wage for a total of 98 weeks lost work, a sum of £1,300 is estimated. The money paid out in sickness benefit is estimated as around £3,000. One patient reported as being £15.00 per week better off by not working. The sum of over £4,000 can be shown to be

the cost of sickness in this small sample. When the cost of the physiotherapy treatment of £360.00 as shown in Table 51, is placed against the former, the financial gain of an immediate physiotherapy service can be appreciated.

This favourable financial comparison takes no account of the personal relief to a patient which accompanies the restoration of normal functional movement and the relief of pain.

In this sample the patients were asked to assign a monetary value to each treatment that they received, using the method described on pages 200 and 206. The average valuation of a physiotherapy treatment (Table 49, page 217) was £6.90 in the case of the hospital patient and £7.90 per treatment in the case of the domiciliary patient, Table 46). The actual average cost of providing the physiotherapy treatment was £1.72 per treatment in the case of the hospital based treatment and £2.93 per treatment in the case of the domiciliary patient. The average total treatment cost for the hospital patient was £5.96 and for the domiciliary patient was £22.34.

It is immediately apparent from these figures that hospital based physiotherapy treatment is the more economic way of providing a physiotherapy treatment. These figures, however, do not take into account the fact that two members of the sample of patients treated at home would have required an ambulance to bring them to hospital for treatment and this would have altered significantly the final average figures.

Conclusion

These two studies have demonstrated that patients are capable of assessing, in monetary terms, the cost of a physiotherapy treatment, although these assessments are considerably higher than the actual

costs incurred. The actual costs offered £6.90 for the hospital treatment and £7.90 for the domiciliary treatment closely match the actual charges made by the eight physiotherapists in private practice in the Birmingham area. Their charges range from £5.50 - £12.00 per treatment with the most frequently quoted charge being £7.00. The patients were asked after they had made their valuation of a treatment on what they had based their estimation. Most quoted TV, washing machine repairs as a basis, although several quoted private fees charged by doctors in the area.

While it is quite clear that there is a significant economic benefit to the state in the provision of physiotherapy treatment to the working population it is as yet unclear how this benefit might be measured in the case of the elderly patient. The possible benefits arising from a domiciliary physiotherapy service to the elderly are listed on pages 233 and 234 and discussed on the succeeding pages.

In the short study of the treatment of neck and back patients, no attempt was made to estimate the value to a patient of the relief of pain and the restoration of normal movement and it is assumed that the value that the patient assigned to the treatment took account of this. If this were the case and the actual average cost of the treatment was subtracted from the estimated value, it might be the case that this figure would reflect the value assigned to pain relief and other intangible benefits. As an example, this would result in approximately £5 for each treatment being the value of pain relief and restoration of movement for both hospital and domiciliary treatment.

This sum closely matches the average cost of £5.97 per treatment, as shown on page 173, for the second domiciliary sample of 200 elderly patients. While the patient may value the treatment at more than the cost of providing it. There is no evidence as yet that the state has

benefited from the existence of the domiciliary physiotherapy service in terms of $(B - C) > 0$. It could be argued, however, that as old age is inevitable the provision of a domiciliary physiotherapy service is a necessary investment in human capital. The cost involved should be traded off against the income generated during a person's working life with the concomitant benefit to the state. It is quite clear from this limited study that physiotherapy treatment can enable a person to more speedily return to work. This finding confirms an earlier study of Gillette Industries Ltd (1973) which showed the financial benefit to the company arising from physiotherapy treatment to be three times the cost of its provision.

DOMICILIARY PHYSIOTHERAPY:

Cost and Benefit

CHAPTER VI

Developments and Recommendations

Introduction

The main study set out to investigate a domiciliary physiotherapy service with regard to whether physiotherapy treatment could be provided on a domiciliary basis which could be as effective as the hospital based equivalent and would be provided at an economically acceptable level.

The study commenced with an investigation into the provision of a physiotherapy service to the elderly patient, described on pages 78 - 130. Unforeseen problems with the randomization of the sample coupled with measurement methods which were not 'tight' meant that, in the absence of a control group, inferences could not be drawn which would help to confirm whether the provision of a domiciliary physiotherapy service would produce a positive benefit.

A second sample of 200 patients, described on pages 131 - 174, which utilized a similar methodology had similar weaknesses. Nevertheless, these samples did provide considerable information concerning the cost of providing a domiciliary physiotherapy service and with regard to the conditions referred and the effectiveness of the physiotherapy treatment. As well as this detailed experience was gained in the operation of such a service.

During the final year of the study it proved possible to apply the proposed randomization and sampling procedures to a sample of patients with acute neck and back conditions, described on page 209 and this group of patients provided certain evidence which could be quantified in monetary terms as the patients studied were mainly in employment. The other subsidiary studies associated with the main study also provided information which was relevant to the study and in certain instances led to developments within the service.

Extract from the three year development plan
Health Care Planning Team for the Elderly, SBHD 1980-1-2-3

(vii) Introduce Personalised Clothing Service

In accordance with programme and levels contained in the District Laundry Manager's report April 1980, accepted by the Geriatric service.

"Geriatric Division

Introduce a comprehensive clothing system on two wards at Moseley Hall Hospital. (Paras 6.3 and 6.3.1 of the Linen Service Manager's Report refer).

Revenue cost	£ 6,500
Capital cost	£ 7,250

Introduce a comprehensive clothing system on two wards at West Heath Hospital.

Revenue cost	£ 6,500
Capital cost	£ 10,100"

(viii) Provision of Centralised Staff Changing Accommodation at Joseph Sheldon Hospital as per attached scheme

Capital cost	£ 40,000
--------------------	----------

(ix) Improvement of Physiotherapy Services

To meet the demands of increasing elderly population and emphasis from secondary to community care.

The throughput of patients has increased three-fold and in consequence the nature of work has changed considerably in the past four years. Changes in policy have meant that many patients need to be nursed at home and will receive whatever rehabilitation is necessary on a domiciliary basis. It is clear that a domiciliary physiotherapy service to the elderly is cost effective. At present the service is largely confined to the elderly with over 95% of the patients treated being aged 65 or over. With the extension of this domiciliary care there is an increased demand placed upon the community physiotherapy staff; the community physiotherapist service requires three additional physiotherapists phased over this planning period.

The domiciliary physiotherapy service is now an accepted part of the overall service to the patient within the South Birmingham Health District. The planning proposals for the District for the next three years propose a steady extension of the physiotherapy service in the community and the relevant proposal is shown on page 226. This in itself is a major measurement of the value of this service which by its results has proved itself worth a place within the community team. When the inauspicious beginning to the study is recalled it can be seen that the benefit of such a service has been recognised by the decision makers within the District.

Experience gained during the course of the study has suggested that various development might improve the overall impact of the domiciliary physiotherapy service and these include the use of unqualified help in the community as well as the development of a physiotherapy clinic in the Katie Road Health Centre. Both of these extensions of the service are described below.

The Use of a Physiotherapy Aide in the Community

A significant proportion of the patients referred to the domiciliary physiotherapy service have required help and treatment which was considered not to require the skills of a qualified physiotherapist. A study into the nature of a physiotherapy treatment, described in Appendix 9, had showed that a physiotherapy aide could, with appropriate advice from the physiotherapist, provide an acceptable treatment.

The selection of this individual needed to be based on her personality score on the Eysenck Personality Index and it was found that those physiotherapy helpers whose personality most closely matched the personality of the average physiotherapist, as described by Childs (1978), were able to perform a physiotherapy treatment

which was indistinguishable from a treatment given by a qualified physiotherapist, Frazer (1980)(1).

The type of patient considered most suitable for treatment by the physiotherapy aide were the group loosely defined as the young handicapped. These included patients with disseminated sclerosis, paraplegia, hemiplegia, poliomyelitis and so on. These patients have presented a longstanding problem to the health service as they are the victims of a disabling condition and there are very few young chronic sick units available in this country. When these patients become too disabled to be able to remain at home they are admitted to either a geriatric ward or to a mental hospital, as in the case of a recent patient, in Scotland.

It is expected that a weekly visit by an experienced physiotherapy aide with an appropriate temperament and ability and adequate support from her physiotherapy colleagues, will be instrumental in maintaining these patients at home and prevent hospital admission for as long as possible. This service will be provided at a fraction of the cost of a qualified senior physiotherapist and the comparative costs are shown below.

The physiotherapy aide chosen to take part in the pilot study of such a service was working in the Royal Orthopaedic Hospital and had taken part in the experiment mentioned above. She had out-performed several of the physiotherapy staff during the course of the experiment and her personality was considered suitable. She had had four years experience in the treatment of hemiplegia patients in a geriatric hospital and could be considered to be competent and capable.

The main method of measurement of her effectiveness was a 'state of health' questionnaire developed by the Maudsley Hospital which provided an accurate reflection of the patients mental state.

This questionnaire is shown overleaf and is given to the patient on the initial visit. The patient is asked to complete it and return it by pre-paid envelope to the author. A final questionnaire is completed at the end of the twelve week treatment period. The cost of the treatments are also measured in the same way as for the main study.

Salary costs account for about a third of the total cost of any one physiotherapy treatment, travel costs including mileage allowance and travelling time account for about one quarter of the total cost of the treatment with the remainder of the cost made up by the costs shown in the tables on pages 121 and 162.

Since the beginning of the study there have been a number of major pay awards and the salary costs are likely to form a larger proportion of the overall treatment costs. When the study began the hourly rate for the physiotherapist was £1.9855 whereas at present rates it is £3.6346, an increase of about 60%. Other costs have risen along with inflation which is estimated at 20% and it can be seen that salary costs have increased out of proportion to the other costs. It will, therefore, be more economic to offer unqualified help with professional support for certain groups of patients as the hourly rate for an experienced physiotherapy helper is £1.9989 which is just over half the cost of a physiotherapist.

Physiotherapy Clinic in a Health Centre

The second development involved the setting up of a physiotherapy clinic within Katie Road Health Centre which is staffed by a member of the domiciliary physiotherapy staff on two afternoons each week.

This service is also being evaluated and is seen as a logical development of the overall community service. The patients who

FIG. 31

GENERAL HEALTH QUESTIONNAIRE

12 items

HAVE YOU RECENTLY:-

Please circle most appropriate answer

	Better than usual	Same as usual	Less than usual	Much less than usual
1. been able to concentrate on whatever you're doing?	Not at all	No more than usual	Rather more than usual	Much more than usual
2. lost much sleep over worry?	More so than usual	Same as usual	Less useful than usual	Much less useful
3. felt that you were playing a useful part in things?	More so than usual	Same as usual	Less so than usual	Much less capable
4. felt capable of making decisions about things?	Not at all	No more than usual	Rather more than usual	Much more than usual
5. felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6. felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7. been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8. been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
9. been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10. been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11. been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12. been feeling reasonably happy all things considered?	More so than usual	About the same as usual	Less so than usual	Much less than usual

attend the clinic are mainly within the walking distance of the Health Centre and include all age groups. There has been a majority of orthopaedic conditions treated although several patients with strokes are undergoing treatment. The physiotherapist is able to treat twice as many patients during her clinic as she would have treated on a domiciliary basis and this type of service is obviously economic but detailed figures will not be available for some time

One development which has been influenced by the success of the domiciliary physiotherapy service is the launching of the domiciliary occupational therapy service, based on the study described in this report. The circular letter, shown overleaf, describes this development which demonstrates one spin-off from the domiciliary physiotherapy service.

Costs of a Domiciliary Physiotherapy Service

Detailed information has been obtained from the study regarding the costs involved in such a service and these are discussed in detail in Chapters 2 and 3.

The most valuable item of information available to any doctor who intends to refer a patient for domiciliary physiotherapy treatment is that each treatment is likely to cost approximately £5.97*. This figure includes transport and the cost of disposables. The doctor will also be aware that the average course of treatment is ten treatments and will be able to plan his management of the patient's case, based on probable total cost and outcome. The success rate for the patients referred during the course of the study was just over 50% and it is possible to provide a table showing the expected outcome

* this figure is just over a third of the cost of a hospital treatment involving ambulance transport.

JOSEPH SHELDON HOSPITAL

Telephone: 021 453 3771
Extn:397

Bristol Road South,
Rubery,
Birmingham B45 9BA

February, 1981

OCCUPATIONAL THERAPY DEPARTMENT

Dear

Following the successful launching of the local Domiciliary Physiotherapy Service we are planning to extend the scope of our Service on the same lines for those patients of 60+

Staff from the Occupational Therapy Department here are prepared to visit, treat and report on any elderly patients you or your health team think would benefit from rehabilitation. Help and advice would be given for cooking difficulties, safety problems and adjustments/assessment of aids.

We are hoping to build this Service into a worthwhile project, believing there is a need in the community for active rehabilitation outside the hospital setting. Alongside this we are costing the enterprise - an important factor at this time, and will be keeping careful notes to see if it is financially viable.

Enclosed are some treatment cards in case you have patients you would like us to visit. If you have any questions about the scheme, one of us would be only too pleased to visit you, or telephone us on the number above.

Yours sincerely,

E.Gingell, B.A.O.T.

G.Nelson, B.A.O.T.

M.Reynolds, B.A.O.T.

FIG. 32 : Development of a Domiciliary Occupational Therapy Service.

and cost for various types of conditions treated during the course of the study and based on information obtained from the sample of 600 patients studied in detail, is shown on pages 237 & 238.

A doctor will then be aware that if he refers a patient with a stroke the patient will probably receive six treatments at a cost of £36, with a greater than 50% chance of regaining some degree of independence even on occasions preventing an admission to a hospital bed.

Inflation will cause this treatment cost to rise and the frequent rises in the cost of motor fuel will also be a factor in the evaluation. The D.H.S.S. National Working Party on Patient Transport Services, Naylor (1981), states that the biggest expenditure on ambulance services in England 1978/79 was £124 million, with the total number of patients carried 22.1 million. This gives a rough cost of £5.64 per patient. This figure applies to each journey and the overall cost for ambulance travel would be about £11 per visit to the hospital department. These increases are not considered to be significant as they are applied equally to alternative systems of care.

Benefits from a Domiciliary Physiotherapy Service.

There are probable social benefits which have not yet been identified and are perhaps unmeasurable. One example is the knowledge that such a service exists and the effect that this knowledge might have on people who are not yet patients. It is reassuring to know that if disease or incapacity should strike, that a physiotherapy service will be available.

There are certain benefits which have been identified during the course of the study and these are listed overleaf.

1. Many of the physical disabilities of the patients referred to the service can be alleviated by appropriate physiotherapy treatment.
2. As there has been no improvement in the ambulance service during the course of the study, it is clear that a domiciliary physiotherapy service is an effective way to provide treatment to the patient who is unable to travel independently to hospital.
3. There is a minimum of equipment required to be able to provide a domiciliary physiotherapy service.
4. The patient's relatives are able to provide considerable help at no cost to the state.
5. The involvement of the relatives in the day to day treatment of the patient can reduce the number of visits that need to be made by the physiotherapist.
6. The involvement of relatives with the physiotherapy staff has increased public awareness of the importance and significance of the profession, as the letter overleaf demonstrates.
7. Patients who previously would have been denied physiotherapy treatment now have access to such treatment.
8. The cost-effectiveness of the geriatric day hospitals is in question and rehabilitation can be provided within the patient's home without the need for expensive and inefficient ambulance services.
9. In certain cases hospital admission can be avoided with the help of the domiciliary physiotherapist.
10. Treatment given within the patient's home is more relevant to him and his relative and involves him in little inconvenience, no discomfort and minimal strain.

Selly Oak Hospital

Raddlebarn Road, Selly Oak, Birmingham B29 6JD

Telephone: 021-472 5313

Ext 4303

Birmingham Area

Health Authority (Teaching)

South Birmingham

Health District

Our Ref: Div. of Geriatric Medicine Your Ref:

3 November 1980

Mr F W Frazer
District Physiotherapist
Department of Physiotherapy
SELLY OAK HOSPITAL

Dear Mr Frazer

In my opinion the advent of the domiciliary physiotherapy service in the South District has been of great benefit to the services provided by the Geriatric Unit.

It is my impression that some patients have not needed admission to hospital because of the efforts of the physiotherapy service and that we are also able to use the service to help maintain people at home following discharge from hospital.

Yours sincerely

Peter P. Mayer

J F Harrison

M A Chughtai

P P Mayer, Consultant Geriatrician

J F Harrison, Consultant Geriatrician

M A Chughtai, Consultant Geriatrician and Chairman, Division of Geriatric Medicine.

FIG. 33

LETTER FROM CONSULTANT MEDICAL STAFF

This study set out, three years ago, to determine the costs and benefits of a domiciliary physiotherapy service. There have been many problems, described in the text, which caused various changes in method and direction during the course of the study. The main findings are supported by factual evidence and there are other findings which at present must rely upon the informed opinion of the consultant medical staff. The letter reproduced page 235, is one example of the possible benefits arising from a domiciliary physiotherapy service which would require a much more expensive study to investigate.

Although the chosen methodology was unsuccessful in the main sample, it is still felt that this system could be an effective method of obtaining a satisfactory sample for future studies provided the service element could be avoided. A study has been in operation during the past year and a half investigating domiciliary physiotherapy for patients who have suffered falls and it has been found that for a satisfactory randomization to take place the physiotherapy staff must be able to pick the patient from a larger sample without having to worry whether the other patients might suffer because of the experiment, Obonye (1980).

Although the randomization of the sample had suffered, it should be stressed that the samples studied were all referred to the physiotherapy service from outside doctors and the author had no control over this and, therefore, the sample was random in the sense that it was a presenting sample.

The disparity between sample sizes in the case of the ambulance and no treatment groups makes it difficult to draw satisfactory inferences although the results from the no treatment group in the orthopaedic sample closely match those of the main study 'no treatment'

TABLE 52: Average Cost per Case, Sample 1. (August 1977 - August 1978.)

CONDITION	TOTAL TREATMENTS	TOTAL PATIENTS	AVERAGE R _x PER PATIENT	AVERAGE COST PER PATIENT @ £7.24/R _x
R.A.	105	11	9.5	£ 68
O.A.	456	43	10.5	£ 76
C. Spondylosis	13	1	13.0	£ 94
Frozen Shoulder	96	5	19.2	£139
L.B.P.	34	2	17.0	£123
C.V.A.	402	62	6.5	£ 47
Parkinsons	34	5	7.0	£ 50
D.S.	12	2	6.0	£ 43
Other C.N.S.	38	8	5.0	£ 36
Circulatory	36	6	6.0	£ 43
Bronchitis	18	3	6.0	£ 43
Other Respiratory	17	2	8.0	£ 57
Fractured Femur	123	12	10.0	£ 72
Other Fracture	44	8	5.0	£ 36
Hip Operation	16	3	5.0	£ 36
Other Orthopaedic	11	2	5.0	£ 36
Other Pain	97	} 13	11.0	£ 79
Other Conditions	54			

TABLE 53: Average Cost per Case, Sample 2. (September 78 - March 79)

CONDITION	TOTAL TREATMENTS	TOTAL PATIENTS	AVERAGE R _x PER PATIENT	AVERAGE COST PER PATIENT @ £5.97/R _x
O.A.	282	36	8	£ 48.00
R.A.	81	13	6	£ 36.00
C.V.A.	364	65	6	£ 36.00
Other Diseases	105	26	4	£ 24.00
Other Orthopaedic	77	13	6	£ 36.00
Fractured Femur	36	7	5	£ 30.00
Parkinsons	2	2	1	£ 6.00
Hip Operation	2	1	2	£ 12.00
L.B.P.	74	6	12	£ 72.00
Other C.N.S.	32	6	5	£ 30.00
Fractured Humerus	40	3	13	£ 78.00
D.S.	16	3	5	£ 30.00
Cervical Spondylosis	10	1	10	£ 60.00
Circulatory	15	2	7	£ 42.00
Other Fractures	1	1	1	£ 6.00
Pain	8	1	8	£ 48.00
Bronchitis	51	11	5	£ 30.00
Other Respiratory	11	2	5	£ 30.00
Amputee	7	1	7	£ 42.00

sample, with 68% showing no improvement in the case of the orthopaedic sample at the end of the three week period without treatment, and in the case of the main sample 'no treatment' period. Similar results are found among the waiting list patients in the main physiotherapy department and it is apparent that physiotherapy treatment can produce a significant change in the patient's physical condition.

It is quite clear that domiciliary physiotherapy treatment is as effective as the hospital based alternative although there are certain conditions which are more appropriately treated at home, such as stroke patients and those with certain types of arthritic conditions. Examination of the tables 9 and 24 on pages 103 & 150. of the text, show the numbers of treatments given for each condition plus a knowledge of the likely cost of an average treatment which will enable the physician to estimate the probable cost of the physiotherapist's intervention.

This is a major source of information as it allows the doctor to decide whether the cost of the physiotherapy treatment will be economically acceptable. It also allows the doctor to base his decision to refer a patient on clinical experience as it can be seen that the average course of treatment for any of the conditions referred can be estimated and tabulated. This has been done on the basis of the results from the two samples of 200 patients treated and the tables are shown on pages 237 and 238.

A further benefit which is difficult to measure is the extension of the physiotherapist's role and it is probable that there will be a continued expansion of the role in the future. This study has made clear the effectiveness and competence of these staff and has brought attention to the value of their presence in the community team.

It is also evident that domiciliary physiotherapy is of particular value to the elderly patient although this has been particularly difficult to evaluate in monetary terms.

It is not possible to show with certainty that there is an economic benefit to society by using the elderly patient as an example in a cost benefit analysis. The study on the orthopaedic sample has shown that it is possible with the younger age groups but a larger sample will be required before major inferences can be drawn. This study is continuing for a further year and results to date reflect the findings described in Chapter V.

LIMITATIONS OF THE STUDY

The weaknesses in the study design have been mentioned and these could be eradicated in a future study which should separate the clinical treatment service from the scientific investigation. The methods of assessment should also be modified to avoid, where possible, subjective measurement. One example of how this could be achieved would be the use of the portable video system to record a before and after film and the use of the Polgon goniometer and the Kistler force plates to record the patient's posture and movements before and following treatment course.

Domiciliary treatment is more expensive than hospital based physiotherapy except in the case of certain age groups with specific conditions such as strokes, where this study shows that the treatment costs are roughly similar for both treatment venue except for a patient who requires an ambulance to transport him to hospital when the cost of hospital based physiotherapy is about three times that of the alternative domiciliary treatment.

The cost of travel is a significant element in the total treatment cost for a domiciliary visit although the provision of a car and its maintenance is currently borne by the physiotherapist. When a car breaks down the physiotherapist is provided with a hire car for the period her own car is under repair. If a domiciliary physiotherapy service is of value to the community then this value should be recognised by supplying the staff concerned with a Crown car and providing petrol from the District source. The expenditure on such a vehicle would be set against the present regular users allowance and the mileage payments which the staff receive. It should also be possible to identify savings made against the probable cost of ambulances for the patients concerned.

This is a problem which has not been adequately discussed and which must be considered before any expansion of the domiciliary service could take place. The existence of a domiciliary physiotherapy service tends to create its own demand with the result that most of the problem patients in the District may ultimately be referred. This, in turn, can create an unfair burden on the physiotherapy staff who are inevitably obliged to 'harden their hearts' and refuse certain referrals. The nature of the work can also lead to feelings of isolation which, when coupled with the often physically heavy work, can lead to stress.

These difficulties are absent in the hospital based physiotherapy department and may hinder recruitment to the domiciliary service. A system of control is required to ensure that expensive inappropriate referrals are not received as well as monitoring the effectiveness of the service and maintaining a balance in the work-load of the domiciliary staff. This is an additional expense which adds to the overall cost of each treatment.

Conclusion

There have been a number of studies of domiciliary physiotherapy, Moore (1978), Compton (1979)(b) and Glossop (1979) which have looked at the provision of domiciliary physiotherapy in different parts of the country and have produced similar findings with regard to treatment, travel and waiting times, as well as conditions referred. However, they did not provide much detail on treatment outcome nor did they attempt to relate cost to benefit. It might be argued that any attempt to attach a cost value to the alleviation of pain or disability and the prevention of immobility is inhumane.

In the current economic climate it is obvious that a decision to spend money on a domiciliary physiotherapy service must be made on objective grounds and not be based on emotional judgements. Most major decisions regarding health care and its provision are made by politicians and the administrators and studies such as this and the others mentioned above can contribute to the pressure group activity which surrounds the decision making process within the National Health Service. If the theory of Human Capital investment, as described, is accepted then such pressure group activity is instrumental in drawing the attention of the relevant Minister to the particular service offered.

The presence of a domiciliary physiotherapy service matches a demand in the community and brings the advantages of physiotherapy treatment to many patients previously deprived of physiotherapy treatment. This can be seen to be an investment in human capital on the part of the state and it is important that the decision makers should have as much available information presented to them as possible. This study shows that patients who could, in practice, have been given physiotherapy treatment either at home or in the hospital,

the treatment would be equally effective in either venue. Garland (1978) states that the elderly exist in the community in a very precariously balanced state. The support they do or do not receive in their homes is of paramount importance as to whether they survive or not. It is also stated that the transfer to an overcrowded geriatric ward of a hospital is often fatal, Hampstead Old Peoples Housing Trust (1977).

During the course of this study it has been demonstrated that a domiciliary physiotherapy service can help to maintain old people at home and can postpone or prevent admission to hospital (Fig. 34 overleaf). The incremental cost of meeting this extra commitment within the community may be offset by the reduction in hospital admission and a consequent reduction in the number of geriatric beds. There has been a reduction in geriatric beds within the South Birmingham Health District of ninety beds during the course of the study. There is no claim that the presence of the domiciliary physiotherapy service has contributed to this fact and more detailed study is required before any conclusions could be made. A related question whether the health improvements brought about as a result of the provision of a domiciliary physiotherapy service are worth the outlay made on it is answered in part by the results obtained for the small sample of orthopaedic patients described in the preceding chapter.

The report by Beveridge (1942) which stated that there should be a provision of a free National Health Service to everybody: 'a health service providing full preventative and curative treatment of every kind to every citizen without exceptions, without remuneration limit and without an economic barrier at any point to delay recourse to it' is an example of the human capital approach to health care. In this sense domiciliary physiotherapy can be seen to provide an

FIG. 34

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021-453 3516

14 Leach Green Lane,
Rubery,
Birmingham.

our ref DC/GAB

31st October 1980

Mr Fraser
Senior Physiotherapist
Selly Oak Hospital
Raddlebarn Road
Selly Oak

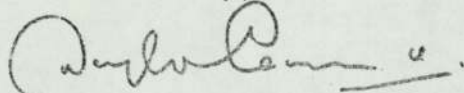
Dear Mr Fraser,

Re: Mrs E Burrows, 27 Farren Road, Northfield.

You probably are aware that this patient of mine has a very severe generalised rheumatoid arthritis and has recently had the most severe exacerbation of her condition that she has ever experienced. Such was the severity that she was bed-bound for several weeks, and there was no doubt that although initial medical treatment was the only possible way of coping with her flare-up, her subsequent recovery and mobilisation has been due to the very attentive and skilled care of Miss Price.

The fact of the matter is that if Domicillary Physiotherapy had not been available, Mrs Burrows would have been in hospital for a period of about 4 months at the very least, this being the extent of her illness from the beginning to her present state of mobility. I very much appreciate the facility of the service that you have established.

Yours sincerely,



Dr D Cresswell.

Doctor's Letter Illustrating Effect Of Domiciliary
Physiotherapy On One Of His Patients.

essential service to the patient who 'needs' it. This philosophy suggests that if all needs were to be met, the cost of the provision of health care would be infinite and that some form of cost benefit basis should, therefore, be used to ensure a rational approach to this problem.

FINANCIAL INFORMATION PROJECT

This project is a major research project implemented by the D.H.S.S. which seeks to identify the costs incurred in providing health care. A pilot study has been completed and the South Birmingham Health District is one of the areas being studied within this project. There have been a number of visits to the author by members of the Project Team who have sought information and advice regarding the costing methods used in the study of domiciliary physiotherapy. The author has been asked to join the Financial Information Project Steering Group and was asked to make the data from this study available to the Financial Information group for further analysis.

The extract from the Financial Information Project Steering Group's explanatory booklet provides a number of questions which can be used as a test for the findings described in this report and the answers which might be given to these questions are listed below. A copy of the research programme is shown in Appendix 15.

Taking these questions as a test of the study described in this report, the answers which might be given are as follows:

- (a) Page 121 and pages 161 - 173 answer this question with regard to the domiciliary physiotherapy service.
- (b) This cost will depend upon the inflation percentage as well as on future rises in salaries and travel costs.

include costs incurred by the patient in gaining access to the system, costs incurred by the state in terms of sickness payments and foregone economic production, and costs incurred by relatives or neighbours, for example, in terms of time. Whilst social costs are relevant to health care planning, their assessment depends on information generated outside the health service, and this limits their consideration in this paper.

2.2 The Need for Costs

The different notions of cost outlined above serve important uses in two distinct fields: firstly for the financial control of services, and secondly for the planning and evaluation of health care policies. Most of the existing costing systems relate to the first activity, but this paper is primarily concerned with the second. The vast majority of planning issues raised in consultation and observed in planning submissions suggest a need for cost information relating to the different cost concepts outlined above, and can be related to one or more of the categories of question listed below:

- (a) What is the present cost of providing a given treatment/service at its existing level?
- (b) What will be the cost of providing a given treatment/service (at a specified level) at a particular time in the future?
- (c) What will be the cost of providing a given treatment/service (at a specified level) in one location as compared with another location?
- (d) What is the cost of providing a given service/treatment to different population subgroups with particular sets of clinical or social characteristics?
- (e) What will be the cost of increasing the capacity of a given service by a certain percentage or, alternatively, what increase in that service can be achieved by injecting a given amount of money?
- (f) What savings will be achieved by a certain percentage reduction in the capacity of a given service or, alternatively, what reduction in that service is necessary to effect a particular level of saving?
- (g) What will be the cost of providing one type of service/treatment instead of another type (at specified levels)?
- (h) What will be the cost of increasing by a defined margin the effectiveness of a given service/treatment or, alternatively, what increase in effectiveness of that service/treatment can be achieved by an injection of a given amount of money?

4.

FIG. 35

Extract from page 4 of the Information Booklet outlining the aims of the Financial Information Project.

- (c) Page 129 and page 173 answer this question.
- (d) The tables on pages 237 and 238 answer this question.
- (e) This answer can be estimated by extrapolating from the information provided on pages 120 - 127 and 161 - 173.
- (f) This question can be answered by reference to the tables for (e) above.
- (g) This question might be partly answered by the information on pages 209 - 224.
- (h) It is not clear whether effectiveness of treatment is dependent upon the amount of money devoted to a particular service or a treatment. It has been shown that domiciliary treatment requires a minimum of equipment. It has also been shown that patients who required more than the mean number of treatments achieve less in term of outcomes. Accurate diagnosis is of more significance in this respect.

SUMMARY OF CONCLUSION

This study has shown that domiciliary physiotherapy is an effective way of providing such treatment to patients at a cost which can be readily identified and which compares favourably with alternative sources of treatment. The study began as an idea which has been translated into a fully developed and expanding service with three full-time and two part-time staff who have helped to close a gap in the previous provision of health care in the community, especially in the case of the elderly, the young chronic sick, and the patient who is unable to travel to hospital for his treatment.

RECOMMENDATIONS

1. Referrals should only be accepted from members of the medical profession as this will help to prevent inappropriate referrals.
2. The domiciliary physiotherapy service should be made available to all age groups and conditions although certain conditions might merit priority.
3. A course of domiciliary physiotherapy treatment should be restricted to ten treatments in the first instance.
4. Assistance with car purchase should be provided for the staff involved.
5. Speedier reimbursement of travelling expenses.
6. Staff levels should be reviewed annually and based on workload.
7. The domiciliary physiotherapy service should maintain close links with the hospital base and not be regarded as a separate entity.
8. Advice on claims for tax relief for use of car as a business expense should be available.
9. Domiciliary physiotherapy should be available only to a patient who cannot make his own way to the hospital physiotherapy department.
10. Ambulances should not, under the present system, be used as a method of transporting the elderly or very ill patient to the hospital physiotherapy department.

Domiciliary Physiotherapy;

Cost and Benefit

A P P E N D I C E S

APPENDIX 1

MEASUREMENTS USED IN THE STUDY

SOUTH BIRMINGHAM HEALTH DISTRICT
COMMUNITY PHYSIOTHERAPY
PHYSIOTHERAPY ASSESSMENT FORM

COMMUNITY PHYSIOTHERAPY

PATIENTS NAME.....AGE.....SEX.....
 ADDRESS.....

	P	H	Y	S	I	O	DATE
ASSESS- MENT ON FIRST VISIT							
ASSESS- MENT ON SECOND VISIT							

DOCTOR.....
 PHYSIOTHERAPIST.....

P	PHYSICAL CONDITION INCLUDING DISEASES OF THE VISCERA AND CEREBRAL DISORDERS. 1. NO ABNORMALITIES 2. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 3. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
H	HEAD, SHOULDERS, UPPER LIMBS AND TRUNK. 1. NO ABNORMALITIES 2. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 3. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
Y	MOBILITY, INCLUDING PELVIS AND LOWER LIMBS 1. NO ABNORMALITIES 2. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 3. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
S	SENSORY PAIN. 1. NO ABNORMALITIES 2. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 3. SEVERE ABNORMALITIES, CONFINED TO BED/CHAIR
I	INCONTINENCE AND EXCRETORY FUNCTION 1. COMPLETE CONTROL 2. OCCASIONAL STRESS INCONTINENCE 3. PERIODIC BOWEL / BLADDER INCONTINENCE / RETENTION 4. TOTAL INCONTINENCE
O	OTHER, INCLUDING MENTAL STATE 1. NO ABNORMALITIES 2. MODERATELY SEVERE ABNORMALITIES REQUIRING ATTENTION 3. SEVERE ABNORMALITIES REQUIRING COMPLETE SUPERVISION

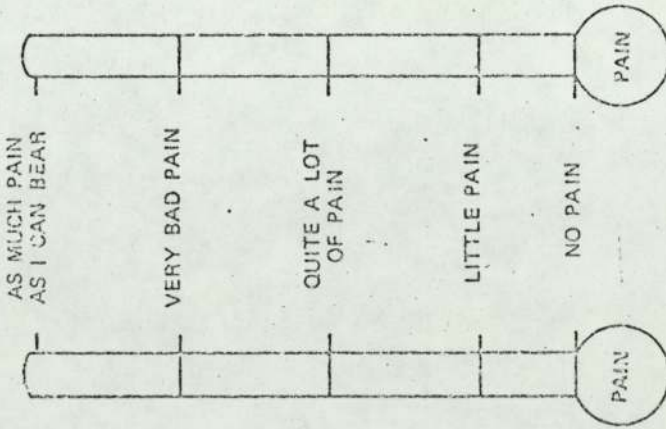
FIG. 36

PHYSIO ASSESSMENT CARD

SOUTH BIRMINGHAM HEALTH DISTRICT
COMMUNITY PHYSIOTHERAPY

M/F	Surname	Forenames
Address		
National Health Service Number		Date of Birth

PAIN THERMOMETER



Name
Address
G.P.
Referred by
Diagnosis.
Treatment commenced
discharged
Physio

Date of Birth
Age
Tel

Signed

SE180

FIG. 37 PAIN THERMOMETER

FIG. 38 FILING CARD

Appendix C

COMMUNITY PHYSIOTHERAPY
ASSESSMENT GRID

NAME..... AGE.....
 ADDRESS.....
 DISTRESS.....

	1	2	3
1			
2			
3			
4			
5			
6			
7			

COMMUNITY PHYSIOTHERAPY

ASSESSMENT GRID

THE ASSESSMENT GRID PRESENTS A TWO DIMENSIONAL CHARACTERIZATION OF PATIENTS STATE, BASED ON:—
 (1) THE OBSERVABLE STATE OF THE PATIENTS DISABILITY.
 (2) PATIENTS SUBJECTIVE FEELINGS OF DISTRESS.

DISABILITY

- (1) NO DISABILITY
- (2) INDEPENDENTLY MOBILE, LIMITED TO LIGHT HOUSEWORK AND SHOPPING.
- (3) LIMITED MOBILITY: ABLE TO DO LIGHT HOUSEWORK,
- (4) HOUSEBOUND: ABLE TO DO LIGHT HOUSEWORK.
- (5) HOUSEBOUND: LIMITED TO SELF CARE ACTIVITIES.
- (6) HOUSEBOUND: REQUIRING HELP WITH SELF CARE.
- (7) CHAIRBOUND: REQUIRING HELP WITH SELF CARE.
- (8) TOTALLY DEPENDENT.

DISTRESS

- (1) NONE
- (2) MODERATE
- (3) SEVERE

THIS CLASSIFICATION ENTAILS A MATRIX OF 24 POSSIBILITIES WHICH CAN BE ASSESSED BEFORE AND AFTER TREATMENT PERIOD, A GENERAL MOVEMENT UPWARDS AND TO THE LEFT SHOULD BE OBSERVED IF TREATMENT IS HAVING POSITIVE EFFECT.

DOCTORS SIG..... DATE.....
 PHYSIOTHERAPISTS SIG..... DATE.....

FIG. 39 ASSESSMENT GRID

COMMUNITY PHYSIOTHERAPY

NAME

AGE

ADDRESS

DATE

G.P.

FOLLOWING A COURSE OF PHYSIOTHERAPY	MUCH WORSE	SLIGHTLY WORSE	NO CHANGE	SLIGHTLY BETTER	MUCH BETTER
1. AT HOME					
2. IN HOSPITAL					
3. WALKING					
4. PAIN					
5. STIFFNESS					
6. STRENGTH					
7. BALANCE					
8. CLIMBING STAIRS					
9. DRESSING					
10. GENERAL HEALTH					

FIG. 40 PATIENT SELF ASSESSMENT CHART

THERAPIST RATING SCALE

The rating scale below is a semantic differential scale. The person doing the rating describes the therapist by choosing a point in a response continuum containing two opposite descriptive terms, one on each side of the scale. Please complete this scale immediately upon completion of your treatment.

								<u>Score</u>	<u>Code</u>	
Warm-hearted	---	---	---	---	---	---	Cold-hearted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Selfish	---	---	---	---	---	---	Unselfish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competent	---	---	---	---	---	---	Incompetent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very Like Myself	---	---	---	---	---	---	Not At All Like Me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scatterbrained	---	---	---	---	---	---	Sensible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional	---	---	---	---	---	---	Unprofessional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tolerant	---	---	---	---	---	---	Harsh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-assured	---	---	---	---	---	---	Worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friendly	---	---	---	---	---	---	Unfriendly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dull	---	---	---	---	---	---	Stimulating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specific	---	---	---	---	---	---	Vague	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insincere	---	---	---	---	---	---	Sincere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organised	---	---	---	---	---	---	Disorganised	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rigid	---	---	---	---	---	---	Adaptable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steady	---	---	---	---	---	---	Erratic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cheerful	---	---	---	---	---	---	Quiet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poised	---	---	---	---	---	---	Excitable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impatient	---	---	---	---	---	---	Patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sense of Humour	---	---	---	---	---	---	No Sense Of Humour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inexperienced	---	---	---	---	---	---	Experienced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Therapist

Patient Date

FIG. 42 PERSONALITY ASSESSMENT

Scott Birmingham Health District

Community Physiotherapy

Name Age

Address

Referred By: Date

General Practitioner

Diagnosis

Treatment

<u>Date</u>	<u>Total Treatment Time (minutes)</u>	<u>Total Travel Time (minutes)</u>	<u>Total Distance Travelled (miles)</u>
TOTAL			

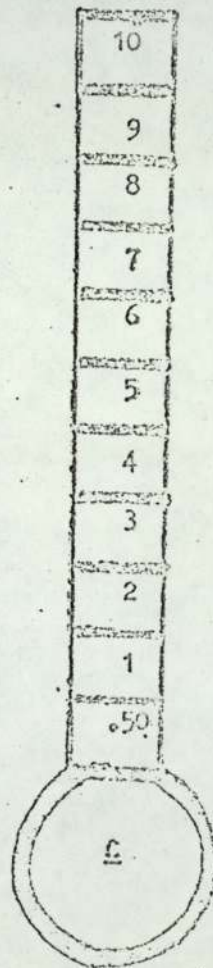
FIG. 43 PHYSIOTHERAPIST JOURNEY RECORD

PHYSIOTHERAPY DEPARTMENT

A study is being carried out to try to determine the value of physiotherapy treatment in monetary terms.

Will you please indicate on the scale below what you feel might be the price of a physiotherapy treatment if it were on sale in the market.

Thank you for your co-operation.



Diagnosis

D.O.B.

H / R

FIG. 44 TREATMENT VALUATION SCALE

COMMUNITY PHYSIOTHERAPY

DATE.....

NAME..... AGE.....

ADDRESS.....

G.P.....

1. LIVING ALONE..... WITH SPOUSE..... WITH RELATIVE.....
2. ABLE TO COPE..... REQUIRING HELP.....
3. HELP AVAILABLE FROM RELATIVE..... NEIGHBOURS..... FRIENDS.....
ORGANIZATIONS..... OTHERS.....
4. HELP AVAILABLE FULL-TIME... DAYTIME... NIGHTTIME... IRREGULAR... NONE...
5. PERSON PROVIDING HELP ABLE TO COME..... REQUIRES ASSISTANCE.....
6. ACCOMODATION. HOUSE... FLAT... REDSITTER... HOSTEL... OTHER...
7. OWNERSHIP. SELF..... COUNCIL..... PRIVATE LANDLORD..... OTHER.....
8. RENT/RATE REBATE YES/NO.
9. HOT WATER YES / NO.
10. TOILET. UPSTAIRS..... DOWNSTAIRS..... OUTSIDE.....
11. BEDROOM UPSTAIRS / DOWNSTAIRS
12. HEATING ADEQUATE / INADEQUATE
13. TELEPHONE YES / NO NEAR AT HAND.....
14. BATH UPSTAIRS / DOWNSTAIRS NONE.....
15. STAIRS INSIDE / OUTSIDE NONE.....
16. INCOME OLD AGE PENSION., SUPPLEMENTARY PENSION., ATTENDANCE
ALLOWANCE.....
17. EMPLOYMENT FULL-TIME / PART-TIME
18. SERVICES ALREADY RECEIVED. HEALTH VISITOR.. DISTRICT NURSE.. HOME HELP..
MEALS ON WHEELS.. SOCIAL WORKER.. PHYSIOTHERAPY.. OLD PEOPLES CLUB.....
CHURCH / VOLUNTARY... BUS PASS.... OTHER... NONE....
19. PREVIOUS ADMISSION TO HOSPITAL NONE... OVER SIX MONTHS AGO
LESS THAN SIX.....
20. MEDICAL DETAILS DIAGNOSIS.....
CHEST.... HEART..... C.N.S. G.I.T..... OTHER.....
ORTHOPAEDIC, UPPER LIMB.... LOWER LIMB... SPINE... OTHER.....
SURGICAL, ABDOMINAL..... CHEST.... OTHER.....
PREVIOUS SEVERE INJURY.....
MEDICAL ILLNESS.....
OPERATION.....
NONE.....
21. PRESENT MENTAL CONDITION ALTER... UN-COOPERATIVE. MILD CONFUSION...
AGGRESSIVE.....

-
22. MOBILITY FULLY MOBILE + STAIRS - STAIRS.....
 ABLE TO WALK 20 FEET.....
 ABLE TO WALK WITH AIDS..... CHAIR / BEDFAST.
23. SELF CARE ABLE TO FEED SELF.....NEEDS HELP.....
24. ABLE TO DRESS SELF - NEEDS HELP.....
25. ABLE TO WASH SELF..... NEEDS HELP.....
26. EYESIGHT GOOD..... FAIR..... POOR.....
27. HEARING GOOD..... FAIR..... POOR.....
28. CONTINENCE FULLY..... OCCASIONAL INCONTINENCE...
 INCONTINENCE OF URINE..... FAECES.....
29. ATTENDING OUT-PATIENT CLINIC... DAY HOSPITAL.....
30. HOLIDAYS REGULAR - NONE..... WITHIN LAST YEAR.....
31. REGULAR.... ORGANIZED..... NONE.....

FIG. 45 SOCIAL ASSESSMENT

SOUTH BIRMINGHAM HEALTH DISTRICT COMMUNITY PHYSIOTHERAPY	
MALE <input type="checkbox"/>	Surname
	Forenames
Address	
PHYSIOTHERAPY APPOINTMENTS	
DATE	CLINICAL NOTES

FIG. 46 APPOINTMENT CARD

Community Physiotherapist

Mrs. J. Burrell

Physiotherapy Department
 Selly Oak Hospital
 Raddlebarn Road
 Selly Oak
 Birmingham B29 6JD
 Tel. 472 5313 Ext. 4755 or 4324

FIG. 47 PHYSIOTHERAPISTS CALLING CARDS

Community Physiotherapist

Mrs. S. Rollason

Physiotherapy Department
 Selly Oak Hospital
 Raddlebarn Road
 Selly Oak
 Birmingham B29 6JD
 Tel. 472 5313 Ext. 4755 or 4324

SOUTH BIRMINGHAM HEALTH DISTRICT COMMUNITY PHYSIOTHERAPY	
MALE <input type="checkbox"/>	Surname
	Forenames
Address	
PHYSIOTHERAPY REPORT	
DATE	CLINICAL NOTES
SIGNED:	

FIG. 48 PHYSIOTHERAPY REPORT CARD

Selly Oak Hospital

Raddlebarn Road, Selly Oak, Birmingham B29 6JD
Telephone: 021-472 5313
Ext

Birmingham Area
Health Authority (Teaching)
South Birmingham
Health District

Our Ref: _____ Your Ref: _____

PHYSIOTHERAPY DEPARTMENT

Dear Doctor,

COMMUNITY PHYSIOTHERAPY

Patient's Name:
Address:
.....
.....

I would be grateful if you would forward your final assessment of the above named patient.

Yours sincerely

J Burrell, M.C.S.P.
Senior Community Physiotherapist
Physiotherapy Department
Selly Oak Hospital

FIG. 50 FINAL ASSESSMENT REQUEST

Selly Oak Hospital

Raddlebarn Road, Selly Oak, Birmingham B29 6JD
Telephone: 021-472 5313
Ext

Birmingham Area
Health Authority (Teaching)
South Birmingham
Health District

Our Ref: CP/SOH Your Ref: _____

Physiotherapy Department

Dear Doctor,

The above named patient has been referred to us by _____

Would you please visit this patient and complete an assessment card?
Thank you for your help.

Yours sincerely

Community Physiotherapy
Selly Oak Hospital

FIG. 49 ASSESSMENT REQUEST

**SOUTH BIRMINGHAM HEALTH DISTRICT
COMMUNITY PHYSIOTHERAPY**

MALE Surname _____ F Surnames _____

Address _____

National Health Service Number _____ Date of Birth _____

DATE	CLINICAL NOTES

SIGNED: SE180

DATE	CLINICAL NOTES

FIG. 51 CASE HISTORY CARD

GENERAL EXERCISES

LYING FLAT

1. Curl toes under. Straighten and open them.
2. Stretch feet down and pull them back
3. Turn feet in and out.
4. Roll feet each way
5. Tighten calf muscles (slow count to 6)
6. Tighten muscles above knee (slow count to 6)
7. Lift alternate leg off bed with straight knee
8. Bend and straighten alternate knees
9. Tighten seat muscles (slow count to 6)
10. Lift head - look at toes
11. Lift arms above head
12. Take 6 deep breaths
13. Turn head to right and left
14. Pull shoulder blades together and press neck into pillow (slow count to 6)
15. Bend and straighten elbows
16. Fingers behind neck - pull elbows back
17. Curl tips of fingers and thumb towards roots and open
18. Curl fingers and thumb into palms and open
19. Bend wrists down - bend wrists back
20. Roll wrists both ways
21. Touch tip of each finger in turn with the tip of the thumb

EXERCISES IN SITTING

1. Place hands on edges of thighs, little finger side down. Raise thumb then each finger in turn and relax
2. Fingers behind back - slide hands up and down
3. Bend body to right and left.
4. Turn body to right and left.

EXERCISES SHOULD BE PERFORMED EVERY MORNING.
LIE AS FLAT AS POSSIBLE FOR $\frac{1}{2}$ hr. DAILY.

FIG. 52 EXERCISE SHEET

GENERAL HEALTH QUESTIONNAIRE

12 items

HAVE YOU RECENTLY:-

Please circle most appropriate answer

	Better than usual	Same as usual	Less than usual	Much less than usual
1. been able to concentrate on whatever you're doing?	Not at all	No more than usual	Rather more than usual	Much more than usual
2. lost much sleep over worry?	More so than usual	Same as usual	Less useful than usual	Much less useful
3. felt that you were playing a useful part in things?	More so than usual	Same as usual	Less so than usual	Much less capable
4. felt capable of making decisions about things?	Not at all	No more than usual	Rather more than usual	Much more than usual
5. felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6. felt you could'nt overcome your difficulties?	More so than usual	Same as usual	Less so than usual	Much less than usual
7. been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less able than usual	Much less able
8. been able to face up to your problems?	Not at all	No more than usual	Rather more than usual	Much more than usual
9. been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10. been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11. been thinking of yourself as a worthless person?	More so than usual	About the same as usual	Less so than usual	Much less than usual
12. been feeling reasonably happy all things considered?				

FIG. 53 HEALTH QUESTIONNAIRE

TREATMENT RATING SCALE

The rating scale below is a semantic differential scale. The person doing the rating describes the treatment by choosing a point in a response continuum containing two opposite descriptive terms, one on each side of the scale.

Please complete this scale immediately upon completion of your treatment.

		<u>Score</u>	<u>Code</u>
Effective	— — — — —	Ineffective	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Vague	— — — — —	Specific	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Professional	— — — — —	Unprofessional	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Competent	— — — — —	Incompetent	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Unstructured	— — — — —	Planned	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Comfortable	— — — — —	Uncomfortable	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Special	— — — — —	Ordinary	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Dull	— — — — —	Stimulating	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Organized	— — — — —	Disorganized	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Unhelpful	— — — — —	Helpful	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Therapist

Patient

Date

FIG. 54

Depression

<u>Item or question</u>	<u>Response</u>	<u>Score</u>
1. No. of hobbies or interests e.g. reading, radio, television, handicrafts, cooking, gardening, walking, bingo	More than 3	0
	1 or 2	1
	None	2
2. Do you look forward to things at all?	Often	0
	Sometimes	1
	Never	2
3. Does the future ever seem pointless to you?	Never	0
	Sometimes	1
	Often	2
4. Does even the thought of having to do anything sometimes feel an effort to you?	Never	0
	Sometimes	1
	Often	2
5. Do you ever feel lonely?	Never	0
	Sometimes	1
	Often	2
6. How have you been in your spirits over the last few days - have you been happy or have you felt depressed.	Very happy	0
	Quite happy	1
	Neither happy nor depressed	2
	Quite depressed	3
	Very depressed	4
7. Have you recently felt so depressed that you have just sat for hours on end?	No	0
	Yes	2
8. Would you say you are content with your present way of life or are you dissatisfied?	Very content	0
	Quite content	1
	Little dissatisfied	2
	Very dissatisfied	3

Scores could range from 0 - 19.

FIG. 55 DEPRESSION TEST

FIG. 56 Injury or Disease - Cervical Spine / LUMBAR Spine

Name and Address	Place of Treatment	
	Home	
	Hospital	
	AGE	
	Date	

DIAGNOSIS

--

PAIN SCALE

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

No Pain Little Pain Moderate Pain Severe Pain As much Pain
as I can Bear

(Please circle the number which corresponds to your level of Pain)

Range of Movement

FLEXION	
EXTENSION	
SIDE FLEXION LEFT	
SIDE FLEXION RIGHT	
ROTATION LEFT	
ROTATION RIGHT	

STIFFNESS

YES	
NO	

PARASTHESIA

LEFT

NONE	
SLIGHT	
SEVERE	

RIGHT

NONE	
SLIGHT	
SEVERE	

DRUGS

YES	
NO	

NAME OF DRUG

WORK

OFF WORK AT WORK UNEMPLOYED RETIRED PLEASE CIRCLE

PAST HISTORY

1st Attack 2nd Attack 3rd Attack

COURSE

SPINDLE GRADUAL CHRONIC DATE of ONSET

--

FIG. 57 TREATMENT RECORD

DATE	TIME BEGINNING	TIME FINISHED	TOTAL TREATMENT	TRAVEL TIME		
				START	FINISH	TOTAL

TRACTION SUSTAINED / INTERMITTENT POUNDAGE
COLLAR
S.W.D.
U.SOUND
I. FERENTIAL
MANIPULATION
EXERCISES
ADVICE
ICE
OTHER

PHYSIOTHERAPIST

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required. Will you circle the statement which most accurately reflects your opinion.

Thank you for your help.

If you had to pay a charge of £2.00 for the physiotherapy treatment that you have just had, would you feel the following? Please circle the most appropriate response.

<u>Very Good Value</u>	<u>Quite Good Value</u>	<u>About Right</u>	<u>Quite Expensive</u>	<u>Very Expensive</u>
2	1	0	1	2

Name

Physiotherapist

Treatment

Date

FIG. 58

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required. Will you circle the statement which most accurately reflects your opinion.

Thank you for your help.

If you had to pay a charge of £4.00 for the physiotherapy treatment that you have just had, would you feel the following? Please circle the most appropriate response.

<u>Very Good Value</u>	<u>Quite Good Value</u>	<u>About Right</u>	<u>Quite Expensive</u>	<u>Very Expensive</u>
2	1	0	1	2

Name

Physiotherapist

Treatment

Date

FIG. 59

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required. Will you circle the statement which most accurately reflects your opinion.
Thank you for your help.

If you had to pay a charge of £5.00 for the physiotherapy treatment that you have just had, would you feel the following?
Please circle the most appropriate response.

<u>Very Good Value</u>	<u>Quite Good Value</u>	<u>About Right</u>	<u>Quite Expensive</u>	<u>Very Expensive</u>
2	1	0	1	2

Name

Physiotherapist

Treatment

Date

FIG. 60

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required.

Will you circle the statement which most accurately reflects your opinion.

Thank you for your help.

If you had to pay a charge of £5.00 for the physiotherapy treatment that you have just had, would you feel the following?

Please circle the most appropriate response.

<u>Very Good Value</u>	<u>Quite Good Value</u>	<u>About Right</u>	<u>Quite Expensive</u>	<u>Very Expensive</u>
2	1	0	1	2

Name

Physiotherapist

Treatment

Date

FIG. 61

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required. Will you circle the statement which most accurately reflects your opinion.
Thank you for your help.

If you had to pay a charge of £7.00 for the physiotherapy treatment that you have just had, would you feel the following?
Please circle the most appropriate response.

Very Good Quite Good About Quite Very
Value Value Right Expensive Expensive

2

1

0

1

2

Name

Physiotherapist

Treatment

Date

FIG. 62

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required. Will you circle the statement which most accurately reflects your opinion. Thank you for your help.

If you had to pay a charge of £3.00 for the physiotherapy treatment that you have just had, would you feel the following? Please circle the most appropriate response.

<u>Very Good Value</u>	<u>Quite Good Value</u>	<u>About Right</u>	<u>Quite Expensive</u>	<u>Very Expensive</u>
2	1	0	1	2

Name

Physiotherapist

Treatment

Date

FIG. 63

Physiotherapy Department

A study is being carried out into the costs involved in providing physiotherapy treatment and your assistance is required.

Will you circle the statement which most accurately reflects your opinion.

Thank you for your help.

If you had to pay a charge of £9.00 for the physiotherapy treatment that you have just had, would you feel the following?

Please circle the most appropriate response.

<u>Very Good Value</u>	<u>Quite Good Value</u>	<u>About Right</u>	<u>Quite Expensive</u>	<u>Very Expensive</u>
2	1	0	1	2

Name

Physiotherapist

Treatment

Date

FIG. 64

E.P.I.

FORM A

NAME..... AGE.....

OCCUPATION..... SEX.....

N=

E=

L=

Instructions

Here are some questions regarding the way you behave, feel and act. After each question is a space for answering "YES" or "NO".

Try to decide whether "YES" or "NO" represents your usual way of acting or feeling. Then put a cross in the circle under the column headed "YES" or "NO". Work quickly, and don't spend too much time over any question; we want your first reaction, not a long-drawn out thought process. The whole questionnaire shouldn't take more than a few minutes. Be sure not to omit any questions.

Now turn the page over and go ahead. Work quickly, and remember to answer every question. There are no right or wrong answers, and this isn't a test of intelligence or ability, but simply a measure of the way you behave.

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HODDER & STOUGHTON



FORM A

- 1. Do you often long for excitement? YES NO
- 2. Do you often need understanding friends to cheer you up? YES NO
- 3. Are you usually carefree? YES NO
- 4. Do you find it very hard to take no for an answer? YES NO
- 5. Do you stop and think things over before doing anything? YES NO
- 6. If you say you will do something do you always keep your promise, no matter how inconvenient it might be to do so? YES NO
- 7. Does your mood often go up and down? YES NO
- 8. Do you generally do and say things quickly without stopping to think? YES NO
- 9. Do you ever feel "just miserable" for no good reason? YES NO
- 10. Would you do almost anything for a dare? YES NO
- 11. Do you suddenly feel shy when you want to talk to an attractive stranger? YES NO
- 12. Once in a while do you lose your temper and get angry? YES NO
- 13. Do you often do things on the spur of the moment? YES NO
- 14. Do you often worry about things you should not have done or said? YES NO
- 15. Generally, do you prefer reading to meeting people? YES NO
- 16. Are your feelings rather easily hurt? YES NO
- 17. Do you like going out a lot? YES NO
- 18. Do you occasionally have thoughts and ideas that you would not like other people to know about? YES NO
- 19. Are you sometimes bubbling over with energy and sometimes very sluggish? YES NO
- 20. Do you prefer to have few but special friends? YES NO
- 21. Do you daydream a lot? YES NO
- 22. When people shout at you, do you shout back? YES NO
- 23. Are you often troubled about feelings of guilt? YES NO
- 24. Are all your habits good and desirable ones? YES NO
- 25. Can you usually let yourself go and enjoy yourself a lot at a lively party? YES NO
- 26. Would you call yourself tense or "highly-strung"? YES NO
- 27. Do other people think of you as being very lively? YES NO

- 28. After you have done something important, do you often come away feeling you could have done better? YES NO
- 29. Are you mostly quiet when you are with other people? YES NO
- 30. Do you sometimes gossip? YES NO
- 31. Do ideas run through your head so that you cannot sleep? YES NO
- 32. If there is something you want to know about, would you rather look it up in a book than talk to someone about it? YES NO
- 33. Do you get palpitations or thumping in your heart? YES NO
- 34. Do you like the kind of work that you need to pay close attention to? YES NO
- 35. Do you get attacks of shaking or trembling? YES NO
- 36. Would you always declare everything at the customs, even if you knew that you could never be found out? YES NO
- 37. Do you hate being with a crowd who play jokes on one another? YES NO
- 38. Are you an irritable person? YES NO
- 39. Do you like doing things in which you have to act quickly? YES NO
- 40. Do you worry about awful things that might happen? YES NO
- 41. Are you slow and unhurried in the way you move? YES NO
- 42. Have you ever been late for an appointment or work? YES NO
- 43. Do you have many nightmares? YES NO
- 44. Do you like talking to people so much that you never miss a chance of talking to a stranger? YES NO
- 45. Are you troubled by aches and pains? YES NO
- 46. Would you be very unhappy if you could not see lots of people most of the time? YES NO
- 47. Would you call yourself a nervous person? YES NO
- 48. Of all the people you know, are there some whom you definitely do not like? YES NO
- 49. Would you say that you were fairly self-confident? YES NO
- 50. Are you easily hurt when people find fault with you or your work? YES NO
- 51. Do you find it hard to really enjoy yourself at a lively party? YES NO
- 52. Are you troubled with feelings of inferiority? YES NO
- 53. Can you easily get some life into a rather dull party? YES NO
- 54. Do you sometimes talk about things you know nothing about? YES NO
- 55. Do you worry about your health? YES NO
- 56. Do you like playing pranks on others? YES NO
- 57. Do you suffer from sleeplessness? YES NO

Patient Number Male/Female

Age

Physiotherapist Male/Female

Pulse rate on application of Pulse Monitor		
Pulse rate following Five minutes rest		
Pulse rate on entry to cubicle of Physiotherapist		
Pulse rate after two minutes Infra-red		
Pulse rate on completion of five minutes to back		
Pulse rate when Physiotherapist re-enters cubicle		
Pulse rate when massage treatment commenced		
Pulse rate after two minutes massage		
Pulse rate when five minutes massage treatment ended		
Pulse rate one minute after Physiotherapist leaves cubicle		
Pulse rate when Physiotherapist returns to terminate treatment		

Date

FIG. 67 PHYSIOTHERAPY RESPONSE RECORD

PATIENT QUESTIONNAIRE

FIG. 68

This questionnaire is designed to investigate the reactions to the treatment which you have recently received. Your responses will be strictly confidential and will not be revealed to any person other than the research worker, and the questionnaire is entirely anonymous.

Thank you for your co-operation.

You are required to read five statements connected with your physiotherapy treatment and to circle the comment nearest to your own opinion.

1. The physiotherapist is good at his/her work.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>strongly</u>		<u>either way</u>	<u>agree</u>	<u>disagree</u>

2. The treatment is pleasant but not very effective.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>strongly</u>		<u>either way</u>	<u>Agree</u>	<u>disagree</u>

3. Physiotherapy treatment is not effective.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>Strongly</u>		<u>either way</u>	<u>Agree</u>	<u>Disagree</u>

4. Tablets from the doctor are preferable to physiotherapy treatment.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>Strongly</u>		<u>either way</u>	<u>Agree</u>	<u>Disagree</u>

5. The physiotherapist is an attractive person.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>Strongly</u>		<u>either way</u>	<u>Agree</u>	<u>Disagree</u>

APPENDIX 2

LIST OF REPORTS STUDIED IN PLANNING STAGE

LIST OF REPORTS STUDIED IN PLANNING STAGE

The Physiotherapist in the Community

A. Compton.

Department of Community Health, City of Southampton.

Report in Physiotherapy, Vol.59, No.3, 1973

Community Physiotherapy in Canada.

Report in Physiotherapy Vol.60, No.9, 1974.

Physiotherapy in the Community

M. K. Patrick

Report in Physiotherapy, Vol. 60, No.7

Domiciliary Physiotherapy Services

Burton, A., and Gau, D.W.

Letter in Lancet, June 22, 1975.

A Domiciliary Physiotherapy Service

Waters, W.H.R., Udy, S.C., Lunn, J.E.

Report in Lancet, May 1974.

Physiotherapy Services and Education at a Health Centre

K. M. Jenkins

Report in Physiotherapy, Vol.61, No.7., 1975.

APPENDIX 3

PLANNING PRIOR TO STUDY COMMENCEMENT

PLANNING PRIOR TO STUDY COMMENCEMENT

January 1976

The author presents a paper on community physiotherapy to the Health Care Planning Team for the Elderly, South Birmingham Health District.

5th February, 1976.

Above paper discussed, in the author's absence, by Professor Isaacs, Department of Geriatric Medicine, University of Birmingham, Dr. N. Smith, G.P. representative, Mrs. L. Ellis, Senior Nursing Officer, Community, Mrs. H. Cooper, Geriatric Health Visitor and Dr. J. Harrison, Consultant Geriatrician. They all were of the opinion that there was a need for such a service. It was agreed to discuss the report in detail at a subsequent meeting of the team.

8th April 1976.

Following a considerable exchange of ideas on the role and on the location of a community physiotherapist, it was agreed that the author should draw up a detailed scheme for a proposed study to evaluate the benefit to patients of a community physiotherapy service. Dr. N. Smith as G.P. representative was invited to co-operate and act as a liaison officer for his general practitioner colleagues.

10th June 1976.

Meeting informed that a protocol for a study on community physiotherapy would be presented at the next meeting of the Health Care Planning Team.

8th July 1976.

Protocol presented to the Team. It was agreed that Professor Isaacs, Dr. Harrison, Dr. Smith and the author should meet to discuss the details of the study and report back to the team.

12th August 1976.

Appointment of a Community Physiotherapist.

September 1976.

Report to the District Management Team that a trial of community physiotherapy was in hand.

20th October 1976.

Application to the District Management Team for permission to apply to the University of Aston, for consideration of the Community Physiotherapy project as the basis for a part-time M.Phil.

Request granted.

November 1976.

Forced postponement of project due to financial cut-backs within the District. No money was available for travelling expenses. Author approached a number of bodies requesting funds for this purpose.

APPENDIX 4

GP'S WHO CO-OPERATED IN THE SETTING UP
OF THE STUDY

G.P.'s WHO CO-OPERATED IN THE SETTING-UP OF THE STUDY

1. Dr. David Kirk
Dr. Sylvia Meux 1437 Pershore Road, Stirchley.

2. Dr. Harold Robinson 38 Alvechurch Road, West Heath.

3. Dr. Anthony Butler
Dr. R. C. Todman 2 Dial Close, Druids Heath.

4. Dr. F. Minwalla
Dr. Hewitt
Dr. Berry 22 Shenley Green, Northfield.

5. Dr. Raymond Davis
Dr. Douglas Fleming
Dr. Gareth Francis
Dr. Stephen Sales
Dr. Parkes Northfield Health Centre, St. Heliers Road,
Northfield.

6. Dr. Whitelaw
Dr. Keegan
Dr. Norman Smith
Dr. John Matthias
Dr. Asbury 223 Longbridge Lane, Birmingham, 31.

7. Dr. Arthur Lucas Northfield Health Centre, St. Heliers Road

8. Dr. Micahel Lovett
Dr. Ruth Lockie 108 Bunbury Road, Northfield

FIG. 70

APPENDIX 5

LIST OF BODIES APPROACHED FOR
FINANCIAL ASSISTANCE

LIST OF BODIES APPROACHED FOR FINANCIAL ASSISTANCE

The Aneurin Bevan Memorial Foundation

The Wellcome Trust

The Nuffield Foundation

The Garfield Weston Foundation

The Dowager Countess Eleanor Peel Trust

The Carnegie United Kingdom Trust

The Leverhulme Trust Fund

The Beaverbrook Foundation

The Nuffield Provincial Hospitals Trust

The Ciba Foundation

The Royal College of General Practitioners

The Medical Research Council

Department of Health and Social Security.

APPENDIX 6

HISTORICAL BACKGROUND OF THE CHARTERED
SOCIETY OF PHYSIOTHERAPY

HISTORICAL BACKGROUND OF CHARTERED SOCIETY OF PHYSIOTHERAPY

The Chartered Society of Physiotherapy is the oldest and largest organisation of physiotherapists in the United Kingdom and the second oldest in the world. Its training and examinations have been approved by the Minister of Health and the Secretary of State for Scotland as a qualification for employment as a physiotherapist in the National Health Service, those who obtain its qualification, after taking its training and examinations, are eligible for State Registration.

The Society was founded in 1894 by four young nurses, all fully trained in massage. Their names were Lucy Robinson, Rosalind Paget, Elizabeth Manley and Margaret Palmer.

At that time the profession of massage was in danger of falling into disrepute. There was a current craze for massage treatment, many brothels had sprung up, purporting to be nursing homes and the British Medical Journal warned its readers against the use of massage on account of the number of unscrupulous persons practising it.

The founders of the CSP decided that the good name of massage treatment should be restored, making massage "a safe, clean, and honourable profession for British women". On February, 1, 1895, a letter, published in Nursing Notes, announced the formation of the new society, and its intention of holding regular examinations and of awarding certificates to successful candidates. Now, for the first time, a basic standard of knowledge and competence was to be established.

The first official examinations of the Society of Trained Masseuses were held on February 23, 1895, when seven candidates were awarded the Society's certificate. Shortly afterwards, a circular was sent to hospitals, nursing homes and members of the medical profession, announcing the formation and intentions of the Society, and publishing its rules; no massage to be undertaken except under medical direction; no general massage for men (except in exceptional circumstances); no advertising except in professional papers; no sale of drugs to patients allowed. The high standard of professional conduct has been maintained. The Society grew rapidly in membership and became widely known in the nursing world. In February 1896, the first Annual General Meeting was held, at which it was decided to invite a select number of the medical profession to allow their names to be placed on the list of patrons. In 1900, when its membership had reached 250, the Society became the Incorporated Society of Trained Masseuses, acquiring the legal and public status of a professional organisation.

Up to 1905 the Society had been exclusively female, but in that year the War Office requested that it examine R.A.M.C. nursing orderlies in massage. It was agreed that male masseurs could be examined, provided, that, "only men of good character were allowed to train." It was still considered impossible for men to become members of the Society. The first examinations for men were held in September 1905 when all of the candidates were successful.

In 1910, the first examination in Swedish remedial exercises was held, followed the next year by an examination for teachers of the same subject. The war years, 1914-1918, saw an enormously increased demand for the services of trained masseuses, and the formation of the Almeric Paget

Corps, to work where-ever the War Office requested. In 1915 the first examination in medical electricity was held, and in 1916 the Society was honoured by the consent of Her Majesty the Queen to become Patron. During the war blind people were admitted to examination, and as these included many ex-army men, the whole question of male membership of the Society was reviewed, and by 1920 it was decided to admit men to membership. The first number of the Society's Journal was published in 1915, and a bronze badge was designed and issued to certificate holders. In 1920, the Society amalgamated with the Institute of Massage and Remedial Gymnastics and the Society was granted a Royal Charter. It went into liquidation and became the Chartered Society of Massage and Medical Gymnastics. Its membership was now approximately 5,000, and for the first time had as its chairman a member of the medical profession, Sir Cooper Perry, MA., MD., FRCP.

The C.S.M.M.G. continued to grow in strength and during the second world war physiotherapists gave service in military and civilian hospitals all over the world. In 1942 the Society decided to adopt its present name - The Chartered Society of Physiotherapy - as being more representative of the field of work it covers. When the National Health Service was formed in 1948, the C.S.P.'s training and examinations were approved as qualifications for working in the N.H.S.

The Professions Supplementary to Medicine Act 1960, makes it compulsory to be state registered to work as a physiotherapist in the National Health Service.

The Society has now over 20,000 members, its Journal has a circulation of 17,000 and is read in 90 other countries throughout the world.

The term "Domiciliary Physiotherapy", used in the title of this study requires qualification. Physiotherapy treatment has, with very few exceptions, been confined to the physiotherapy departments or the wards of hospitals.

In this environment, physiotherapists have been employed on surgical, medical, geriatric, paediatric wards and in the physiotherapy out-patient clinics. They have also been employed in the psychiatric and mental handicap hospitals.

Work in the above areas includes, pre and post-op exercises, rehabilitation at all stages, neurological treatments and treatment of chest disease. There are also areas of specialization such as the Intensive Care Unit, the stroke unit, young handicapped unit, burns unit, plastic surgery, orthopaedic surgery and coronary rehabilitation. Each of these areas will have a specialist physiotherapist. There are also physiotherapists working in gymnasia, special schools, sports injuries clinics, football, rugby and cricket clubs and with the national touring teams of all sports.

Physiotherapists are also employed in industry, large stores, veterinary practice, the Royal Ballet, on cruise liners and in health clinics. There are many engaged in private practice throughout the world. Finally, there are many engaged in teaching and a small number in research.

DOMICILIARY PHYSIOTHERAPY

This, by definition, is a physiotherapy service provided in the patient's own home.

It has been suggested, CSP Working Party (1974)(a), that community physiotherapy staff should have a minimum of two years experience. It is equally important that they should have had a variety of experience, and most important that they should have a personality which will allow them to cope with the challenge offered by domiciliary work, Frazer (1978)(d).

Because physiotherapy training does not include any instruction in the provision of domiciliary physiotherapy, staff involved in this service have been faced with an entirely new situation. Because this is a developing service, certain problems have been identified, Frazer (1979)(g), during the course of the present study and strategies have been adopted to enable the domiciliary physiotherapy staff to cope with most of them.

The physiotherapy staff, working with the project, share a total experience of twenty-four years and covers most of the specialties mentioned above. The three staff were given the Eysenk Personality Inventory, Eysenk (1969) , and all scored highly on the extraversion factor. All had previously worked for a number of years in the physiotherapy department at Selly Oak Hospital and had been selected for the domiciliary work because of their clinical skills but more important, their personalities.

One important requirement that must be met for domiciliary work, is the possession of a car and a clean driving licence. Although there are some domiciliary schemes operating by using public transport, this is not considered to be satisfactory. There are also schemes which treat patients within walking distance of the hospital with obvious limitations.

There has also been a trend towards the establishment of a community physiotherapy service, based on group medical practices, initiated by a sub-committee of the Standing Medical Advisory Council (1971). Such a service is not seen as other than a mini physiotherapy department which can only offer a service to those patients who can attend the clinic and cannot be described as a domiciliary physiotherapy service.

For a health district the size of the South Birmingham Health District, which is approximately eighty square miles, car ownership is essential. Unfortunately, such a pre-requisite eliminates many physiotherapists who would otherwise be eminently suitable for domiciliary work.

This is a major problem with regard to recruitment of suitable staff and it seems wrong that many physiotherapists should be denied the opportunity of working in the community simply because they cannot afford to run a car or do not possess a driving licence.

DEFINITION OF PHYSIOTHERAPY

A definition of physiotherapy, frequently quoted, is as follows; "Physiotherapy is the treatment of injury and diseases by physical means. It is used to help patients to regain and increase their physical abilities, to give them the opportunity to achieve their maximum potential in activities at home, work and leisure".

C.S.P. Curriculum (1978)(b).

Most definitions of physiotherapy contain variations of the above statement which does not do full justice to either the science or

the art involved in carrying out a successful physiotherapy treatment. One reason for the difficulty in obtaining a definite description of physiotherapy is the eclectic nature of the discipline. Another reason is the relative dearth of scientific evaluation of the various treatment procedures adopted.

Many physiotherapists treat patients using a wide variety of methods often empirically based, with marked success, but with no clear idea why one method proves superior to another.

The word physiotherapy is a greek hybrid, derived from physis, meaning nature and theurapeutike, meaning the art of healing. It is not surprising to discover that art is involved in the application of treatments used in physiotherapy, as the success of a remedial interaction often depends upon the way in which a treatment is carried out, rather than upon any specific method or equipment used.

Physiotherapy, like its name, is a hybrid combining both science and art, the two components being interwoven and difficult to separate, Frazer, (1975)(m).

A Chartered Society Working Party has produced a more comprehensive definition of a physiotherapist, Jenkins (1975) , which states; "The physiotherapist is a member of the rehabilitation team in which a physician or surgeon assumes primary clinical responsibility; assesses the patient and plans a programme of treatment in which advice to patients and relatives in the management of the condition plays an important part. The physiotherapist treats medical and traumatic disorders of the locomotor system (bones, joints, muscles);

neurological disorders; certain cardio-vascular and respiratory conditions; the pre and post-operative treatment of surgery of the thorax, abdomen and pelvis; the special problems of children including the mentally and physically handicapped, and the elderly; ante and post-natal training and certain skin conditions. By physical means teaching movement to individual and groups of patients with the aims of relaxing, mobilising, strengthening and improving co-ordination. The use of gymnastic apparatus and the therapeutic pool; encouraging and facilitating maximum function related to daily living and work; administering massage to soft tissues and the passive mobilization of joints, applying heat in the form of infra-red rays, short-wave diathermy and wax and hot packs and cold using ice; muscle stimulating currents, ultrasonics, ultra-violet rays.

Treatment is given in the wards and out-patient departments of general hospitals and special units, in community services with home visits and in special schools and in private clinics."

The above description is fairly comprehensive but is no more than a listing of the various procedures available and the areas in which they are carried out.

Although the teaching of various skills is mentioned, there is no indication that a sound knowledge of the behavioural sciences is required.

This appendix will elaborate upon the list of treatments above, itemising those used in the domiciliary physiotherapy service and explaining why they were chosen.

APPENDIX 7.

PHYSIOTHERAPY TREATMENTS USED IN THE STUDY

PHYSIOTHERAPY TREATMENTS USED IN THE STUDY

The list below includes all of the physiotherapy treatments used in the study of domiciliary physiotherapy. This list is divided into six categories:

1. Advice and management instructions (Common to all treatments).
2. Exercise, Massage, Manipulations and Mobilizations, Postural Drainage. (None of these treatments require equipment).
3. Heat and Cold (Produced by a variety of electrical means).
4. Ultrasonics, Interferential therapy, Low frequency currents. (Produced by specialized electrical equipment).
5. Intermittent Positive Pressure Breathing (Confined to chest conditions).
6. Traction (Used mainly in cases of neck and back pain).

There are a number of reasons why the above list of treatments was adopted for use in the community.

First, the equipment necessary is portable, second, the procedures have been shown to produce consistent results and third, the results obtained are common to both the physiotherapy department and the patients home.

Together with the equipment required for any of these procedures, the domiciliary physiotherapy service has a full range of items available such as, balls, springs, pulleys, walking aids, sticks and crutches; various measuring devices such as goniometers, peak-flow meters and dynamometers.

Portable ultra-violet lamps are available if required and short-wave diathermy machines can be transported to the patients home with the assistance of the physiotherapy department porter.

The community administrator and his stores provides a welcome back-up to the domiciliary physiotherapist. This store provides all of the aids, previously available from the Social Services and includes bath and toilet aids, wheelchairs, seat lifts, hoists, bed cradles, commodes and so on.

There is also a laundry service for the incontinent patient and a supply of incontinence garments is available.

The facilities to the patient in the community closely match those available in the hospital. There are a few items of equipment, such as parallel bars or lumbar traction facilities and here the physiotherapist must improvise. There is one example of a patient successfully receiving lumbar traction at home, using skin traction applied to one leg. Pulleys and weights were adapted to her bed, which was raised by two piles of house bricks which her husband had wrapped in brown paper. The patient spent ten days in bed on traction with excellent results..

Exercises

This is a general term which covers a wide variety of activity, and is possibly the major factor in the rehabilitation of the patient.

Most treatment programmes will include a scheme of progressive resistance exercises, whereby a patient, recovering from disease or injury involving atrophy or weakness of muscle, or loss of muscle control, is brought back to normal, or as near normal as circumstances will allow. There are several specialized methods associated with particular problems but the general principles of exercise therapy are as follows:

1. The patient must have explained to him, and fully understand, what is required of him.
2. Maximum relaxation of the antagonist muscle groups, prior to movement, is ensured by the selection of a good starting position.
3. The patient must be able to see and feel the movement. This involves the wearing of the minimum amount of clothing and, if necessary, the use of mirrors.
4. Frictional resistance can be removed by the use of smooth, powdered boards, or by the use of sling suspension.
5. The exercise should start, if possible, in the middle range where maximum leverage can be obtained.
6. The principle of leverage should be used by commencing the exercise with a short weight arm.
7. Gravity can be eliminated by the use of suitable supports, such as manual assistance from the therapist, by use of the powdered board or sling suspension. Gravity assisted exercises involves eccentric work for the antagonist muscle groups, while gravity may be introduced as a resistance, prior to the introduction of weights.

8. As the muscle gains strength, a logical and methodical progression is made. Muscle power can be assessed by the MRC grading as follows.

MRC Grading

MRC are the initial letters of the Medical Research Council and are used to describe a method of muscle strength grading, developed at Oxford.

0.	Nil	%	No contraction
1.	Flicker	10%	Flicker isolated to tendon.
2.	Weak	25%	Movement with gravity eliminated
3.	Fair	50%	Movement against gravity.
4.	Good	75%	As above, but with some resistance.
5.	Normal	100%	Normal

The above classification is useful in the early stages of treatment, but as progress is made, additional assessments are added, such as the weight that can be lifted, or the number of repetitions that can be performed. The latter can be recorded and used as a motivator for the patient. In general terms exercises can be given in the following progression.

Active assisted

Active free

Active resisted.

Active Assisted Exercises

These exercises are done with the assistance of springs, slings, pulleys or the hands of the physiotherapist. They are used when the MRC grade is 1 or 2.

Active Free Exercises

Usually introduced in MRC grade 2. Slings and powdered boards are used and a strong stimulus is provided when the patient sees he can produce a movement.



Plate 14

This patient was involved in a road traffic accident. The domiciliary physiotherapist is shown here walking the patient outside her home for the first time since the accident and helping to restore the patient's confidence.



Plate 15

This ninety year old lady was confined to her bed following a fall downstairs when she injured her shoulder. She also suffers from pernicious anaemia. Here she is using her shound arm to elevate the injured shoulder and maintain mobility.

Note the light switch above her head, the bucket by the bed which served as a commode, the oil stove which she used to heat soup, the toaster and the champagne bottles.

This patient didn't really want to get up as she could maintain a satisfactory existence within the bedroom.

Active Resisted Exercises

Introduced in MRC grade 3, and involves the use of varying degrees of resistance, including movement against gravity, slings, pulleys and weights.

Different methods are employed to obtain particular effects, such as hypertrophy, power, endurance and control, the method varying according to the case treated, but may include the following:

Heavy resistance exercise, Kabat or Frenkel exercises, the former involving the use of heavy weights in a progressively heavy lifting programme, the latter are used to gain control and can involve proprioceptive neuro-muscular facilitation techniques. Kabat, (1954)

In the case of patients involved in this study, most of whom have exercises as part of their treatment, PNF is used for the neurological conditions, while a modified form of HRE is adopted, using small weights.

Exercise can be carried out in any position, usually progressing from lying to sitting, to standing and involving an increasing range of movement. There are specialised exercises for balance, walking, moving around in transfer from bed to chair or commode. There are specific routines for patients with hip replacement or amputation. Irrespective of condition, the same general principles apply to all patients, once a treatment plan is prepared, the patient will progress through a carefully controlled scheme of exercises which can include some or all of those described above.

Massage

Massage is rarely used as a treatment in itself, but can often be a useful addition to a treatment programme, especially in the case of the elderly patient.

It is a form of treatment which is suited to domiciliary work as no equipment is required. There are three types of massage which have been used in the study, mechanical, manual and connective tissue massage, the latter being a specialised method of manual massage.

Mechanical massage

This form of massage is sometimes given using a hand held Niagra cyclo-massage unit which transmits vibrations to the patient's tissues, the depth and speed of the vibration being controlled by the operator. This method is useful in conditions such as oedema, where considerable manual effort would be required to produce an effect.

Manual Massage

There are a wide variety of techniques available, the most commonly used are effleurage, petrissage, kneading and frictions.

Effleurage

This is given with a firm but relaxed hand, using the palmar aspect, the line of massage is adapted to whatever part of the body is treated. It is usual to work inwards from the periphery, as this form of massage is used to assist the venous and lymphatic drainage of a limb, as well as for its sedative effect.

Petrissage

This is applied with the relaxed palm, incorporating an alternate pressure pick-up, squeeze, relax routine. A steady rhythm is maintained which, together with the avoidance of pinching the tissues, will give complete relaxation.

Kneading

This is applied using either the finger pads or the thumb pads for small areas and the palms of the hands for the larger areas of the body. The method includes alternate pressure and relaxation and is a useful technique for mobilising the tissues. The physiotherapist uses her body weight applied to the patient's tissues through a straight arm via a relaxed palm.

Frictions

These are applied to a carefully located area of the tissues, the operators finger tip being used to exert considerable pressure via the pad of the finger. The finger is moved across the underlying tissues with skin contact being maintained during treatment.

It is a lengthy process and because of the pressure, it can be painful for the patient. It is used mainly to mobilize scar tissue, although its inventor, Cyriax, (1960) , indicates many uses, this technique is used as a last resort in this study, because of the discomfort it can cause.

Connective Tissue Massage

This is a specialized massage technique, which for many years has



Plate 16

This patient with an osteo-arthritic knee is being treated by connective tissue massage.

been taught by Miss M. Ebner, (1962) . The patient is usually treated in the sitting position and the massage is applied by the operator, using a relaxed hand, held in ulnar deviation and placing the finger-tips of the second and third fingers on the patient's skin at an angle of between 40 and 60 degrees. The metacarpo-phalangeal joints are slightly flexed. The slack in the patient's skin is lightly taken up and the finger-tips are drawn along the area chosen for treatment. There are two types of strokes used, long and short. The short is a short twisting movement while the long stroke can involve the moving of the fingers around the periphery of the scapula or along the border of the spinal column. The short stroke produces fewer side effects than the long stroke and the sensation experienced by the patient varies from a slight scratching to a feeling of red-hot needles.

Hyperaemia is induced and a sensation of heat produced which can last for several hours. This type of massage is remarkably effective in relieving pain, in certain cases its effect is equal to that produced by epidural injection and is superior to pethidine in relieving pain, Frazer (1978)(e).

This treatment is effective and is quick to apply, it requires no equipment and has no harmful side effects.

Manipulations and Mobilizations

Pain and impaired movement, with loss of function of joints, is quite common and can occur in the absence of extrinsic trauma, or even with relatively minor pathological changes, such as those of early osteo-arthritis.

Joint manipulation is concerned with the relief of pain in, and restoration of function to synovial joints. In order to be able to perform joint mobilization or manipulation effectively, considerable anatomical knowledge is required of the physiotherapist, Grieve, (1971) . With human joints there is a degree of play between the moving parts which, if absent, will lead to a loss of function, Mennell, (1949) . It is a movement which cannot be restored by muscular action and requires the intervention of a manipulative procedure to restore normal function. A manipulation is applied to an individual joint, but not to a collection of joints as any joint manipulation must be local to the affected joint. It is usually carried out by stabilising one aspect of the joint and mobilising the other aspect. The full movement is achieved, not by force, but by momentum, with the movement being carefully controlled. Manipulations range in force from the gentle mobilization to the full manipulation of a major joint such as the sacro-iliac joint, which requires considerable pressure to manipulate. Such pressure is carefully controlled and is carried out within the normal range for such a joint.

Manipulation of the spine is a most dramatic treatment, if successful, as a patient can be transformed from a pain wracked cripple to a normal human being in seconds. It is a treatment, moreover, where the result is immediately apparent and can easily be measured.

Before any therapeutic manipulation is attempted, it is essential to know the normal ranges of movement for all joints, including the spine. Prior to any manipulation it is prudent to carry out a full assessment of the patient including x-ray examination.

In the case of the elderly patient it is possible that various pathological states are present which would contraindicate certain

manipulations. Congestive cardiac failure, secondary carcinoma, T.B Pagets disease and rheumatoid arthritis are all examples of these.

Postural Drainage

The object of this treatment is to clear the chest of secretions, using gravity to assist the process. The procedure is usually accompanied by percussion and breathing exercises.

The treatment is given by placing the patient in certain positions, in order to drain various sections of the lungs, the majority of positions involve the patient lying with his head below the level of his feet. The upper lobes of the lungs are drained with the patient sitting and the other positions may require to be modified for the elderly patient who cannot tolerate the head down position. It is quite easy to trigger off a cardiac arrest and for the elderly patient postural drainage may simply involve turning from side to side without actually placing the head below foot level.

Heat and Cold

These methods of treatment are used to produce pain relief, increase circulation and promote relaxation, Scott (1958) . They are usually applied prior to commencing active exercise. Ice and heat packs are convenient for domiciliary work as they are easily transported. Paraffin wax is used in cases such as rheumatoid arthritis or fracture of the hand and wrist. The wax transmits heat to awkwardly shaped areas and has a softening effect on the skin. Heat, however produced, has long been used as a therapeutic agent, but in physiotherapy, heat is rarely used alone, often being the precursor to active exercise. Small heat lamps are available for domiciliary work.

Ultrasound

This has been in use for just over twenty years and the therapeutic effects provide a useful physiotherapy treatment.

These effects include, the reduction of pain, local tissue heating, the stimulation of local cell activity and hence tissue regeneration, and the production of hyperaemia, Patrick (1964)(a). It is produced by applying a sinusoidal voltage across a flat circular disc of ceramic, which expands and contracts following the polarity of the voltage. The pressure wave so produced is transmitted from the transducer head to the tissues via a medium such as oil or a thixotropic substance.

The ultrasonic beam is absorbed in the tissues to a depth dependent upon the absorption coefficient of the tissue. Most soft tissues have similar absorption coefficients, although that for muscle is slightly higher than for other tissues, Ter Haar. (1978).

Ultrasonics is used mainly in lesions affecting the soft tissues, such as sprains, contusions and injuries accompanying fractures.

It is often used in conjunction with ice as these two treatments are complementary and are markedly effective in resolving the post-traumatic inflammatory state, Patrick (1978)(b). The treatment is quick to apply, lasting no longer than five minutes, the equipment is light and portable and the treatment is pain free for the patient.

Ultrasound is described as useful in the treatment of soft tissue trauma, some osteo-arthritic conditions and varicose ulcers, Dyson and Suckling (1978).

There are a number of potentially dangerous side effects, such as stasis in vessels under the area treated and there can also be transient damage to the endothelial lumen. To avoid this care has to be taken in choosing the angle of application as well as the amount of movement during treatment. There is the possibility that endothelial damage may produce thrombus formation and the operator must always be alert to such dangers, Dyson (1973) .

Interferential Therapy

This is a relatively recent introduction to the National Health Service, although it has been widely used in sports and football clubs since the late fifties. During the course of the present study, results obtained in the treatment of osteo-arthritis joints have demonstrated the value of this treatment. These observations support the findings of a Bulgarian study which demonstrated that interferential therapy was the most effective treatment for osteo-arthritis, Nikolowa-Troeva (1967) .

The current produced is a low frequency current of 0 to 100 cycles per second and involves the application of two currents of different frequency, simultaneously to the body. One current is fixed at 4,000 cycles per second, while the other can be varied from 3,900 to 4,000 cycles per second. McQuire (1975) , claims that the normal skin resistance to the therapeutic current is 3,200 ohms per 100 cm² and the resistance of the skin to the interferential current is only 41.6 ohms per 100 cm² and that the interferential current is therefore much more comfortable to the patient. It is more probable that the high frequency of this current is such as to exceed the refractive capacity of the sensory nerves and therefore the patient cannot experience discomfort.



Plate 17

The portable interferential machine is used here to treat a patient with osteo-arthritic joints.

Two portable interferential machines are available for the domiciliary patients.

Low Frequency Currents

The most frequently used current of this type is the current produced by a small battery operated box which gives a current of one millisecond or less. This current will stimulate innervated muscle and the treatment is used mainly in re-education of muscle following injury. It can also be used to re-educate the muscles of the pelvic floor in case of incontinence.

Intermittent Positive Pressure Breathing

This is a treatment used with patients suffering from sputum retention, who are unable to inhale sufficient air to enable them to cough effectively. The air is delivered to the patient's lungs by a portable machine which contains its own air pump and is powered by electricity. The air delivery is triggered by the patient's own inspiratory effort and the air is delivered to their lungs via a co-axial tubing at a pressure which can be pre-determined by the physiotherapist. The air is humidified, using distilled water and this helps to loosen tenacious sputum, which can then be coughed up more easily. The machine can also deliver various broncho-dilators instead of the distilled water and is an effective and convenient way of increasing the patient's expiratory effort. The reduction of stickiness of the secretions lessens the distress of coughing. The treatment is useful in most chronic chest conditions and has been used in the study with patients suffering from chronic bronchitis and with several cases of carcinoma of the lung.

The treatment is usually accompanied by postural drainage and percussion with breathing exercises and has been found to be effective in reducing respiratory distress in selected patients suffering from chronic chest conditions, Rowse (1976) .

Traction

Hippocrates described traction in his writings, Adams (1859) , and it is a treatment which has stood the test of time, still producing improvements in patients. Traction is usually accompanied by heat or ultrasonics, with exercises as part of an overall treatment plan. Traction involves stretching the patient's body, usually the spine, in order to effect a separation of the joint surfaces.

The Physiotherapists Status

A recent publication by the Department of Health and Social Security, DHSS (1977) , brought about a significant change in the status of physiotherapy. A statement by the Standing Medical Advisory Committee included two general comments as follows:

1. The patient is referred to a doctor for the particular illness and it is the doctor who arranges for the patient to have therapy. This is true whether the referring doctor is a consultant or a general practitioner. The Committee therefore feel that it should be spelled out that the patient is the responsibility of the doctor and in referring the patient for therapy he is not handing over his overall control of the patient.
2. In asking for treatment by a therapist the doctor is clearly asking for the help of another trained professional, and the profession of medicine and the various therapies differ. It follows from

this that the therapist has a duty and a consequential right to decline to perform any therapy which his professional training and expertise suggest is actively harmful to the patient. Equally the doctor who is responsible for the patient has the right to instruct the therapist not to carry out certain forms of treatment which he believes harmful to the patient.

The statement by the Standing Medical Advisory Committee included the following recommendations:

- (a) In referring patients to therapists, doctors should give the diagnosis where possible, and set out the aims of treatment with a note of limitations and contra-indications to a particular form of treatment if any. They should normally say when they will see the patient again. Within this framework therapists may decide upon the nature of the treatment if this has not been agreed with the doctors previously. They should also be expected to advise curtailment or prolongation of the treatment if they consider this to be necessary.
- (b) Patients progress should be reviewed regularly, with both doctor and therapists present whenever possible. Where the therapists absence is unavoidable, their reports should be available and the findings of the review should be notified to them.
- (c) On occasions it may become apparent to the therapist that inappropriate treatment is being given. The therapist should discontinue the therapy and discuss with the doctor the needs of the patient in the light of altered circumstances.
- (d) It is essential that the therapist should have direct access to the consultant or general practitioner clinically responsible for the patient.

The same document states that it should be recognised that not all therapists are experienced, or even necessarily trained, in every facet of

the work they may be called to do and emphasises that, where necessary professional supervision should be provided by a more senior therapist with the appropriate knowledge or experience.

The increase in responsibility and consequent improvement in status implicit in these recommendations have come at an opportune time for the domiciliary physiotherapy service. The nature of the work and the wide range of conditions referred require a broad experience and this statement by the Standing Medical Advisory Committee is welcomed as a sign that the physiotherapist is at last recognised as a competent professional, capable of making decisions which will enable them to play a wider role in the rehabilitation of the patient.

APPENDIX 8

STROKE CARE IN THE HOME

Stroke Care in the Home

Varicus studies,¹²³ have demonstrated that the ratio of stroke patients treated at home as opposed to being admitted to hospital is roughly 3:2. It has been suggested by Brocklehurst (1978)⁴, that social factors are the most significant elements influencing the doctor in his decision to treat the stroke patient at home. It has been claimed, however, that many doctors lose interest in the stroke patient once the acute phase of the illness has passed and that most patients in the community receive very little, if any, long-term rehabilitation, Mulley (1978)⁵. The provision of domiciliary care is described by Opit (1977)⁶, as expensive in time, money and personnel. That this not need be the case has been clearly demonstrated within the South Birmingham Health District where a three year study, Frazer (1979)⁷, has shown that domiciliary physiotherapy is both cost effective and achieves results which compare favourably with the hospital based rehabilitation service. Table 1 shows the proportion of stroke patients treated in a sample of 500 patients, by the domiciliary physiotherapy service.

There are a number of approaches to the treatment of the stroke patient, each with their enthusiastic advocates; the following chapter borrows aspects of different techniques which are usually selected empirically and tailored to fit the needs of the individual patient and his family. The methods used are broadly similar to those employed within the hospital and the treatment outlined in the chapter on hemiplegia (P.) can be applied in the case of the domiciliary stroke patient. Within the home there are not the same comprehensive facilities available in the hospital and this factor along with problems of space, equipment, old and infirm relatives and unsuitable beds all create special challenges for the domiciliary physiotherapist when treating the stroke patient at home.

TABLE 54 : Main Diagnosis by Age Group

CONDITION	0-64	65-69	70-74	75-79	80-84	85-89	90+	
Rheumatoid Arthritis	5	7	5	4	7	1		29
Osteo Arthritis	3	2	24	22	30	9	4	94
Cervical Spondylitis	-	-	-	2	2	-	1	5
Frozen Shoulder	-	-	1	-	2	1	1	5
Low Back Pain	-	3	2	1	1	2	1	10
Other Pain	-	-	4	1	3	3	3	14
C.V.A.	19	31	33	39	23	11	4	160
Parkinsons	-	2	4	3	-	-	-	9
Disseminated Sclerosis	6	3	1	-	-	-	-	10
Other C.N.S.	7	5	1	2	-	1	1	17
Circulatory	1	2	-	2	2	1	2	10
Bronchitis	1	4	5	3	2	-	1	16
Respiratory	2	2	3	-	-	-	-	7
Fractured Femur	1	3	5	2	5	6	1	23
Other Fractures	1	-	3	4	5	1	1	15
Hip Operations	-	1	1	1	-	1	-	4
Other Orthopaedic	3	1	-	3	7	2	4	20
Amputee	1	-	1	1	-	-	-	3
Other Diseases	6	7	6	9	10	11	-	49
TOTAL	56	73	99	99	99	50	24	500

Treatment Plan

Before commencing treatment it is essential that a treatment plan is prepared which will involve a detailed assessment of the patient which will include physical dependency, communication problems, mental state, social background and medical diagnosis.

The initial record can be based on a number of different functional tests which are available. No particular system of recording is wholly satisfactory and there is no general acceptance among physiotherapists as to which system is most suitable. The ideal system needs to be easy to complete, simple, and reproducible by different physiotherapists on the same patient. The importance of accurate recording cannot be overstated as it will form the basis for any future research activity into the rehabilitation of the stroke patient.

As well as this initial assessment, there should be a continuous monitoring of progress, preferably by an independent physiotherapist, in order to obtain an unbiased assessment of the patients achievement.

Problems Associated with Stroke

These are outlined in the preceding chapters and exactly the same problems of hypotonia, spasticity, loss or disturbance of proprioception, perceptual and communication difficulties, visual and psychological problems, present in the domiciliary stroke patient, and in common with the hospital patient, many stroke victims suffer one or more of these problems in addition to the loss of motor function.

Although certain of these problems are regarded as the province or other specialities, the community physiotherapist needs to be capable of recognising all of the patient's problems and to be capable of providing basic advice and instruction on all of them.

Problems Associated with Domiciliary Treatment

These can be considered under a number of headings which are not listed in any order of importance as the circumstances may alter from patient to patient: psychological, social, environment, equipment, communication, diagnosis, supporting services.

Psychological Problems

It is well recognised that a bond between patient and physiotherapist is created, possibly because of the nature of the treatment of the stroke patient which involves close physical contact, and physiotherapists should be aware of the possibility that transference may occur at some stage of the treatment course. Transference is a term used to describe the development of an emotional attitude in a patient towards a therapist. It is not unusual for a patient to experience powerful feelings of love, hate and so on with regard to the physiotherapist. The patient may also have certain fantasies about the physiotherapist and it is important that she is able to appreciate that such events are a normal consequence of many therapeutic relationships.

Apart from the psychological problems experienced by some stroke patients, there are also psychological problems for the physiotherapist when faced with a large contingent of such patients in the community. The work is usually heavy and demanding both in terms of time and effort, with the likelihood of emotional demands on the physiotherapist which are on occasions more exhausting than their physical counterparts.

The fact that the majority of the stroke patients are aged sixty-five and above, Table 1, adds additional stress as many patients of this age are suffering from more than one pathological condition or present with a serious social problem unconnected with their stroke.

As the domiciliary physiotherapist is working in comparative isolation, it is probable that she is faced by more difficulties and the need to accept more responsibility for her patient. It is not unusual for her to have to decide whether a patient should be admitted to hospital and then to make the appropriate arrangements with all the telephoning and discussions that such a move might entail. Another major source of stress is the need to maintain and run a car together with all the problems associated with driving and parking in busy city traffic.

Social Problems

In the hospital the patient is a part of a process which ensures that patients are fairly strongly regimented with regard to their treatment. If a physiotherapist instructs the ward staff to position him in a certain way these instructions will usually be implemented whether the patient agrees or not. In the home the roles are reversed with the physiotherapist a guest, and if the patient does not wish to comply with her treatment procedures, he will refuse. It is doubly important that the domiciliary physiotherapist should gain the confidence and co-operation of her patient and his family as early as possible in the treatment course.

The physiotherapist is teaching the family certain exercises and routines and must rely on her own judgement regarding the extent of the families involvement as they are acting as unpaid helpers who are providing care between visits. It is not unusual for the physiotherapist to be seen as part of the family in such a situation and the physiotherapist should retain her professional demeanour in order that role boundaries do not become unclear.



Plate 18

This is a six year old girl with hemiplegia having her affected arm and hand passively mobilised.

In dealing with any patient a friendly reserve should be adopted and it should be remembered that the dividing line between normal professional concern and friendship is easily misread. Making friends with a patient can lead to worry or even guilt and it is important to remember that some patients will misinterpret sympathy or similar attitudes, leading him to develop unrealistic expectations about the clinical interaction. In this context 'friend' is taken to mean a person with whom a mutual need satisfaction can be realised. It is reasonable for the physiotherapist to express hopes, values and so on and give support to the patient but she should not use the clinical interaction to support or satisfy her own needs or anxieties.

Problems with the Environment

The treatment of the stroke patient will normally require very little equipment. The main item of equipment missing in the home is a set of parallel bars and a high mat. It is often difficult if not impossible to get an elderly stroke victim down onto the floor and the appropriate treatment will be given while the patient is on his bed. Tables or chairs can sometimes be substitutes for the parallel bars unless there is a family handyman who can easily construct such an item with suitable lengths of scaffolding. Full length mirrors are not always available in the home but lengths of mirror which can be screwed to the wall can be obtained at certain discount stores such as Val Products, for a few pounds, and are well worth the investment.

With an efficient community stores there should not be any problems with aids such as chairs, commodes, bath seats, transfer boards and so on and time spent in developing a good relationship with the clerical staff in this store is well rewarded.

Communication Problems

As the physiotherapist is working single-handed within the community it is probable that she will experience problems arising from extended or non-existent lines of communication. To establish lines of communication is hard work and can be initially very time-consuming. These lines of communication are well established within the hospital but are virtually unknown within the community. The G.P., District Nurse and Health Visitor may have an established communication procedure but the physiotherapist can often find herself having to contact these individuals separately which can prove both difficult and frustrating. Messages left with a third party are rarely delivered correctly and the domiciliary physiotherapist has no option other than to spend several months on establishing effective lines of communication with her colleagues in the community.

Diagnosis

Normally the diagnosis which the domiciliary physiotherapist receives is superior to that provided for the hospital physiotherapist. There are exceptions and it is sometimes difficult to contact the doctor on the day when he is needed. The establishment of group practices adds to this problem as some doctors may work only on certain days in the practice and cannot be contacted.

An additional task increasingly allotted to the domiciliary physiotherapist is the request from a consultant for her opinion whether the patient requires hospital admission for rehabilitation. She can also be asked whether she feels the patient requires surgery. This type of work is an example of the role extension possible within the community and adds greatly to the challenge presented by this type of work.

Supporting Services

The physiotherapist is often the first person to recognise a particular need in a family and she is faced with the problem of arranging for certain supporting services for the patient and his family. In areas where there is no community occupational therapist the physiotherapist may request for certain alterations to be made within the home. Invariably there will be a delay before a 'rehabilitation officer' calls from the city Social Service department with an even longer delay before the alteration is made. This is an area of responsibility which must be extended to the domiciliary physiotherapist who is trained to recognise such a need and, more important, is probably one of the first experts to visit the patient. The expensive duplication of visits by another person should be investigated as a matter of urgency.

Suggested Solutions

All of the above problems can be alleviated if not prevented provided a number of basic steps are taken at the commencement of treatment. The preparation of the treatment plan, following the initial visit, will be based on the Problem Oriented Assessment approach. This will allow the various problems to be listed in order of importance and enable the physiotherapist to define her role with regard to each separate problem. In this way the total problem presented by any patient can be broken down into separate tasks, some of which are the province of other specialities, and this will prevent the physiotherapist from attempting to do too much for any patient. The domiciliary physiotherapist will often be faced with a 'problem patient' who is excessively demanding or difficult. It is probable that the same patient is just as much a problem for the doctor

or the district nurse as he is for the physiotherapist.

The sense of isolation, sometimes experienced by the domiciliary physiotherapist can be countered by regular attendance at the weekly ward meetings and by regular visits to the GP practices. Many GP's meet at intervals to hold clinical discussions and these meetings are often supported by drug companies. Such meetings are worth attending, not only for the opportunity to meet the doctors but also for the quality of the luncheon provided. The combination of business with pleasure can be recommended as the social atmosphere encourages a good working relationship between the disciplines. Many GP's welcome the physiotherapists call at the surgery and are willing to discuss the patient and compare notes.

It is recommended that the domiciliary physiotherapist participates in the hospital on-call and weekend rotas as this ensures frequent contact with her hospital colleagues as well as keeping her up-to-date with certain techniques. The domiciliary physiotherapist will be asked to visit luncheon and stroke clubs and such invitations should be accepted as they are a logical extension of her role in the community. She can enter a discussion about the physical problems of the patients and often performs a useful preventative role in this environment.

The local press and radio can readily be involved in the instruction of the local population in various aspects of health care and often welcome ideas for programmes on such subjects.

As there is evidence to suggest that the domiciliary treatment of the stroke patient is cost effective, Frazer (1979)⁸, it would seem reasonable that the burden of car ownership and maintenance faced by the domiciliary physiotherapist might be eased by the provision of interest-free loans or alternatively by the provision of some form of

sponsored transport within the community. The social problems mentioned above require the physiotherapist to be adept at dealing with various social and ethnic groups. It is advisable that the domiciliary physiotherapist should have at least three years experience since gaining her qualification, in order that she should have dealt with a wider range of people and conditions. Most university extra mural departments organize courses on social behaviour or various aspects of sociology. It is recommended that aspiring domiciliary physiotherapists attend such classes, the fees being refunded from the training budget.

The environmental problems are usually fairly easily solved. The majority of old people have floors which are covered in rugs and carpets, laid one on top of the other, with a view to saving wear on the item underneath. Considerable tact is required when removing these obstacles and it is often the case that they will be replaced immediately upon the departure from the house of the physiotherapist. When the patient is beginning walking practice, the carpet can present a difficult surface. This can be overcome by laying a piece of plastic carpet protector over the carpet. This can be bought in appropriate lengths from most carpet shops at a reasonable price.

The patient's bed may be transferred downstairs and if no relatives are available the department porter is invaluable. A commode will be required in the early stages of recovery and a supply of disposable sheets and incontinence pads may be required. Kanga pants and the Kylie sheet may be used during this period and can be obtained from the community stores.

The family with a competent do-it-yourself individual can avoid the long delays in having alterations to the home. Provided the physiotherapist can give advice and instructions, many families can do their own alterations.

The height of the bed can easily be altered, either by using bed blocks or by having the legs sawn off. The occupational therapy department is a useful ally in this instance. The too soft mattress can be transformed by the use of a sheet of half-inch plywood of the appropriate size. If this should prove too expensive for the patient an old door can be picked up for £1.00 at many second-hand timber shops.

If the family have insufficient pillows, paper pillow cases can be used to cover cushions or can be filled with foam off-cuts, costing about £1.00 for a pillow sized piece in the market. While it is not suggested that the domiciliary physiotherapist spends her time scrambling around junk yards, it is sometimes the case that she is the only person available and it is a measure of her resourcefulness that such tasks get completed.

The remaining problems mentioned above can all be avoided by the establishing of effective communication and it is essential that this is carried out as a separate exercise before any domiciliary service is commenced. When the service is established it is important to remember that good communication demands constant effort which can be at times vexing and time-consuming, particularly when certain individuals resent what they see as an intrusion into their territory.

Physiotherapy Treatment of the Stroke Patient

The routine which is adopted for the patient nursed at home is broadly similar to that used in hospital. The extension of physiotherapy treatment into the community has enabled many stroke patients to be kept at home and there is evidence to suggest that patients receiving their rehabilitation at home recover equally well as those treated in the hospital.

In hospitals which do not have a stroke unit, there can be differences of expertise within the different wards and it is sometimes difficult to engage the co-operation equally of all ward staff. In this respect the domiciliary stroke patient is at an advantage as the provision of care is directed and monitored by the domiciliary physiotherapist.

Early Stages

Treatment will begin as soon as possible following the stroke and will include positioning, passive movements and care of the chest. The domiciliary physiotherapist will have access to IPPB machines, ultrasonic nebulizers and chest suction equipment. She can also arrange the supply of a tipping frame if required. It is possible for her to visit the patient frequently during the early stages of recovery if there is a chest infection present.

A full range of passive movements will be given each day and the relatives will be instructed in these routines. Positioning will be taught and it is helpful to fix diagrams or pictures of the correct positioning above the patient's bed. Relatives are usually most anxious to be of assistance at this stage of rehabilitation and time spent in careful teaching is well rewarded.

Positioning

Co-operation between the physiotherapist and the district nurse is essential in order to ensure that the patient is placed in the correct position following routine nursing procedures. It is also important that the relatives receive consistent advice from both professions as there is nothing so detrimental as conflicting instructions to the relatives.

It is usual for the district nursing officer to arrange study days when the domiciliary physiotherapist attends and demonstrates such techniques as positioning, bridging and handling the stroke patient. It is essential that the nurse and the relatives are shown how to lift the patient up and down and in and out of the bed. It must be repeatedly stressed that they should not support him underneath his affected arm as this can lead to the painful shoulder commonly found in the stroke patient. Provided the nurse, physiotherapist and family work closely together, it is possible to give a consistent service to the patient in the home.

Bridging

This simple procedure, which is taught to the patient and to his relatives from the earliest possible time following his stroke, makes it much easier to manage the patient in bed and facilitates such nursing procedures as sheet changing, care of pressure areas and use of the bed-pan.

Rolling

The ability to turn over in bed independently provides considerable stimulus to the patient and will contribute to an improvement in his morale. When it is appreciated that many stroke victims suffer depression following the stroke, which is often linked with the inability to move independently, it can be seen that any independent movement will be important to the patient.

These two exercises can be easily taught to the relatives and their use will make nursing considerably easier in the early stages of recovery.

Exercise routine

The programme of exercise will closely follow those outlined in the previous chapter although there may be occasional modifications depending upon the time available to the physiotherapist. Many of the procedures can be broken down into sections and then taught to the relative, for example re-education of balance can be taught in rotation starting with head control and progressing to the other elements described. It is possible for most relatives to cope with this 'sectionalised' approach and it ensures that the patient will be given a continuous and consistent treatment, even if it should be spread over a longer period with less professional input.

The programme of exercises assumes a bilateral approach to the restoration of function which constantly reinforces the awareness of the affected side. In cases in the community where the patient is either too old or frail or his relative is incapable of co-operating in the rehabilitation, the method adopted may have to concentrate on making the patient mobile by using the support of a walking aid, perhaps utilizing some form of knee brace, such as the Swedish Knee cage, or an ankle support, as a last resort.

The resulting pattern of walking is cumbersome and effectively prevents a return to independence as the patient can never carry anything or manipulate any utensil while standing. There may be occasions when the use of a below knee leg iron is justified, especially in cases where the patient is unaware that the ankle is inverted and suffering repeated minor trauma.

Walking

When the patient has achieved reasonable standing balance and even before he has mastered the ability to swing his affected leg,



Plate 19

Here a stroke patient is having proprioceptive neuromuscular facilitation exercise to his affected arm.

walking can be attempted. The timing of this event will depend upon a number of factors including the morale of the patient and his family, his walking pattern and the space available within the home. The re-education of walking will be along the lines of that described in the preceding chapter.

Advice

It is recognised that the patient and his relatives will seek advice from the physiotherapist at all stages of his recovery. It is probable that the domiciliary physiotherapist is the person with whom the patient most readily relates and from whom advice most often will be sought. The advice which the physiotherapist is expected to provide is wide-ranging and she should beware of offering advice which is contradictory to that of the other professionals calling on the patient.

As far as advice on physical exercise is concerned it is probable that the physiotherapist is the person most suitable to provide it. In the cases where advice on medication, social or psychological matters is required, the doctor or the social worker can be approached by the physiotherapist and asked for their opinions. It has been found that the patient is more likely to talk with the physiotherapist than most other professionals, possibly because of the special bond which develops during the course of the treatment. A delicate area is that of sexual activity. There have been a number of instances where a stroke patient has developed a second stroke following such activity. Physiotherapists are often asked for their advice on whether such normal pursuits should be attempted. The fact that the patient should ask for advice of this nature suggests that he should be encouraged to follow his desires as the object of our treatment is the restoration of function where possible. It is helpful to be

reminded that doctors, when faced with similar questions, are no more experienced than most physiotherapists!

Factors which influence recovery

Patients who recover their muscle function within the first two or three weeks can be considered to have a good prognosis for rehabilitation. Neurological recovery is thought to begin at some point between the first and seventh week following the onset of the stroke, with little further neurological improvement following the fourteenth week. Functional recovery is closely linked with neurological recovery, Newman (1972)⁹. This author has suggested that much of the early recovery, including that of the upper limb, may be due to the restoration of circulation to ischaemic areas of the brain, with late recovery attributable to the transfer of function to undamaged neurones. Research into the recovery of arm movement at Frenchay Hospital, Bristol, in co-operation with the University, is currently underway. One finding suggests that improvement can occur in performance, two years after the stroke, Langton Hewer (1979)¹⁰. Factors which militate against recovery include severe spasticity, loss of sensation, mental confusion with inability to co-operate with the rehabilitation exercises.

The attitude of the relatives within the home is most important. Patients with many of the problems listed above can be maintained at home provided there is good family support. Such families in turn will require long-term support from the domiciliary physiotherapist and it is common practice to keep such patients on the list of regular visits for periods of three or more years. There may not be any physical improvement in such cases but the weekly or fortnightly visit

by the physiotherapist has been shown to be a significant factor in keeping the seriously impaired stroke patient at home. Any claim that the recovery of the stroke patient can be attributed mainly to circulatory and neurological factors can be questioned by examining a stroke patient who has been neglected for some reason. His limbs will be fixed in abnormal positions, contractures, bedsores and incontinence will complete the picture and will all contribute to a severe nursing problem. The psychological state of the patient is an important factor in recovery and the sudden change in physical circumstances will, depending on his personality type, lead to depression or anxiety. The patient will worry about his future, especially with regard to his work and finances, and married patients may be concerned about a possible loss of attractiveness where their partner is concerned. All of these worries will depend upon the ability of the patient to be aware of his condition and are absent in a patient suffering from anosognosia. When these worries are superimposed upon either a speech defect or a perceptual difficulty, the physiotherapist requires to be capable of constant patience and to be able to give continual reassurance.

Most physiotherapists will have had experience of a stroke patient who has been excessively agitated or who has struck out at them. These patients are depressed and it should be remembered that this depression is quite natural and should improve within a few months when the patient adjusts to his changed condition. The best therapy for this feature is improvement and any change for the better, no matter how minimal, must be highlighted by profuse praise and encouragement. There can also be a loss of self-esteem with a refusal to accept a changed body image, sometimes to the extent that the patient will deny that there is anything wrong with him. This state of mind is a

serious impediment to progress and the use of portable video equipment may help the patient to adjust his self concept.

The economic, social and emotional effects experienced by the family as a result of stroke may be expressed in feelings of helplessness and frustration, often projected onto the physiotherapist in the form of criticism or by excessive demands for additional treatment. To counter this the family should be involved in all stages of the rehabilitation and should be encouraged to express their fears and anxieties. The family should also be prepared for the eventual termination of physiotherapy treatment and this process should commence from the first visit. The mixing with other similarly afflicted patients which is possible within the hospital ward is denied to the domiciliary stroke patient. Such mixing in the ward encourages social skills and will facilitate interaction among the patients. In the case of the stroke victim who remains at home, the physiotherapist will have to ensure that this element of rehabilitation is not overlooked and she may have to instruct the family in the method. The tendency for the family to be protective and over indulgent to the patient will have to be prevented.

All recovery is ultimately dependent upon the underlying pathology, nevertheless it is evident that the sooner treatment begins the better is likely to be the outcome. The age of the patient is not significant although it has been claimed that the younger patient will have a stronger motivation to get better. Elderly patients are as likely to respond to treatment as well as younger ones.

Severe spasticity, if present, may be helped by drugs or by various surgical procedures, while muscle weakness is sometimes treated by electrical stimulators, such as the peroneal stimulator used in cases of drop-foot. The painful shoulder, common to many

stroke patients, is a constant problem for the domiciliary physiotherapist. She can treat it with positioning, ice, heat, interferential or ultrasonics. Connective tissue massage is useful in domiciliary treatment, while support from slings or the use of figure of eight bandages may provide some relief.

Discharge from Physiotherapy Treatment

There are certain guidelines governing the discharge from treatment of the stroke patient, and these include:

1. Pressure of new referrals
2. Wishes of the patient and his family
3. Level of progress
4. Availability of follow-up services
5. Lack of further improvement

For physiotherapists, the lack of progress is likely to be the point at which discharge from treatment is considered. It should be remembered that the idea of 'discharge' is stressful for the patient and his family may respond by demanding further treatment, convinced that improvement will occur. Emotional language, is often employed: 'left to rot', 'thrown out' commonly being used to express the fear felt at such a time. Because the domiciliary physiotherapist is often required to face this situation alone, she can experience acute discomfort and personal feelings of guilt. In order to avoid such problems, it is essential that the family is prepared for eventual discharge from the very first visit. This will require continual reinforcement on each subsequent visit and a possible routine is suggested:

1. Explain the nature of the illness and the possible plan of treatment.

2. Reassurance regarding the provision of other supporting services.
3. Praise and encouragement for the relatives.
4. Provide some indication regarding the probable number of weeks duration of treatment. The mean number of weeks of treatment in 160 cases within the South Birmingham Health District was twelve weeks.
5. This routine should be repeated on each visit so that the family is conditioned to expect the eventual termination of treatment.

There will be cases where treatment will continue indefinitely on a restricted basis as described earlier.

The provision of adaptations within the home, the arrangement of visits to stroke clubs, day hospital, luncheon clubs and so on may all have to be organized by the domiciliary physiotherapist. Volunteer schemes such as the CHSA volunteer stroke scheme provide valuable support in certain areas and the geriatric health visitor can help at this stage particularly with regard to holiday relief admissions to hospital. It may be necessary to provide certain patients with a wheelchair and to instruct them in its use prior to discharge, with possible adaptation of the home environment, such as the provision of wooden ramps or the removal of some internal doors.

In the case of the patient who will require long-term institutional care in either a young chronic sick unit or in a Cheshire Home, the contact with the domiciliary physiotherapist will assist the patient to endure the stress associated with such a transfer and will help him to adapt more readily to his new surroundings.

The domiciliary treatment of a stroke patient is undoubtedly cost effective although requiring considerable effort, ingenuity and dedication on the part of the physiotherapist concerned. The increasing

realization, by District Management Teams, of the value of domiciliary treatment, is helping this specialist to take her place alongside the GP and district nurse as a full member of the primary health care team.

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APPENDIX 9

EXPLORATION OF A PHYSIOTHERAPY TREATMENT

EXPLORATION OF A PHYSIOTHERAPY TREATMENT

The idea for this particular study was conceived during the initial pilot study in 1977. The opportunity to investigate the types of interaction that occur within a physiotherapy treatment did not arise until mid-1980 when a grant from the Regional Board Research Committee allowed the work to be commenced. The whole of this study is recorded on 10 video tapes which can be viewed by arrangement.

This report is included in the appendix for two reasons: the investigations described are relevant to the clinical practice of physiotherapy and the physiotherapist who consistently achieved the highest rating is a member of the domiciliary physiotherapy staff, Miss J Price.

Exploration of a Physiotherapy Treatment

A definition of physiotherapy, frequently quoted, is as follows: "Physiotherapy is the treatment of injury and diseases by physical means. It is used to help patients to regain and increase their physical abilities, to give them the opportunity to achieve their maximum potential in activities at home, work and leisure." C.S.P. Curriculum (1978)(b).

Most definitions of physiotherapy contain variations of the above statement which does not do full justice to either the science or the art involved in carrying out a successful physiotherapy treatment. One reason for the difficulty in obtaining a definitive description of physiotherapy is the eclectic nature of the discipline, another is the relative dearth of scientific evaluation of the various treatment procedures utilised.

Many physiotherapists treat patients using a wide variety of methods, often empirically based, with marked success but without any clear idea why one method proves superior to another.

The word 'physiotherapy' is a hybrid, derived from the Greek, 'physis' meaning nature, and 'therapeutike' meaning the art of healing. It is not surprising to discover that art is involved in the application of treatments used in physiotherapy, as the success of a remedial interaction can often depend upon the way in which it is carried out, rather than upon any specific method or particular equipment employed. Physiotherapy, in common with its name, is a hybrid combining both science and art, the two components being interwoven and difficult to separate, Frazer (1975)(m).

A Chartered Society Working Party has produced a more comprehensive definition of a physiotherapist, Jenkins (1975), which states: "The physiotherapist is a member of the rehabilitation team in which a physician or a surgeon assumes primary clinical responsibility; assesses the patient and plans a programme of treatment in which advice to patients and relatives in the management of the condition plays an important part. The physiotherapist treats medical and traumatic disorders of the locomotor system (bones, joints, muscles); neurological disorders, certain cardio-vascular and respiratory conditions; the pre and post-operative treatment of surgery of the

thorax, abdomen and pelvis; the special problems of children including the mentally and physically handicapped, and the elderly; ante and post-natal training and certain skin conditions. By physical means teaching movement to individual and groups of patients with the aims of relaxing, mobilising, strengthening and improving co-ordination. The use of gymnastic apparatus and the therapeutic pool; encouraging and facilitating maximum function related to daily living and work; administering massage to soft tissues and the passive mobilisation of joints; applying heat in the form of infra-red rays, short-wave diathermy, and wax or hot packs and cold using ice; muscle stimulating currents, ultrasonics, ultra-violet rays.

Treatment is given in the wards and out-patient departments of general hospitals and special units, in community services with home visits and in special schools and in private clinics.

The above description, although comprehensive, is no more than a list of the various procedures available along with the areas in which they might be carried out. Although the teaching of skills is mentioned, there is no indication that a sound knowledge of the behavioural sciences is required.

The experiment described below was designed to investigate a number of familiar and simple physiotherapy procedures. The aim was to explore the clinical interaction between patient and therapist and to identify certain factors common to a number of physiotherapy treatments. It also seeks to explore the nature of the professional approach to that adopted by an unqualified but experienced physiotherapy aide.

Investigations

1. Measurement of physical, psychological, social and educational content of treatment.
2. Assessment by the patient of the operators effectiveness and ranking of the various treatments.
3. Effect of various personalities on the clinical interaction.
4. Effect of the factors outlined in (1) on the patients perception of a treatment.
5. Comparison of treatment by qualified and un-qualified staff.

Method

A group of five physiotherapists and five unqualified physiotherapy helpers were required to perform each of three simple physiotherapy treatments on one patient over a period of three weeks. Each separate procedure was carried out by all subjects on the same day.

Treatment Procedures

1. Infra-red to back and simple back exercises.
2. Teaching patient and knee flexion, plus simple static quadriceps exercise.
3. Teaching patient to walk up two steps on crutches.

Selection of Patient

A single patient was used throughout the experiment in order to obtain a consistent approach to measurement. The patient was male, twenty-two years of age, with a degree in law. He is currently working as a hospital porter while awaiting further training. He is a rugby player and was suffering from a number of minor injuries including a lumbar strain and damage to his right knee with consequent pain. He was unfamiliar with any of the procedures to be utilised in the experiment and had not received any physiotherapy treatment prior to the experiment. The patient was acquainted with the Selly Oak Hospital staff but did not know any of the five staff from the other hospitals.

Experiment (Part 1)

All of the participants were informed that they were required to treat a patient who had suffered a slight back injury while playing rugby. They were instructed to prepare him for a short treatment of infra-red and then to give him a series of simple exercises to improve the back muscles. They were given no other instructions other than that they were limited to a period of ten minutes and that they might be filmed at various stages of the exercise.

Experiment (Part 2)

This was carried out on the following week and the participants were informed that the patient had injured his left leg at the previous weekend. They were asked to give him a simple static quadriceps exercise, followed by knee flexion and extension exercises. An additional test was included on this occasion in order to determine the reaction of the various staff involved. The patient was instructed at the commencement of the days experiment to ask each 'therapist' the following question: "Should I play rugby on Saturday?"

Experiment (Part 3)

The final part of the experiment was carried out on the third week and this time the participants were asked to instruct the patient in crutch management while negotiating a small flight of steps. For the purpose of the experiment the patient had volunteered to have his left leg encased in a long-leg plaster.

Selection of Staff

The experiment involved five qualified physiotherapy staff and five physiotherapy aides. The physiotherapist all work at Selly Oak Hospital, the physiotherapy aides work at four different hospitals, one from an orthopaedic hospital, one from a geriatric day-hospital, one from the district general hospital, and two from a geriatric hospital.

The average age of the physiotherapist was twenty-nine and that of the aides was thirty-five. The age range was 22 - 41 for the physiotherapists and 31 - 44 for the aides.

The staff were randomly selected from a population of 80 physiotherapists and 40 aides, and had received no information about the experiment other than that described above. They all wore physiotherapy uniforms with no distinguishing features and were each instructed beforehand not to reveal either their grade or their place of work to the patient until the completion of the whole experiment.

Measurements

1. Video-tape recording of treatment.
2. Psychological testing of patient and therapists.
3. Patient questionnaire.
4. Ranking of treatment by patient on completion of each procedure.
5. Analysis of video-tape by two independent observers, measuring:
 - a) number of verbal exchanges initiated by operator.
 - b) number of verbal exchanges initiated by the patient.
 - c) amount of praise or encouragement given by the operator.
 - d) time spent looking at patient and frequency.
 - e) time spent in and frequency of touching the patient.
 - f) content analysis of the conversation carried out.
 - g) clinical competence of operator (judged by experienced clinical teacher).
 - h) frequency and duration of silent periods during the treatment.
6. Content analysis of the total video film of each therapist.

Equipment Used

Two remote controlled video cameras with split screen facility and instant mixing.

Video-tape recorder and monitor screens.

Stopwatch.

Two hand-held counters.

Infra-red lamp.

Plinth.

Set of steps.

Chair.

Sheets, pillow and blanket.

Questionnaires.

Eysenk personality inventory.

Crutches.

Treatment timer.

Procedure

The experiment was carried out each Wednesday over a period of three successive weeks.

The experiment began each day at 9.30 am and the patient received treatment from five staff during the morning and during the afternoon, as shown on the time-table:

9.30 - 9.40		1.30 - 1.40
10.00 - 10.10		2.00 - 2.10
10.30 - 10.40	LUNCH	2.30 - 2.40
COFFEE	12.00 - 1.20	3.00 - 3.10
11.00 - 11.10		3.30 - 3.40
11.30 - 11.40		4.00 experiment ends

During the period following each treatment procedure, the patient completed a questionnaire designed to measure various aspects of the treatment. Staff were assigned to the different treatment times by drawing lots and they all wore the same uniform. They did not know when the filming would commence or end as the cameras were remote controlled. Staff had no access to the patient's case history and no instructions given other than those outlined above. They were asked to remain within camera view, during the treatment.

The staff involved were asked to arrive at the studio fifteen minutes before their session was due to begin. They did not have an opportunity to meet one another until the completion of the day's filming. The experiment was carried out in the film studio of the Hayward Building, Department of Geriatric Medicine, University of Birmingham.

The films recorded during the experiment were contained on ten video-tapes, one for each participant. These tapes, each lasting thirty minutes, were analysed in turn by two observers in the following way.

Video Tape Analysis

A VTR Recorder and monitor screen was provided and each separate tape was analysed fully. Two observers sat in front of the monitor watching the film and the following elements were identified and measured:

1. Touch, the number and duration.
2. Gaze, the number and duration.

3. Speech initiated by the operator.
4. Speech initiated by the patient.
5. Instructions to the patient.
6. Information given to the patient.
7. Silence as a percentage of the total treatment period.
8. An assessment was made of each treatment by a separate clinical teacher, judging it by the standards attained by student physiotherapists in their second year of training.

Content Analysis

At the first showing of the film, observer 'A' counted the number of times the operator touched the patient while simultaneously operator 'B' timed the duration of touching throughout the sequence. The film was then re-run with operator A and B changing tasks.

A laboratory counter was used and a stop watch accurate to 0.1 second was used for the timing.

The operators recorded their findings independently and they were then compared. Provided the figures obtained were in agreement within a 10% leeway, the mean was obtained and this single figure was recorded for the subject.

This procedure was carried out for each of the elements described in turn and the results are contained in the following section.

Results

Considerable differences were demonstrated between the physiotherapists and the physiotherapy aides, both in the approach to treatment and in the content of the treatments. These differences are shown in the tables and are described below under separate headings.

Touch - Table 55

In the first treatment the physiotherapists spent longer periods touching the patient, $P < .05$, although there was little difference in the number of separate touches between the two groups. This result can be explained by the practice adopted by the physiotherapists, of palpating the injury and monitoring the muscle function during the exercises. In the case of the aides, the touching was casual, examination was cursory and the monitoring, if present, was incomplete.

In the second treatment there was no significant difference between the physiotherapists and the physiotherapy aides in the duration of touch but the physiotherapists touched the patient more frequently, $P < .05$. The quality of touching showed similar differences between the groups to those described above.

In the third treatment the difference between the groups was not significant. The aides touched the patient more and for longer periods than the physiotherapists. The nature of the exercise, crutch walking including stairs, reflected a greater confidence on the part of the physiotherapists who were prepared to release the patient for longer periods than the aides.

The score, shown in the left hand column for each of the treatments, is the rating awarded by the patient for that particular treatment. The physiotherapists showed a mean score of 5, 5, and 4.6 for the

three treatments, and the aides showed a mean score for the same treatments of -3.8, -1.2 and -1, respectively. The difference between the two groups was significant, $P < .02$.

On two occasions an aide displaced a physiotherapist from the top five ratings, in the second treatment an aide was rated 5th and in the third treatment another aide was rated equal 3rd.

Gaze - Table 56

The gaze which is recorded in Table 56 is the actual time spent in eye contact during the treatment period. In the first treatment the physiotherapists spent considerably longer periods in eye contact with the patient, $P < .05$. There was no significant difference in the number of separate instances although there was a considerable difference in the range of the two groups, reflected by the difference in the standard deviation.

In the second treatment there was a difference between the two groups in the number of eye contacts with the physiotherapists looking more frequently, $P < .20$. The difference was not regarded as statistically significant for a sample of this size.

The third treatment did not reflect any significant difference between the physiotherapists and the aides.

Speech, Tables 57, 58, 59, 60 and 61

Table 57 provides information on the number of separate verbal utterances as well as the periods spent in silence during each treatment, the latter expressed in percentage terms. Separate verbal utterances could range from a single word to a complete sentence.

There was no significant difference between physiotherapists and aides in the number of separate utterances. There was a significant difference in the amount of silence between the two groups in all three treatments, with the physiotherapists twice as vocal as the aides, $P < .001$, $P < .001$ and $P < .05$ respectively for the three separate treatment periods.

Content of Speech

Treatment 1, Table 58

The speech was broken down into four separate divisions as shown. Items of information and advice, separate instructions, general conversation, assessment and evaluation. For example a statement that infra-red should not be too hot as a burn could result was listed under the first column. An instruction to lift the leg was listed under the second column and so on.

All of the verbal interchanges were sub-divided and recorded in this way in Tables 58, 59 and 60.

There was a significant difference between the groups in the first treatment, with the physiotherapists almost twice as vocal as the aides in three of the sub-divisions, information and advice, $P < .05$, separate instructions, $P < .05$, and assessment and evaluation $P < .05$. There was no significant difference between the groups in general conversation.

Treatment 2, Table 59

Significantly more advice and information was provided by the physiotherapists $P < .01$, there was no significant difference in the number of separate instructions given by each group, the aides

indulged in significantly more general conversation, $P < .05$, while physiotherapists undertook significantly more assessment and evaluation than the aides, $P < .001$.

Treatment 3, Table 60

The items of information and advice provided were marginally greater in the physiotherapy group but not significantly so, $P < .10$, physiotherapists gave more separate instructions than the aides, $P < .05$. There was no significant difference between the two groups in either general conversation or assessment and evaluation.

Patients Speech

The patients speech during each of the three treatment periods was, with a few exceptions, limited to the monosyllabic answering of questions. During the first treatment he spoke significantly more to the physiotherapists than to the aides, $P < .05$. There was no significant difference between the two groups in the other two treatments (Table 61).

Treatment Rating by a Clinical Teacher

All of the treatments were rated by a clinical teacher who rated the three separate treatments against a standard of clinical competence expected of a second year physiotherapy student, Table 62. This rating was loosely based on the CARB assessment.

The teacher, with over fifteen years experience, viewed all of the films, some more than once, over a period of several days, before coming to any decision regarding grades of pass.

The final gradings, shown in Table 62, are based on the clinical content of each treatment, the competence of the operator and the overall impression gained by the assessor. The top five grades were assigned to the physiotherapists, the aides achieving among their number, two overall 'passes', two 'bare passes' and one 'fail'.

The gradings were converted to numerical scores as follows, 1 for a P-, 2 for a P, 3 for a P+, and 4 for a GP. Using these figures a significant difference was found to exist between the performance of the physiotherapists and that of the aides, $P < .01$.

A Spearman Rank Correlation was carried out on the ranking of the staff by the patient and by the teacher and a positive correlation was found to exist between their respective gradings, $r_s = 0.73$.

Patient Rating of Treatment

Table 63 shows the rating of each treatment, made immediately following the end of the treatment by the patient. There was a significant difference between the physiotherapists and the aides scores, $P < .001$.

Patient Rating of Staff

Table 64, shows the rating by the patient of the staff on a scale detailing sense of humour, friendliness, attractiveness and poise. No significant difference was found to exist between the physiotherapists and the aides, for these elements.

Discussion

It is recognised that the experiment is, of necessity, a representation of reality. The artificiality of the situation was somewhat

lessened by the fact that the therapist and the patient were alone in the film studio, the cameras were remotely controlled and there was no indication when the filming began or ended.

The 'patient' was a rugby player who was conveniently suffering from a back injury on the first week of the experiment. The following week he was recovering from a kick on the left knee and the participants were faced with a typical sports injury, even down to the stud marks.

For the final part of the experiment on the third week, the patient had his left leg encased in a long-leg plaster which added realism to the problem posed, i.e. teaching the use of crutches and stair climbing using crutches. The patient was not familiar with any of the procedures to be carried out, although he did learn during the course of filming. To avoid any learning effect bias, the 'batting order' for each of the participants was randomly decided.

Even if no generalisations can be made about the relative benefits of qualified staff treatment compared to that of unqualified staff, it is still possible to compare the differences between the various individuals involved, the way in which they coped with the novelty of working in a film studio, the stress of being observed and the element of unreality associated with an experiment of this kind.

As all subjects were exposed to identical conditions during the experiment, the different strategies adopted could be observed and compared. In spite of the obvious limitations described, it has proved possible to identify certain characteristics which are common to what might be described as an acceptable physiotherapy treatment. It has not always proved possible to readily distinguish between some of the qualified staff and some of the unqualified aides. There was a broad spread of E and N scores in the individuals taking part in the experiment, Table 65.

The E score represents the extroversion-introversion aspect of the personality while the N score represents the neuroticism-stability aspect. The population norms for these scales is 12.07 for the E scale and 9.07 for the N scale. Research among student physiotherapists, Child (1974), showed that these scores were increased for these individuals, the E score being 13.63 and the N score, 11.66. He suggested that the physiotherapists could be described as neurotic extroverts.

In this experiment there was no significant correlation between the personality rating and the rating made by the patient of their performance with the exception of the N scale in part 2 of the experiment when it was found that for the second treatment there was a correlation for the aides alone, $P < .05$. It was also worth noting that the three aides who were rated highest by the teacher all had E scores in excess of the averages mentioned above. Although the sample is small it might be worth repeating this experiment using aides alone in order to isolate this variable to determine whether some form of personality test might be adopted which could be of value in recruitment decisions about unqualified staff.

It is hardly surprising that this experiment confirms the approach of the qualified staff is significantly different from that of the unqualified aides. With the physiotherapists the level of interaction is increased in terms of touching, eye contact and verbal exchange. There is also considerably more verbal exchange within the treatment given by the qualified staff. The three physiotherapists scoring highest in clinical competence also looked more at the patient, touched him more often and for longer periods and had the shortest periods of silence during the course of their treatments. This might suggest that touch, eye contact and verbal interaction are all significant elements in what is rated as a successful physiotherapy treatment.

The quality of interaction is also different in that the touching by the qualified staff can be seen to be discriminating and evaluative whereas that of the aides is hesitant and, on occasions, perfunctory.

There is not a significant difference overall in eye contact although the demeanour of the physiotherapists expressed a greater confidence. The most marked difference was noted in the verbal interaction, the physiotherapists were able to provide information and advice in greater quantity and detail and their assessment and evaluation showed similar differences. There was more general conversation during the treatments given by the aides. This possibly reflects the greater knowledge and the professional training enjoyed by the physiotherapists.

With the significant differences shown between the physiotherapists and the aides when carrying out such simple procedures it is possible to assume that an even greater difference would be measurable should more complex procedures or treatments be carried out. It is likely that the training the physiotherapist receives is the major factor responsible for the superiority of these staff and the possession of exclusive technical competence is one of the criteria of a profession. The fact that the physiotherapists participating in the experiment trained at four different physiotherapy schools would also suggest that a universal standard of training is provided.

It should be stressed that the aides taking part in the experiment are all experienced, with at least three years spent working in a physiotherapy department and this is reflected in the very creditable performance that they gave. It would appear to be a matter of some importance that physiotherapy aides are given some form of basic training in order to exploit their obvious potential to the maximum while at the same time giving them greater awareness and job-satisfaction.

It is possible to construct a flow-chart outlining the strategies which are adopted during a physiotherapy treatment that are common to

any treatment procedure irrespective of the modalities utilised, Fig. 72. This represents the physiotherapy treatment as a dynamic interaction with the main components linked by a heavy pathway and the secondary components linked by a light line. Having received a diagnosis the physiotherapist carries out her observation, evaluation and assessment using touch, vision and speech as described earlier. A decision as to the type of treatment utilised and the form which it will take is made, the treatment is implemented and a continuous monitoring takes place, both by feedback from the patient and by observation on the part of the physiotherapist again using touch, vision and voice. It is also possible to add to the definition of physiotherapy as follows:

Physiotherapy is the treatment of illness or injury by physical means, utilising the components of human interaction, augmented and enhanced by a comprehensive theoretical knowledge, with continuous monitoring and reassessment forming an integral part of the process.

It is expected that experiments similar to this, described above, will be carried out with the variables of touch, gaze and speech more closely controlled and using different staff and different conditions before any definite conclusions may be drawn as to the essence of a physiotherapy treatment.

The films recorded during this experiment can be viewed by interested parties by arrangement with the author.

Acknowledgements

The author is indebted to the physiotherapists and aides of the South Birmingham Health District who willingly participated in this testing and unusual experiment which would have been impossible without their ready co-operation.

TABLE 55: Number and Duration of Touches During Treatment.

	I.R. & Back Exercises					Leg Exercises					Crutch Walking				
	Score	No's Touch	Time Touching	% of Rx	Mean %	Score	No's Touch	Time Touching	% of Rx	Mean %	Score	No's Touch	Time Touching	% of Rx	Mean %
Physio A	8	21	171	26.8		7	23	291	48.66		8	31	463	67	
Physio B	4	24	90	15.98		1	24	394	52.32		3	7	361	79.16	
Physio C	4	9	143	24.32		5	25	216	40.6		4	7	25	4.96	
Physio D	7	15	204	26.32		8	36	263	35.44		6	2	15	3.39	
Physio E	2	11	120	27	24.08	4	35	233	50.98	45.6	2	15	131	29.3	36.76
Aide A	-3	18	111	21.85		-2	16	371	61.22		-6	10	64	10.42	
Aide B	-1	11	81	19.05		-4	24	207	42.24		-4	37	378	52.35	
Aide C	1	5	112	23.48		-1	19	74	14.06		1	20	115	25.2	
Aide D	-1	15	84	17.49		3	7	244	70.72		1	11	366	75.30	
Aide E	-5	21	87	18.99	20.17	-2	23	129	24.33	42.51	3	26	268	48.20	42.29

PHYSIOS: Mean No 16
SD 6.4

AIDES: Mean No 14
SD 6.2

Mean No 28.6
SD 6.3

Mean No 17.8
SD 6.8

Mean No 12.4
SD 11.3

Mean No 20.8
SD 11.2

$P < .05$

Duration $P < .05$

Duration N.S.

Duration N.S.

Table 56: Number and Duration of Eye Contacts During Treatment.

	I.R. & Back Exercises					Leg Exercises					Crutch Walking				
	Score	No's Gaze	Duration Gaze	% Total	Mean %	Score	No's Gaze	Duration Gaze	%	Mean %	Score	No's Gaze	Duration Gaze	%	Mean %
Physio A	8	40	81	12.69	6.71	7	25	46	7.69	3.382	8	24	23	3.32	4.038
Physio B	4	7	15.4	2.73		1	8	6.9	0.91		3	14	7.2	1.57	
Physio C	4	2	5.5	0.93		5	27	25.5	4.79		4	24	32	6.34	
Physio D	7	28	117.8	15.19		8	20	15.5	2.08		6	14	35	7.91	
Physio E	2	5	9	2.02		4	10	6.6	1.44		2	12	4.7	1.05	
Aide A	-3	3	2.1	0.41	0.398	-2	9	10.8	1.78	1.51	-6	13	8.6	1.40	2.366
Aide B	-1	9	4.5	1.05		-4	15	7.5	1.53		-4	16	18	2.49	
Aide C	1	0	0	0		-1	4	1.9	0.36		1	3	1.2	0.26	
Aide D	-1	3	0.7	0.14		3	8	7.1	2.05		1	2	7	1.44	
Aide E	-5	3	1.8	0.83		-2	7	4.4	0.38		3	34	34.7	6.24	

PHYSIOS: Mean No 16.4 SD 16.7
 AIDES: Mean No 14 SD 6.2
 Duration P < .01

Mean No 18 SD 8.6 P < .20
 Mean No 17.8 SD 6.8
 Mean No 17.6 SD 5.8
 Mean No 20.8 SD 11.2
 Duration & No. N.S.

TABLE 57: Number of Separate Verbal Utterances By The Therapist and % of Silence During Each Treatment.

	Number of Utterances	% Silence	Mean SD	Number of Utterances	% Silence	Mean SD	Number of Utterances	% Silence	Mean SD
Physio A	106	27.11	119.8 13.00	185	13.94	154.6 25.67	219	17.36	130.2 51.40
Physio B	124	24.06		179	29.08		98	15.35	
Physio C	106	39.45		138	35.43		118	23.15	
Physio D	130	28.80	33.18 9.43	128	22.23	25.25 7.99	92	15.83	21.79 9.19
Physio E	133	46.50		143	25.60		124	37.27	
Aide A	92	47.38		87	40.42		90	59.28	
Aide B	38	72.38	85.6 28.91	85	56.53	114.4 34.11	102	61.10	130 38.26
Aide C	117	56.47		128	45.38		118	37.75	
Aide D	92	72.79	62.77 10.88	105	49.76	51.47 9.72	162	26.83	43.59 15.65
Aide E	89	64.84		167	65.28		178	33.00	

P < .001

P < .001

P < .05

Table 58: Analysis of Therapists Speech During Treatment - 1

	Items Of Information/Advice	Separate Instructions	General Conversation	Assessment & Evaluation
Physio A	40	56	26	19
Physio B	14	56	4	19
Physio C	8	55	2	28
Physio D	47	56	11	33
Physio E	11	70	6	11
Aide A	7	39	16	12
Aide B	1	17	8	5
Aide C	7	61	18	7
Aide D	2	26	4	13
Aide E	1	50	6	4

P < .05

P < .05

N.S.

P < .01

Table 59: Analysis of Therapists Speech During Treatment - 2

	Items of Information/Advice	Separate Instructions	General Conversation	Assessment & Evaluation
Physio A	34	111	2	13
Physio B	26	147	6	22
Physio C	16	99	5	20
Physio D	37	58	17	14
Physio E	13	54	5	19
Aide A	12	37	28	8
Aide B	3	44	25	4
Aide C	4	59	30	7
Aide D	2	49	14	5
Aide E	7	108	7	4

$P < .01$

$P < .20$

$P < .05$

$P < .001$

Table 60: Analysis of Therapists Speech During Treatment - 3

	Items of Information/Advice	Separate Instructions	General Conversation	Assessment & Evaluation
Physio A	37	81	29	16
Physio B	22	83	2	21
Physio C	37	70	9	6
Physio D	45	40	19	6
Physio E	8	49	5	4
Aide A	15	11	45	7
Aide B	2	27	44	5
Aide C	19	50	18	4
Aide D	9	49	10	25
Aide E	26	40	9	9

$P < .10$

$P < .05$

N.S.

N.S.

TABLE 61: Number of Patient Utterances.

	Treatment 1		Treatment 2		Treatment 3	
	No.	Secs.	No.	Secs.	No.	Secs.
Physio A	59	55.3	41	36.5	54	32.7
Physio B	38	61.5	49	52	27	7.5
Physio C	72	74	59	106.5	21	14.6
Physio D	39	101	40	67	41	19
Physio E	22	35	37	61	22	20
Aide A	49	52	55	49	48	29
Aide B	25	28.5	28	45.5	54	28.3
Aide C	22	12.5	21	40	20	5.5
Aide D	23	28.5	17	26.5	35	22
Aide E	23	29	22	11.5	66	55

$P < .05$

$P < .10$

N.S.

Table 62 : Grading of Staff

STAFF	Treatment 1		Treatment 2	Treatment 3	Average	Rank.
	Infra Red	Back Exercises	Knee Exercises	Crutch Walking		
Physio A	P	P+	GP	P	P+	3
Physio B	GP	GP	GP	P	GP	2
Physio C	P-	P-	P+	P	P	5
Physio D	P	GP	GP	GP	GP	1
Physio E	P-	P	P+	P	P	4
Aide A	F	P-	P-	P	P-	8
Aide B	P	F	P	P	P	6
Aide C	F	F	P-	F	F	10
Aide D	P-	F	P+	P	P	7
Aide E	F	P	P	F	P-	9

Key:

F = Fail

P- = Bare Pass

P = Pass

P+ = Good Pass

GP = Credit

Table 63: Rating of Staff by Patient.

STAFF	TREATMENT 1	TREATMENT 2	TREATMENT 3	RANK
Physio A	9	9	9	2.
Physio B	8	7	8	4=
Physio C	8	9	8	3
Physio D	10	9	9	1
Physio E	8	8	7	4=
Aide A	6	5	4	9
Aide B	7	4	3	10
Aide C	7	4	7	6=
Aide D	6	6	6	6=
Aide E	5	5	6	8

Table 64 : Rating by Patient (Sense of Humour, Friendliness, Attractiveness, Poise)

STAFF	Treatment 1	Treatment 2	Treatment 3	Rank
Physio A	3	1	0	3=
Physio B	-2	-2	-2	9
Physio C	2	2	3	1
Physio D	-1	0	-2	8
Physio E	0	0	2	5
Aide A	0	2	2	3=
Aide B	1	-2	-1	6=
Aide C	-1	0	-1	6=
Aide D	0	4	1	2
Aide E	-3	-2	-2	10

Table 65 : Comparison of Extroversion and Neuroticism Scores.

STAFF	E SCORE	N SCORE
Physio A	17	8
Physio B	5	5
Physio C	15	14
Physio D	5	6
Physio E	13	7
Aide A	8	11
Aide B	16	3
Aide C	12	12
Aide D	20	13
Aide E	9	21

	Mean	S.D.
Physiotherapists	E 11	5.656
	N 8	3.535
Aides	E 13	5
	N 12	6.403

APPENDIX 10

EFFECT OF THE PHYSIOTHERAPIST'S
PRESENCE AND TOUCH

Study 2

The second study is included in the report as the results show that a patient is influenced by the presence of the physiotherapist. It is possible that the uniform worn may contribute to this effect and this element will be used as a dependent variable in a future investigation. This second study links with the pilot study described in the following chapter which is investigating the effectiveness of unqualified staff carrying out domiciliary treatment.

Physiotherapy is often subject to criticism because few, if any, of the treatment procedures utilised have been adequately investigated. Many of the treatments embody varying numbers of variables including the physical, psychological and sociological and this makes testing more difficult. A second problem is the relative lack of availability of sophisticated measuring devices such as the 'Polgon' electronic goniometer, access to VTR systems, force plates, EMG and oxygen uptake systems and so on. Many physiotherapists are relying on the MRC grading and the pocket plastic goniometer, obtained free from certain drug firms, plus a tape measure as their mainstays of objective measurement.

With goodwill from certain university departments plus continual application to Regional Authority Research Committees, it is possible to obtain access to some of the more sophisticated measuring devices mentioned above, and even to purchase various small items of equipment. This will allow certain simple research projects to be initiated.

A programme of research, involving equipment including Digital Heart Rate Monitor, Blood Pressure Recorder and Galvanic Skin Response

Recorder, plus psychological testing is currently being undertaken at Selly Oak Hospital.

The experiment which is described below is part of the overall programme which seeks to determine which elements of physiotherapy treatment may be of value in the rehabilitation of the patient.

Introduction

This experiment was designed to test the patient's reaction to the presence of the physiotherapist, and to certain procedures used during the course of treatment.

The treatment used was straightforward infra-red followed by a five minute period of simple effleurage to the whole back. The patient's reaction to these procedures was measured (in two ways):

1. The change in pulse rate, by means of a Digital Heart Monitor, which was connected to the patient by means of a long lead terminating in a finger transducer, and
2. By measurement of the Galvanic Skin Resistance.

At the end of the treatment period the patient was then asked to complete a simple questionnaire, Fig. 74.

Two physiotherapists took part in the experiment, each treating a total of twenty patients, ten male and ten female. The readings from the two monitors were recorded by the author and the questionnaire was presented by a member of the department's clerical staff. The experiment was carried out over a three week period in the out-patient physiotherapy department at Selly Oak Hospital.

You are invited to participate in an experiment which seeks to investigate the relationship between temperature and certain physiotherapy treatments.

Three small recorders will be placed on the fingers of your left hand and you are requested not to remove them until instructed.

Thank you for your co-operation.

Fig. 73

An Invitation to Participate
In The Experiment

PATIENT QUESTIONNAIRE

This questionnaire is designed to investigate the reactions to the treatment which you have recently received. Your responses will be strictly confidential and will not be revealed to any person other than the research worker, and the questionnaire is entirely anonymous.

Thank you for your co-operation.

You are required to read five statements connected with your physiotherapy treatment and to circle the comment nearest to your own opinion.

1. The physiotherapist is good at his/her work.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>strongly</u>		<u>either way</u>	<u>agree</u>	<u>disagree</u>

2. The treatment is pleasant but not very effective.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>strongly</u>		<u>either way</u>	<u>Agree</u>	<u>disagree</u>

3. Physiotherapy treatment is not effective.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>Strongly</u>		<u>either way</u>	<u>Agree</u>	<u>Disagree</u>

4. Tablets from the doctor are preferable to physiotherapy treatment.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>Strongly</u>		<u>either way</u>	<u>Agree</u>	<u>Disagree</u>

5. The physiotherapist is an attractive person.

Agree	<u>Agree</u>	No opinion	Do'nt	Strongly
<u>Strongly</u>		<u>either way</u>	<u>Agree</u>	<u>Disagree</u>

Patient Number Male/Female

Age

Physiotherapist Male/Female

Pulse rate on application of Pulse Monitor		
Pulse rate following Five minutes rest		
Pulse rate on entry to cubicle of Physiotherapist		
Pulse rate after two minutes Infra-red		
Pulse rate on completion of five minutes to back		
Pulse rate when Physiotherapist re-enters cubicle		
Pulse rate when massage treatment commenced		
Pulse rate after two minutes massage		
Pulse rate when five minutes massage treatment ended		
Pulse rate one minute after Physiotherapist leaves cubicle		
Pulse rate when Physiotherapist returns to terminate treatment		

Date

Methodology

The two physiotherapists co-operating in the experiment each selected from their lists of patients ten of either sex suffering from some form of back complaint and lists were prepared to facilitate the organisation of the experiment to allow at least three patients to be monitored each day. When a patient on the list attended for treatment, they were handed a card, Fig.73 which asked them to co-operate in an experiment. This card described the experiment as being an investigation into the relationship of temperature to certain physiotherapy procedures. This deception was employed in order to try and prevent the patient's knowledge of the true experiment from influencing the results.

When the patient was prepared for treatment, which involved undressing and lying in the prone position on a plinth with the lower half of the body covered by a blanket, the patient inserted the little finger of the left hand into the transducer, and the PGR electrodes were placed on the middle and ring fingers of the same hand. Leads from both sets of electrodes led to the instruments in an adjacent cubicle.

The changes in the patient's pulse rate and galvanic skin reaction were then recorded on the record sheet at the intervals shown, Fig.75. When the treatment ended the patient was asked by the clerk to complete the questionnaire.

Equipment

EMS Theralux Infra-red Lamp with three red emitters which provide immediate heating.

Digital Heart Rate Monitor

PGR Unit with earphones

Stopwatch

Questionnaire

Talcum Powder

Measurements

Pulse Rate

It is well documented that the pulse rate varies with different stimuli, Karlins & Andrews (1973). It was decided that such a measurement could be used to determine whether the presence and touch of the physiotherapist contributed to change in the cardiovascular response of the patient. The pulse rate monitor is designed to show the pulse rate on continuous display with any change shown every sixteen seconds. The equipment is battery operated and the transducer which is placed over the finger determines the pulse rate by blood flow opposite the nail root of the finger.

Pulse rate is dependent on three variables, Ruch (1955).

1. The rate and volume of the ventricular discharge.
2. The velocity of the pulse wave.
3. The rate at which the blood flows from the arterial reservoir into the capillaries, in turn dependent upon the state of the arterioles.

It is this last variable which is of interest in this experiment as a state of arousal will influence the state of arteriole.

G.S.R.

When a subject is psychologically excited, the emotional stimulus indicates a response in the autonomic nervous system which in turn produces a response in the subject's sweat glands.

Measurement of this sweat gland activity is an indication of the

Subject's state of arousal. This sweat gland activity is known by a number of terms:

PGR - psycho-galvanic reflex

GSR - galvanic skin reflex

ESR - electrical skin resistance

These terms all relate to the change in skin resistance associated with sweat gland activity, a decrease in resistance indicating arousal, while an increase in resistance indicates relaxation. The measurements were described by C Féré in 1888, Strong (1970).

The machine employed is battery operated delivering a DC current via the electrodes. The voltage drop produced between the electrodes is measured on a meter ranging from +50 to -50 with an associated audible signal which is shut off during the experiment. No contact medium is utilized as it would interfere with the action of the sweat glands and the electrodes used are specially designed metal finger electrodes with velcro fastenings. When the electrodes are applied to the subject, the machine is balanced with the Mv meter showing 0 before measurements are commenced.

Questionnaire

The questionnaire is used to measure only one variable, that is the degree to which the physiotherapist is seen as an attractive person by the patient. The remainder of the questions are irrelevant in this experiment and are taken from another questionnaire used in the department. The style of question is based on the Likert Scale (1932) and is utilised to obtain a quick guide to respondent attitude.

A question about attractiveness is inserted into the set of five questions to disguise intent. It is suggested that persons

seen as attractive are viewed more favourably, Argyle (1979) and it is possible that both the Halo effect and the Placebo effect are involved during the dyadic interaction of physiotherapist and patient.

This experiment, as well as setting out to determine the level of arousal and the cardio-vascular response to the physiotherapist, attempts to discover whether there is any relationship between the physiological responses and the perception of the patient regarding the attractiveness of the physiotherapist, and whether there are any differences in this variable between the sexes.

Infra-red Lamp

The particular lamp used provides an immediate heating effect by means of visually emitted rays in the red band of the spectrum. The use of this apparatus in the experiment is to distract the patient from the true purpose of the experiment, i.e. to measure their response to the presence and touch of the physiotherapist.

Stopwatch

The stopwatch is accurate to .01 of a second and is used to time the duration of each individual experiment.

Talcum Powder

In order to ensure a consistent approach to each individual patient, the physiotherapists will use the same talcum powder during the massage element, the powder being the normal NHS issue.

Massage Treatment

This treatment is a basic effleurage given to the area of the back extending from the shoulders to the sacrum and is carried out for a total of five minutes.

Results

It is recognised that a sample of twenty men and twenty women is not large enough to allow any definite conclusions to be drawn. It is also clear that the experimental situation can cause certain stresses for both the patient and the physiotherapist which will in turn influence the clinical interaction. In an effort to lessen this variable for the patient, he was allowed to rest for a period of five minutes following the application of the recorders to his fingertips. The patients were randomly assigned to the study on the basis that they were suffering from either a neck or a back condition which had caused their doctor to refer them for physiotherapy treatment. It has proved possible to measure the variables, pulse rate and galvanic skin response but no attempt was made to eliminate uncontrolled variables. It is assumed that error variables are randomly distributed.

The five minute period of infra-red irradiation was given in an attempt to determine whether the recordings obtained for the two variables being examined could be accepted as valid, as it is assumed that if changes did occur, in the absence of the physiotherapist, which were linked with the infra-red irradiation, then the changes which occurred during the presence of the physiotherapist might in turn be attributable to that presence.

Table 69 illustrates the hardly surprising finding that the majority of patients prefer physiotherapy treatment to receiving

TABLE 66 : INFRA RED Change in Pulse Rate Following 5 Minute Treatment.

	PHYSIO A	PHYSIO B
MEN	+ 6.8	+ 1.3
WOMEN	+ 5.5	+ 0.5

TABLE 67: G.S.R. Change in Following 5 Minute I.R.R.

	PHYSIO A	PHYSIO B
MEN	- 14.5	- 18
WOMEN	- 9.5	- 19

TABLE 68: Tablets from Doctor are Preferable to Physiotherapy Treatment

RESPONSE	PHYSIO A		PHYSIO B		TOTAL
	MEN	WOMEN	MEN	WOMEN	
Strongly Disagree	3	1	4	6	14
Disagree	4	8	5	4	21
No Opinion	3	1	1	0	5

TABLE 69: Physiotherapy Treatment is Not Effective

Response	PHYSIO A		PHYSIO B		Total
	Men	Women	Men	Women	
Strongly Disagree	3	4	3	3	13
Disagree	6	5	4	2	17
No Opinion	1	1	2	1	5
Agree			1	4	5

TABLE 70: The Physiotherapist is an Attractive Person

Response	PHYSIO A		PHYSIO B		Total
	Men	Women	Men	Women	
Agree Strongly	5	5	3	5	18
Agree	3	5	6	5	19
No Opinion	2	0	1	0	3

TABLE 71: AVERAGE INCREASE IN PULSE RATE PER CENTAGE

	PHYSIOTHERAPIST A		PHYSIOTHERAPIST B	
	Touch	Presence	Touch	Presence
MEN	10%	13%	6%	14%
WOMEN	8%	10%	5%	10%

TABLE 72: Patients with Pulse Rates in Excess of 100

	PHYSIO A	PHYSIO B
MEN	121 (2) 165	103 (2) 108
WOMEN	168 110 (4) 149 101	103 (1)

TABLE 73: G.S.R. Following 5-minute Massage

PHYSIOTHERAPIST A		PHYSIOTHERAPIST B	
MEN	WOMEN	MEN	WOMEN
50	50	50	-45
50	50	50	-45
45	50	40	20
-45	-25	30	-50
-50	-20	50	-20
50	-50	38	35
50	-30	40	33
-50	10	38	29
50	-50	34	38
50	-25	27	32

TABLE 74: CHANGES IN PULSE RATE - PHYSIOTHERAPIST A

SEX	AGE	RESTING PULSE	(1) CHANGE ON ENTRY	CHANGE FOLLOWING IR	(2) CHANGE ON ENTRY	CHANGE ON BEGIN MASSAGE	CHANGE FOLLOWING MASSAGE	(3) CHANGE ON ENTRY	AVERAGE INCREASE OVER RESTING PULSE	
									PRESENCE	TOUCH
M	45	68	4+	0	6+	21+	26+	17+	9+	24+
	24	90	30+	+39	50+	51+	13-	26+	35+	19+
	65	68	3+	-4	3+	8-	6-	3+	3+	7-
A	65	84	4+	+8	7+	5+	4+	2+	4+	4+
	35	68	18+	+4	14+	4+	8-	5+	12+	2-
	27	56	3+	+3	4+	8+	0	8+	5+	4+
L	60	60	4+	0	4+	14+	10+	2+	3+	12+
	38	68	12+	+12	14+	7+	1+	6+	11+	4+
	57	86	2+	-2	1+	6+	-4	2+	2+	1+
E	58	70	8+	+4	6+	13+	+10	10+	8+	11+
	21	68	2+	0	10+	8+	0	12+	8+	4+
	57	80	12+	+64	84+	88+	-4	0	32+	42+
F	42	76	5+	+2	1-	1+	-6	7+	3+	3-
	64	98	5+	-5	2+	12+	-4	-3	1+	4+
	43	80	4+	0	4+	4+	-8	65+	24+	2-
A	40	66	2+	-2	6+	2+	-2	6+	5+	0
	25	76	2+	-4	4+	4+	-14	-8	1-	5-
	41	76	8+	-1	0	3+	-8	-4	2+	2-
E	60	99	1+	+1	1+	1+	-2	+1	1+	1-
	69	68	0	0	0	4+	+5	0	0	3+

TABLE 75: CHANGES IN PULSE RATE - PHYSIOTHERAPIST B

SEX	AGE	RESTING PULSE	(1) CHANGE ON ENTRY	CHANGE FOLLOWING IR	(2) CHANGE ON ENTRY	CHANGE ON BEGIN MASSAGE	CHANGE FOLLOWING MESSAGE	(3) CHANGE ON ENTRY	AVERAGE INCREASE OVER RESTING PULSE	
									PRESENCE	TOUCH
M	45	72	4+	-6	-4	-7	-4	0	0	-5
	32	63	17+	+2	+6	+5	+2	+5	9+	3
	22	85	11+	+3	+8	+18	+15	+18	12+	16
	46	76	6+	0	+4	0	-4	+7	5+	-2
	34	68	18+	0	+8	+21	+16	0	8+	+8
	65	68	15+	0	+18	+18	+8	+4	12+	+6
L	42	71	22+	+6	+13	+13	+9	+14	16+	+11
	49	57	7+	+7	+13	+5	-1	+25	15+	+1
	27	59	17+	+1	+4	+1	+1	+16	12+	+1
E	63	56	6+	0	+8	+4	+4	+12	8+	+8
F	38	60	6+	+4	+8	+6	+4	+4	6+	+4
	26	76	15+	-4	0	+11	-4	0	5+	-2
	68	68	4+	0	+4	-1	0	+10	6+	0
	45	64	8+	+12	+20	+23	+11	+18	15+	+14
	65	77	7+	0	+8	+26	-3	0	5+	+11
	42	75	4+	-8	-5	-4	-12	-4	1-	-8
	67	78	5+	+2	+5	+17	-6	+9	6+	+5
	51	68	15+	+8	+16	+8	+8	+21	16+	+8
	69	68	11+	-4	+8	+12	0	+2	10+	+6
	62	89	1+	-1	-1	-1	-1	+2	2+	-1

tablets from their doctor, as this confirms findings in earlier studies, Frazer (1980)(1).

Table 69 gives the responses to the statement 'physiotherapy is not effective' and it is clear that physiotherapist A has a larger proportion of patients who disagree with this statement.

Table 70 shows the responses to the statement 'the physiotherapist is an attractive person'. There is little difference between the two sets of responses.

Table 71 gives the average increase in pulse rate in percentage terms which accompanied the touch and presence of the physiotherapist. There is little difference between the results for either physiotherapist and no significant difference existed between the sexes, $P < .20$, analysed on each physiotherapist independently. It is shown in Table 72 that a larger proportion of the sample treated by physiotherapist A achieved pulse rates in excess of 100 beats per minute with 2 men and 4 women as opposed to 2 men and one woman in the case of physiotherapist B. The measurement of peak pulse rates, using a two tailed 'T' test, showed a difference between the two parts of the sample, $P < .10$.

In the case of the GSR recording following five minutes massage by physiotherapist B, Table 73, all of the men and 6 of the women showed positive changes in the GSR with a significant difference between the sexes in the case of physiotherapist A.

Tables 74 and 75 give the recorded changes in the pulse rate for the patients treated by physiotherapists A and B as measured against their presence and touch, with the average change based on three recordings, shown in the final two columns.

The increase from the resting pulse rate which accompanied the presence of the physiotherapist showed a difference between the two

parts of the sample. The patients treated by physiotherapist A showed no significant difference between the sexes, while those treated by physiotherapist B showed a difference between the sexes, men $P < .20$, women $P < .10$.

In the case of the GSR changes there was also a difference between the two parts of the sample. When the patients treated by physiotherapist A were touched, there was no significant difference between their resting GSR and that recorded which was, in the case of men, $P < .20$ level, and for the women, $P < .10$. In the sample treated by physiotherapist B, both groups of patients showed a change which was significant at the $P < .01$ level.

The changes recorded in the GSR associated with the presence of the physiotherapist were the same for both physiotherapist A and B in the female section, $P < .05$ although there was a difference between the two male samples. Those treated by physiotherapist A showed changes $P < .20$, while those treated by physiotherapist B showed changes significant at the $P < .01$ level.

Discussion

From the results obtained it is apparent that significant changes in a patient's pulse rate do not accompany either presence or touch but for GSR do accompany both the presence and touch of the physiotherapist. In this experiment physiotherapist A produced no significant changes in the male patients, while physiotherapist B achieved the most significant changes in the male patients.

Physiotherapist A is ten years older than physiotherapist B, who in turn is a petite, attractive, blond-haired physiotherapist. This may account for the higher readings noted for her male patients. There was no significant difference between the rating of attractiveness for either physiotherapist, Table 70. It may be that the

experimental situation caused more stress for the younger physiotherapist who reported feelings of uneasiness during the experiment. It may be that these feelings produced physical signs which in turn evoked a protective response from the male patients, which might account for the results obtained.

It is clear that the presence of the physiotherapist is more arousing than her touch, although the men showed slightly more arousal, it was not at a significant level, $P < .20$ and the claim that massage is relaxing is not substantiated by this experiment.

Conclusion

This study set out to determine what changes in the patient's pulse rate and GSR, if any, accompany the presence and touch of the physiotherapist. It is clear that significant changes do accompany both elements of a clinical interaction although the two physiotherapists participating in the experiment produced different results for either sexes.

Further experiments need to be carried out with the variables more tightly controlled before any firm statements can be made. It is possible to hypothesise that the physiological changes produced in the patient, which accompany the presence and touch of the physiotherapist, may be one of the reasons why patients prefer physiotherapy treatment to tablets prescribed by the doctor.



Plate 20

A fairly typical family group, the ninety-two year old mother, the caring daughter and the family pet.

APPENDIX 11

SELECTION OF LETTERS FROM PATIENTS AND DOCTORS

(These are reproduced with the full
permission of the individuals concerned.)

BEWAC-PARKGATE

Holbrook Lane, Coventry 0203 -
TELEPHONE COVENTRY 83121

FLAT 4 PARKLANDS COURT
9 FELLOWS LANE
HARBORNE, BIRMINGHAM B17 9TP.

17-10-80

Superintendent
Physiotherapy Dept.

Mrs Lee, my Mother, is all
but immobile + can only walk
short distances with extreme
difficulty.

Maurice R Max-hino

Mrs M. R. Max-hino
(Daughter).

FOR ALL LEYLAND CARS

- ★ Usually over 400 new cars/vans for immediate delivery.
- ★ Part exchanges welcomed at very high allowances.
- ★ Very competitive credit facilities available.
- ★ Leyland employees welcome for first rate service and value.

know my husband & I will not become house-bound
as we have in the last six months.

Do please excuse my poor writing my hands
cannot hold a pen to well.

To your service & wonderful hard work of
Miss Price, we thank you so very much.

Yours Truly

Lina Burrows (Mrs.)

Northfield

B, Jan 31. 5. 11. H.

Nov 4th 1980

Dear Mr. Prager

I would like to tell you how very grateful
my husband & I are for the wonderful treatment
I have received from Miss Price. We just cannot
praise her enough, she truly is a very dedicated
worker. Having had arthritis for many years
I became very, ice induced in May, when Miss
Price came, I just could not move at all in any
way, after 13 weeks in bed, with not eating
a loss of weight, Miss Price started
to work on me & now with two sticks I can
walk about the house, get to the car & about
in the wheelchair your hospital & kindly sent
me. Without your wonderful service, I should
have become bedridden, something I have always
feared. Please keep up this excellent service
I would be honored to have had this



The Queen Elizabeth Hospital
Queen Elizabeth Medical Centre
Edgbaston Birmingham B15 2TH 021-472 1311 Ext

Please reply to: DEPARTMENT OF
PHYSIOTHERAPY

Your ref

Our ref BAB/ACT

28th October, 1980

Dear Mrs. Rollason,

I have verified that in the Central District ambulances cannot be ordered for G.P. referrals to physiotherapy.

I should be grateful, therefore, if you would take on this patient for domiciliary physiotherapy.

Yours sincerely,

(Miss) B.A. Bowen, M.C.S.P.,
Acting Superintendent Physiotherapist

Mrs. S. Rollason, M.C.S.P.,
Domiciliary Physiotherapist,
Physiotherapy Department,
Selly Oak Hospital,
Raddlebarn Road,
Birmingham B29

Birmingham Area Health Authority (Teaching)
Central Birmingham Health District

CB.4-78

Dear Sir's

67 Foredraft Close

Woodgate B.32.

My doctor advised me to take a course of physiotherapy, and arrangements were made for me to visit Selby Oak Hospital for same, transport by ambulance, Monday and Wednesday.

Having prepared myself and waited to be picked up on four of the dates, I felt most frustrated and annoyed when no ambulance arrived to take me. I feel I must register this protest as a M.S. sufferer, and hope that more publicity be given by the media, to this sad state of our ambulance service.

Yours Sincerely
 M^{rs} A. Y. Savage.

Tel.
021-449 2389

54, Paton Grove,
Moseley,

Birmingham.

B13 9TG.

9/16/80

Dear Margaret.

I was very upset when you said you were finished with one, but of course realize it is in one way good sign to think I no longer need you. Thank you for your great help & kindness at all times.

Thank you also for suggesting Moseley Hall I go to a week & Jan saw it will be her friend & it helps blue get just her 2 days free to go on with something else I hope all is well with you,

Janie S. Taylor,
Hilda Taylor

L.T.O.

Dear Margaret,

Thank you for helping Hilda. She enjoys going to M. Hall. & I am sure it is doing her good & gives me a break. I hope that you are well, do call & see us if you ever have time.

Kind regards,
Olive M. Collins

FIG. 81

Birmingham Accident Hospital

Bath Row, Birmingham, B15 1NA.

Telephone: 021-643 7041

Ext:

Our Ref: MMS/HVH/457360

Your Ref:

Birmingham Area
Health Authority (Teaching)

South Birmingham
Health District

21st December, 1978

S. Rollason,
District Physiotherapist,
Selly Oak Hospital,
Raddlebarn Road,
Birmingham, B29 6JD.

ABE 80

HUMERUS + COLLES

Dear Sue,

Re: Elizabeth Hornby.

Thank you for your letter and for treating Mrs. Hornby. I am sure most of the credit for this result is due to you rather than to me.

I would accept what she has got just now as being satisfactory for a woman of her age and I have not made a specific appointment here but I have told her husband that if there are any problems he should contact you or me directly at the Accident Hospital.

All the best for Christmas and the New Year, hope to see you sometime soon.

Yours sincerely,

Mr. M. E. Scott.
Team I.

Dear Sir

Could you please get someone to have a look at my Mother's Arm only she keeps on complaining that it hurts her, it is towards the Shoulder of her right Arm, we dont know if she hurt it when she fell over, when she had her stroke we would be very obliged.

On Monday my Mother should have been picked up and brought to the Hospital for her treatment, but know one came to fetch her, she waited for about 3 hours, which distressed her very much indeed, surely this sort of thing wont help her in anyway to recovery will it in fact it is doing her more harm than good because she gets all tensted up which is very upsetting indeed.

Thank You
 J Foster, Son in law
 on behalf of
 Mrs Jackson

4 MIDDLEFIELD HOUSE
DRUIDS HEATH

BIRMINGHAM 14

DEAR MRS BURRELL, & MR FRIZER.
TAKING THIS OPPORTUNITY OF THANKING
YOU BOTH SINCERELY FOR YOUR
KINDNESS & PATIENCE WITH ME.

ITS SO NICE TO SEE PLEASANT FACES
IT HELPS ~~ME~~ A LOT WHEN
YOU ARE IN PAIN, TO HAVE A
LAUGH & A JOKE, AND NICE RIDE
HOME (PRIVATE TAXI), I FELT LIKE
A PRINCESS, UNTILL HE ASKED FOR
FARE, I NEARLY DROPPED DEAD.
OH WELL ALL THE BEST TO YOU
BOTH SEE YOU SOON.

YOURS SINCERELY
GERTRUDE ELIZABETH
THOMPSON

2

Zimmer I cannot do without it
 at all. I have seen my G.P.
 about 4 times but he does not
 seem ^{to think} any thing can be done for
 me. I am quite well in myself
 that I get no depression when
 I cannot get out more and I
 have to depend so much on
 my daughter who is not able to
 have any social life because
 of me. She is the only one I have to
 do things for me. What I would
 like you to tell me. Mrs B would's
 share any hope of me getting any
 better in the future if you would not
 mind me asking. Enclose S.A.F. for
 me. Will you please call on
 Wincor yours Sincerely. Frances Torr

27 Theresia Rd
~~27 Theresia Rd~~
 Sparkbrook
 Birmingham 11

Dear Mrs B small

I do hope you exercise
 me writing to you but, I do not
 know who else I could ask who
 we'd understand how I feel about
 the position. I find myself in I hope
 you will mention me when I was
 in Ward M2. You were good to me
 and helped me in many ways untill
 I came out of hospital on August 10th
 last year. Well, what I am so
 worried about is I am not using
 different at all since when I came
 out I still have to rely on the

94 Linden Rd.
Birmingham B30 1LR
July 3-78.

Dear Mrs. Rollason

I felt I would like to write to tell you how your serene smile with my husband. Frank Brown, has benefited him, as you know he was admitted into hospital with a Ruptured Appendix & he was very poorly for a long time. But he was walking when he came out of hospital, although we have had bits of problems. He is now chasing himself, getting himself into his right positions in bed. Going to the toilet without help. He has lost a bit of weight. (He is just a stone now) But he is now eating better & in the whole has quite improved. Of course the funds

Walking a problem I still get the rums in his legs. But I feel that a bit of problems before was, because he had this appendix trouble without knowing it. Anyhow I felt I would like you to know that I think you helped him very much.

Yours sincerely
Jessie S. Brown

11. 9. 48,

Mrs. E. Murray,
11. Laurel Rd.
Kings Norton
Bham 30

Dear

Mr Grazer.

I am writing to you
to express our thanks for
Mrs. J. Burrell for all the help
she gave my husband to get him
on his feet, and also for her
kindness to him to help him
she had a wonderful patience
in everything she done, and I
am also thanking you and all
your staff who do very good
work.

Yours sincerely
Mr. Mrs. Murray

TELEPHONE:
021-444 2005

1 VICARAGE ROAD
KINGS HEATH
BIRMINGHAM B14 7QA

15/5/78

Dear Physiotherapist

Mr Harry Hopkins (75)

18 Queens Ave, Heathfield Rd. 14.

I was really amazed & pleased to see the progress in this patient since I last saw him 11 days previously. Since his return home from Queen E. Hospital in Dec '77 where he was treated for a hyperextended hip joint, he has been very weak on legs, very wobbly & lacking confidence. Today when I visited him he was walking up the entry with a Zimmer, fully dressed & relatively steady on his feet. This is after only one visit to your Physio Dept last week. Well done!

Yours sincerely
J. Brett

Sturport

Nov. 25

Shelton
Genevieve
Florence

Dear Mrs. Burrell
Just a few lines hoping
that you both are keeping O.K.
as it leaves me fairly well
at the moment. I had a lovely
holiday at Bournemouth the
weather was grand. The only
thing was I could not walk
for so I had stay at the
hotel all the time.

Enclosed you will find a
photo of the shell house -
it is beautiful to see it.
The Dr. has sent me some
as I have had it so long
on my chest, so I am hoping

They will do me good,
that you had your holiday,
yet, if so I hope you are
enjoyed them. If you are
calling down that way, try &
call in, I should like to have
a chat with you again.
Also I could get some
booklets for you. I think I have
nothing to say. So will
close no chance for news
your respectful
Henry Wainport

33^B Beaubury Rd
Northfield

Dear Mr Fraser.

I thank you very much for the kind and skillful way you have treated my wife the past few weeks. As regards the 2 sessions she missed was due to a typing error. The first time our number being 33^B was read as 339, or so I was told. The second time that the ambulance was full, which was hard to believe

Yours Sincerely
W^m P. Stanley

DR. L. FIRTH
AND
DR. A. KLEIN
TELEPHONE: 427 1273
CONSULTING HOURS
9—10 A.M.
5—7 P.M.
(EXCEPT WED. & SAT.)

60, FELLOWS LANE,
HARBORNE,
BIRMINGHAM,
B17 9TP.

27.7.78

Physiotherapy Dept.
S.O.H.

Dear Mrs. Robinson

Thank you very much for your letter regarding Mrs. Smith and I am enclosing the assessment chart.

You did a marvellous job. Mrs. Smith has lost her shoulder + neck troubles and is now walking and able to leave her home. What more following your visits she is mentally more alert + enjoying life.

Thank you very much for your help

Yours sincerely
A. Klein

16 CHELSEY GROVE

NARSTOCK

B'HAM 14 AUG.

Dear Sir Madam

On behalf of
the wife and myself, I would like
to thank you very much for the
Physiotherapy treatment which we
gave at home. By Mrs. J. M. Buwell,
who is doing a grand job.

This takes away the
worry of the wife, who, was worried
when she had to wait for the
Ambulance, to bring her home, which
would take away the benefit of the
treatment, as she had just received,
whereas treatment at home makes

4. The wife more relaxed, and
responding, better to the
treatment which she now receives.

Hoping that this service
continues especially during the
winter when, it is cold for the
patients to leave a warm house to
go out in the rain, snow, or very cold
winds

Yours,

W. L. Welch

help, & even at 66 years of age it is grand to know my husband & I will not become housebound as we have in the last six months.

No please excuse my poor writing my hands cannot hold a pen to well,

To your service & wonderful hard work of Miss Price, we thank you so very much.

yours Truly

Edna Burrows (Mrs.)

27. Furren Road

Northfield

B. Rom 31. 5. H. H.

Nov 22 1980

Dear Mr. Krager

I would like to tell you how very grateful my husband & I are for the wonderful treatment I have received from Miss Price. We just cannot praise her enough, she truly is a very dedicated worker. Having had arthritis for many years I became very ill indeed in May, when Miss Price came, I just could not move at all in any way, after 13 weeks in bed, with not eating & a loss of weight, Well Miss Price started to work on me & now with two sticks I can walk about the house, get to the car & that in the wheelchair your hospital so kindly send me. Without your wonderful service, I should have become bedridden, something I have always feared. Please keep up this excellent service & I feel so very pleased to have had this

Highbury 3777

March 1st. 1981.

12 Colmore Avenue
Kings Heath
Birmingham 14
B14.6AA.

Dear Sir :

Will you please advise Mrs. M. Mc Garry, the Community Physiotherapist not to come again to give me treatment for my chest complaint?

She should have come last Wednesday, but did not turn up, or on Thursday or Friday. She is very efficient and does her work well, but I cannot stand the pummelling to fetch the phlegm away.

I am 83 housebound and very deaf. If I were younger it would be different.

Dr. Harrison who comes to your clinic each Friday afternoon would understand, but I am not due to see him again until May 1st. of this year.

When Mrs. Mc Garry goes after giving me treatment, I feel as though I have been in a fight, with me the loser.

Yours truly,

A. M. Rus

Physiotherapy Department,
Selly Oak Hospital,
Raddlebarn Road,

Selly Oak.
Birmingham
B29 6

LETTER FROM DISSATISFIED PATIENT

APPENDIX 12

BODIES REQUESTING INFORMATION AND ADVICE

Bodies Requesting Information and Advice

- John Acres, Hampshire Area Health Authority.
- Mrs B Bennet, Barnes Hospital, London.
- Mrs G Dixon, Research Physiotherapist, Department of Physical
Medicine and Rehabilitation, Mount Vernon Hospital.
- Mrs H Haywood, District Physiotherapist, Sheffield Area Health
Authority.
- Miss F Hill, Research Physiotherapist, Trent R.H.A.
- Miss N Hughes, District Physiotherapist, Clwyd Health Authority,
Wales.
- Mr P Key, Deputy District Administrator, Hereford Health District.
Librarian, Kings Fund Centre, London.
- Mrs H Lloyd, Physiotherapy School, Dalhousie University, Halifax,
Nova Scotia.
- S P McDonald, Assistant Secretary, Greater Glasgow Health Board.
- Miss L van de Meene, Advisor in Physiotherapy, Department of Health,
Brisbane.
- National Corporation for the Care of Old People, London.
- Dr W Nicol, Area Medical Officer, Birmingham Area Health Authority.
- Northern Ireland Health and Social Services Library, Queens University,
Belfast
- M D O'Brien, Administrator, Worcester Health District.
- Dr J Ross, Department of Haematology, East Birmingham Hospital.
Department of Social Administration, University of Manchester.
- C H Tedman, District Physiotherapist, Canterbury and Thanet Health
District.
- Dr N Vetter, Director, Research Team for the Care of the Elderly,
Welsh National School of Medicine.
- Rosemary Walker, District Physiotherapist, Barking Hospital, Essex.
- Dr K Taubert, UFAES, Strasse 26, West Germany.
- Dr H Tauchmannova, Piestany, Czechoslovakia.
- Miss M J Kennedy, Area Physiotherapist, Northern Health & Social
Services Board, Newtownabbey.

Miss A Frost, District Nursing Officer, Hereford District.

Mrs A Faulkner, PRO, Help the Aged, London.

Clwyd Health Authority, North Wales.

Mrs M Tomkins, Planning & Information Services, Worcester Health District.

The British Library, Lending Division, Boston Spa, Wetherby.

Barnes Medical Library, University of Birmingham.

Dr J Mercer, North East London Polytechnic.

Professor M Warren, Health Services Research Unit, University of Canterbury.

Mrs M E McGonigie, Community Nursing Sister, Worthing.

Mr W J Moot, Lecturer, University of Cape Town, SA.

D P Chapman MCSP, Private Practitioner, Heathfield, Sussex.

A Pearson MCSP, Warrington District General Hospital.

N Z Wallis, Deputy Superintendent Physiotherapist, Addenbrookes Hospital, Cambridge.

Department of Community Medicine, University of Aberdeen.

Institute of Gerontology, University of Michigan, USA.

Hector Larrea, Co-ordinator, Centro de Rehabilitacion, Hospital Italiano, Buenos Aires.

Dr D P Boldy, Institute of Biometry & Community Medicine, University of Exeter.

Dr G B Smith, Barnsley Area Health Authority.

Postgraduate Medical Centre Library, Salisbury General Hospital, Wiltshire.

The British Council, 10 Spring Gardens, London SW1A.

Scottish Health Education Unit, 21 Lansdowne Crescent, Edinburgh.

The Sports Council, West Midlands Region, Birmingham.

D.H.S.S. Library, London.

APPENDIX 13

LIST OF PUBLICATION ARISING FROM THE STUDY

List of Publications Arising from the Study

- "Developing a Future in Management Structure."
Therapy, July (1978)
- "Community Physio : A New Colleague for the District Nurse."
Nursing Mirror, October (1978)
- "Disability and its Prevention : The Physiotherapist's Role."
Therapy, September (1978)
- "Challenge of Domiciliary Physiotherapy."
Therapy, November (1978)
- "Acting Out the Wrong Role?"
Therapy, February (1979)
- "Coping in the Community."
Therapy, May (1979)
- "GP Direct Access Cuts Waiting Time."
Modern Medicine, vol.24, no.5, (1979)
- "Physio on Wheels."
Therapy, May (1979)
- "Home Truths About Physios."
Therapy, July (1979)
- "Assessment of Elderly Patients."
Physiotherapy, 65, 7 (1979)
- "A Career of Exciting Challenge."
Therapy, October (1979)
- "Domiciliary Physiotherapy - Cost and Benefit."
Physiotherapy, 66, 1 (1980)
- "Round the Clock Physiotherapy."
Therapy, June (1980)
- "The Professional Touch."
Therapy, November 6 (1980)
- "The Home Treatment of Strokes : Cash's Neurology for Physiotherapists."
Faber & Faber, London (1981)
- "Counting the Cost of the Physiotherapist."
Therapy, September 4 (1980)
- "Physiotherapy in the Geriatric Hospital - A Second Class Service?"
Tripod, No.4. Spring (1981)

APPENDIX 14

PUBLISHED ARTICLES RESULTING FROM THE STUDY

TREATMENT NOTE

Persistent Post-sympathetic Pain Treated by Connective Tissue Massage

F W FRAZER BA MCSP

District Physiotherapist, Selly Oak Hospital, Birmingham

SEVERE and intractable pain occasionally develops following neurosurgical procedures, some being described as reflex sympathetic dystrophy. This report describes various methods utilised in an attempt to relieve such pain.

Case Report

A 45-year-old female physiologist had suffered from Raynaud's syndrome, which affected all four limbs, since 1969. From that date, over a period of four years, she had all four limbs sympathectomised, producing a good improvement to the peripheral circulation of her fingers and toes.

Late in 1973 she developed severe and intractable pain in the left arm and had the wound re-explored. Scar tissue and a section of the intercosto-brachial nerve was excised giving only temporary relief. In May 1974 she had a posterior rhizotomy which provided relief for five weeks. Her pain then began to return, involving both arms and extending to the side of the chest. The patient also complained of tingling and a hot feeling running down the inner aspect of the forearm, radiating to the third, fourth and fifth fingers of both hands.

Since that time she has undergone various procedures in an effort to eradicate her pain. To date she has had a course of cervical epidural injections with Marcaine and local steroids. An attempt at transcutaneous electrical

stimulation was unsuccessful and one intravenous regional guanethidine block to her left arm provided relief lasting 48 hours. A course of eight acupuncture treatments was ineffective but she obtains some relief from pethidine tablets.

During this period she has received physiotherapy on a regular basis. For one month some of the procedures used on the patient were assessed as to their efficacy with the aid of a pain measuring device, the 'pain thermometer'.

Pain Thermometer

As can be seen, the pain thermometer, developed by Joyce (1966), provides a visual analogue scale which is easy to read and which includes a condensation of the whole range of subjective expression of pain. Research has shown that people can discriminate about 22 increments of intensity between threshold pain and pain of maximum intensity. The pain thermometer has been used extensively in the community physiotherapy project in the South Birmingham Health District (Frazer, 1975) and has proved consistently accurate in measuring the effects of treatment.

Research by Melzack and Torgenson (1971) showed that language is important in describing the pain experience and although psychophysics has been useful in laboratory investigations into the measurement of pain, no matter how sophisticated the stimulus-giving equip-

SOUTH BIRMINGHAM HEALTH DISTRICT
COMMUNITY PHYSIOTHERAPY

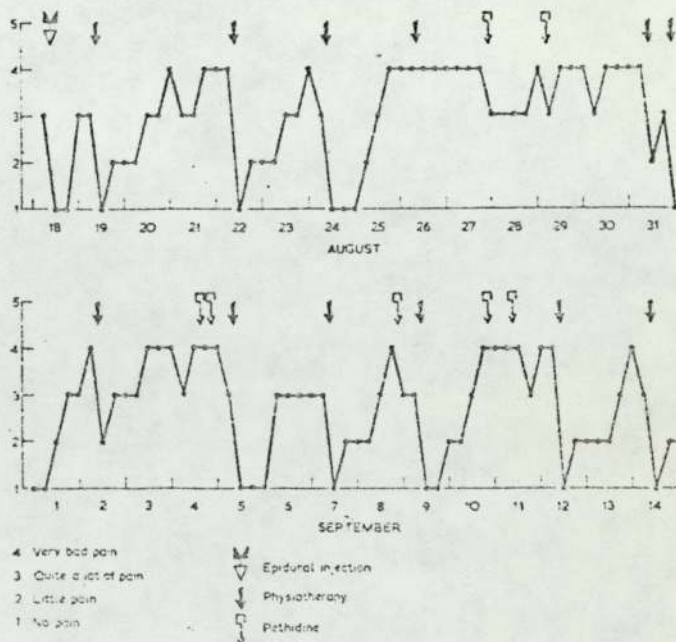
MRP Surname	Forenames
ADDRESS	
National Health Service Number	Date of Birth



Signed _____

Fig 1 (above): Pain thermometer chart

Fig 2 (right): Pain thermometer readings, August 18 to September 14



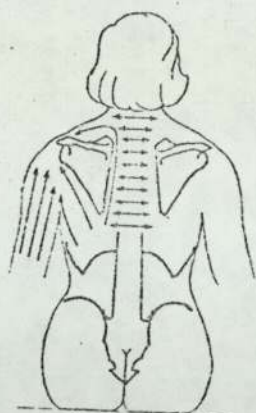


Fig 3 (a): Connective tissue massage — 'long' strokes

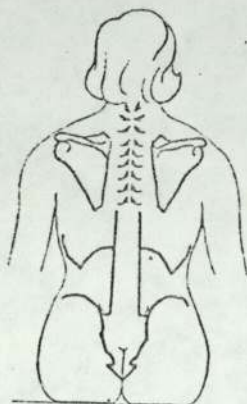


Fig 3 (b): Connective tissue massage — 'short' strokes

ment may be, subjective response is the vital measure. Lasagna (1958) thinks that, for reliability, no other measure can approach verbal report. With the use of physiological methods of pain measurement, there are difficulties of interpretation as it can be uncertain whether a recorded response is due to pain alone and most techniques require a subjective response as a dependent variable.

Because it has yet to be demonstrated that any more accurate results can be obtained from any method other than the patient's verbal report, the pain thermometer has been chosen as a measure of a patient's experience of pain.

The patients are presented with the pain thermometer and asked to identify the point on the scale which they feel most accurately reflects their pain. In the case of the patient described above, she completed one of the illustrated forms each day for four weeks, placing the completed form in an envelope at the end of 24 hours and sealing it so that each subsequent reading would not be influenced by those preceding it. At the end of the month, the measurements were transferred to a graph (fig 2, previous page).

Connective Tissue Massage (CTM)

This is a specialised massage technique which has been taught for many years by Miss M Ebner MCSP (1962). The patient is usually treated in the sitting position and the massage is applied by the operator using a relaxed hand and placing the second and third fingertips on the patient's skin at an angle of between 40° and 60°. The hand is held in ulnar deviation with the metacarpophalangeal joints slightly flexed. The stack in the skin is

taken up lightly and the fingertips are drawn along the area chosen for treatment.

Two types of stroke are used in the treatment, long and short. The long stroke is shown in fig 3(a), the short in 3(b). The fingers travel in the direction of the arrows and the stroke is a short twisting movement of the fingertips. The short stroke produces fewer side effects in the patient.

The sensation produced varies from a slight scratching to a feeling of red-hot needles and can be modified by the speed of the stroke and the angle at which the fingers are held. The effects produced include a marked hyperaemia and a feeling of heat which lasts for six hours or more. The sweat glands are stimulated and bruising is often evident on the day following treatment. The extent of this varies according to the fragility of the patient's capillaries and is unimportant.

It is claimed that the massage stimulates the mast cells to release a histamine-like substance which acts on the autonomic nervous system and indeed, in many cases, fainting can result from this treatment. For the patient described above a heavier pressure is used than would normally be required.

In spite of the sophisticated processes carried out in an attempt to relieve this patient's pain, none have proved any more effective than CTM. This treatment is given two or three times each week in the physiotherapy department, the treatment period being no more than 20 minutes on each attendance. The treatment is quick to apply and has no harmful side-effects, no equipment is required, it is relatively inexpensive and produces consistent results.

As can be seen from the graph of results, physiotherapy treatment is as effective as the epidural injection in producing a complete relief from pain and is more effective than pethidine. It is not altogether certain how this treatment succeeds in this instance although counter-irritation, an effect noted by Hippocrates, may be involved (Adams, 1859). Adherents of the gate-control theory might suggest that physiotherapy simply closes the 'gate' (Melzack and Wall, 1965). It is possible that the slightly traumatic effect of this form of massage could stimulate the release of enkephalin in the central nervous system which would result in pain relief. It is proposed to carry out a controlled trial of this type of treatment using electro-encephalography and blood sampling to determine the physiological response to the connective tissue massage.

ACKNOWLEDGEMENT

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TREATMENT NOTE

Assessment of Elderly Patients

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A MULTIPLICITY of pathological processes is usually present in the elderly (Cairst, 1976), and patients in this age group show considerable daily variations in their physical condition and in their levels of perception.

Many comprehensive systems of assessment available to the physiotherapist are bulky and require considerable time to complete. When such systems are used there is no guarantee that the doctor will give more than cursory attention to the wealth of material they may contain.

What seems to be required is a system of assessment which is quick to apply and easy to read but which will present a reasonably accurate reflection of the patient's state.

The system described below was developed during the course of a study of domiciliary physiotherapy within the South Birmingham Health District, and is used by both doctors and physiotherapists.

PHYSIO Assessment Card

This card is used to assess the patient's condition, before and upon completion of the treatment course. It is designed to fit the patient's NHS envelope which is kept at the doctor's practice.

It is self-evident that such an assessment, on its own, is inadequate to reflect fully all changes in the patient's condition. Nevertheless the card provides a guide to the patient's condition which is quick to complete and is easily understood. Generally a decrease in the score on any element on the card reflects an improvement in the patient's condition. Provided the results are supported by other measurements, such as the assessment grid, the PHYSIO card can act as a reliable indicator of the patient's physical state. The form is loosely based on the PULHEEMS system used by the British Army (McNally, 1961), and the PULSE system used by the American Army (Moskowitz and McCann, 1957). In both Forces these systems are used to record details of the soldier's health. A similar system was adapted and used in this District because of its inherent simplicity and speed of completion.

The choice of the acronym PHYSIO was deliberate, because of the need in the early days of the study to publicise the service. It is the familiar contraction for the word 'physiotherapist' and readily lends itself as a basis for the various sections of the assessment.

As can be seen (fig 1), the form is divided into six sections, covering all areas of the body, including other elements such as 'pain', 'balance', 'mobility' and 'incontinence'. There are four degrees of abnormality ranging from no abnormality to severe abnormality, with 'minor abnormality' and 'moderately severe abnormalities' as the intermediate measures. The qualifying distinction between the two intermediate grades of abnormality is that a 'minor abnormality' is likely to be tolerable to the patient, whereas a 'moderately severe abnormality' is likely to cause the patient to seek attention.

P: Pain. This section covers pain irrespective of how or where it presents.

H: Head, shoulders, upper limb and trunk. This section includes all of the areas mentioned.

Y: Mobility, including pelvis and lower limbs. Poetic licence has been invoked, as the last letter of the word was used in this instance. This section also includes the lower limbs.

S: Stability, balance. This section covers stability, both static and dynamic.

I: Incontinence. This section covers both bladder and bowel function.

O: Other. This section covers all other areas, including the mental state.

The method of scoring is straightforward, the two extremes — 'no abnormality' and 'severe abnormality' — rating a score of 1 and 4 respectively. The two intermediate states of abnormality are scored 2 and 3 respectively. A score of 2 reflects a minor abnormality without any functional deficiency, whereas a score of 3 shows a functional loss.

COMMUNITY PHYSIOTHERAPY							
PATIENTS NAME.....		AGE.....		SEX.....			
ADDRESS.....							
.....							
	P	H	Y	S	I	O	DATE
ASSESSMENT ON FIRST VISIT							
ASSESSMENT ON SECOND VISIT							
DOCTOR.....							
PHYSIOTHERAPIST.....							

Fig 1: PHYSIO assessment card. The significance of the letters and the 1 to 4 grading are explained on the reverse side of the form.

Assessment Grid

The assessment grid (fig 2) is an adaptation of a similar grid, described by Williams (1975), and in the case of the elderly patient is used to make a functional assessment. The grid embodies two measures: the top line grades the patient's state and is labelled 'distress', while the vertical scale is labelled 'disability' and assesses the patient's functional state in terms of activities of daily living. The classifications used are simple and the grid can be quickly completed.

Distress Classification

This scale is sub-divided into three grades: 1. None; 2. Moderate; 3. Severe. It reflects the distress felt by the patient with regard to his physical condition and, at the same time, provides a fairly accurate measure of his mental state.

Disability Classification

This scale is divided into eight sections:

1. *No disability.*
2. *Independently mobile.* Mobile outside the home and can do light shopping as well as household tasks.
3. *Limited mobility.* Can walk outside the home with the aid of a stick or walking aid, but cannot carry shopping. Able to perform light household tasks.
4. *Housebound, able to do light housework.* Cannot move around outside the home without the help of some other person, or the use of a wheelchair. Able to perform some light housework, perhaps using the furniture as support for moving around in the house.
5. *Housebound, limited to self-care activities.* Confined to the house and unable to perform light housework. Can wash, dress and feed himself.
6. *Housebound, requiring help with self-care activities.* Confined to the house and requires help with self-care activities.
7. *Chairbound, requiring help with self-care activities.* Mainly confined to a chair, but may be able to transfer independently from bed to chair. Requires help with all self-care activities.
8. *Totally dependent.* This assessment is applied to a patient who is confined to a chair or to bed and who cannot move from one to another without help. Requires full-time help with all activities.

Thus the scale ranges from 'no disability' to 'totally dependent', two extremes common to most methods of assessment of disability. The intervening parameters have been selected to indicate most accurately slight changes in functional capacity in patients aged 65 and over. The intervals chosen are related to function and take no account of disability or of pathological condition. This is useful since it shows the slight changes in functional ability which can often be achieved with treatment, but are unrelated to any changes in the physical condition of the patient.

Combined Scales

This system of assessment entails a matrix of 24 possible states.

The patient is assessed before the treatment course begins and again upon completion. A general movement upwards and to the left should be observed, if there is any improvement in the patient's condition.

COMMUNITY PHYSIOTHERAPY ASSESSMENT GRID			
NAME.....		AGE.....	
ADDRESS.....			
.....			
.....			
: DISTRESS			
	1	2	3
DISABILITY	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
DOCTORS SIG.....		DATE.....	
PHYSIOTHERAPISTS SIG.....		DATE.....	

Fig 2: Assessment grid. The classifications are listed on the reverse of the form

The grid has proved a useful adjunct to the PHYSIC assessment when used to determine a patient's physical and functional capacities and during the course of the present study of domiciliary physiotherapy it has been used with over 400 patients (Frazer, 1979). The main advantages of the two systems are that they are quick to complete, cheap to produce, and easy to read. They also produce a reasonably accurate reflection of the elderly patient's condition, without being so detailed that small changes in the patient's state, described in the opening remarks, will distort the assessment.

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CONGRESS LECTURE

Domiciliary Physiotherapy — Cost and Benefit

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RECENTLY, throughout the country, there has been an upsurge in growth of domiciliary physiotherapy schemes, and those physiotherapists who for many years have advocated such a service are beginning to see some results for their efforts.

Sharman (1972) describes the type of domiciliary rehabilitation service, common in North America, which operates on the premise that restoring persons to either full capacity or to a certain degree of independence is one of the best investments there is. He pointed out that in the UK inadequate remedial services did not excite doctors, politicians or the authorities, and went on to say that inadequate rehabilitation services merely pass on their unfinished business, the patients concerned becoming problems for social services departments, or swallowed up in the community and forgotten.

In an interim report in October 1973 the Chartered Society of Physiotherapy Working Party on Community Physiotherapy stated that there was a great need for a non-hospital physiotherapy service. Wilkes (1975) drew attention to what he described as a tremendous and genuine need for physiotherapists in the community, going on to compare the standard of care that existed in hospital with that in the community. After 25 years of the National Health Service the concentration of care in a largely hospital based service had produced a levelling up of the standards of hospital care without any levelling up of standards within the community. The result was that care tended to be worst where the need was greatest. Pioneering work in the Southampton area (Compton, 1973) demonstrated the viability of a domiciliary physiotherapy service, and a recently published report by Partridge and Warren (1977) describes the availability and the scope of community physiotherapy services in 14 Health Districts. In some areas the growth of domiciliary physiotherapy services has been stimulated by funding provided jointly by the social services and the NHS. This growth has led to an increase in the number of requests from existing primary care staff within the community.

The evaluation of a domiciliary physiotherapy service to the elderly currently being carried out within the South Birmingham Health District, began in 1977. This evaluation resulted from observations made of the ambulance service to the physiotherapy department at Selly Oak Hospital during the preceding seven years. They showed that 10% of all ambulance journeys to the department were cancelled without any prior notice. Often the first indication of such a cancellation was a telephone call from the unfortunate patient. These cancellations usually involved the patients described as 'two-man lifts' and the same group of heavily disabled patients and their relatives were subjected to additional stress because they did not know whether they would be collected for treatment or not.

These cancellations also caused extra work for the clerical staff in dealing with telephone calls, often irate, and in re-booking appointments. There was also disruption to the day-to-day working of the physiotherapy staff within the out-patient department.

It was also noted that a visit to the hospital requiring ambulance transport could involve patients in waits of many hours which, if they were elderly could prove detrimental to their condition, a fact observed upon by Beer (1974). Indeed many of the elderly patients referred for physiotherapy treatment were too infirm to undergo the strain of an ambulance journey to the hospital.

Now that domiciliary physiotherapy is firmly established either because of demand from the community or because of an inadequate ambulance service, it is reasonable to ask whether there is a need to subject such a service to a detailed cost benefit analysis. If public demand were to be the sole criterion by which resource allocation is determined, then the answer would be no, since an ideal society would actively seek to provide those services necessary to ensure maximum welfare to its members, regardless of cost. Unhappily we do not live in an ideal society and there are many constraints upon the provision of services; physiotherapy is just one, among many, competing for limited financial resources.

Cost Benefit Analysis

If a decision needs to be made whether to provide a particular service, the cost-benefit approach requires that the service should only be provided if the derived benefits exceed the cost, both costs and benefits being enumerated and valued in money terms.

The basic rule is, Maximise (Benefits — Costs). Pearce (1978) suggests a formula for cost benefit analysis:

$$\text{MAX} \sum_t \frac{B_t - C_t}{(1+r)^t}$$

B_t and C_t are benefits and costs in time period t , r is the discount rate and T is the time horizon.

When costs or benefits occur at different points in time they are usually expressed as an equivalent sum of money at a single point in time, normally the present. This single sum of money is referred to as the present value and the varying rate of exchange between sums of money at different points in time is known as the discount rate. Thus there are two stages to a cost-benefit analysis of any service:

1. Measurement of all inputs and outputs by the same yardstick, ie money.
2. If $B > (C + C_0)$ where C_0 are unknown costs, then provide the service. This approach is undeniably simple in theory but in practice is fraught with difficulty.

Until now, comparatively little work has been undertaken regarding the cost-effectiveness assessment of medical treatment in general, and physiotherapy treatment in particular. The question being asked here is: 'What is the value of physiotherapy treatment?', and to answer this question a clear measurement of the true unit of output or achievement is required.

This immediately gives rise to difficulties in deciding what are appropriate indicators of output and by what method of measurement they can be assessed for a cost-benefit analysis.

In the case of the younger patients it is clearly easier to decide upon a criterion for assessment purposes such as time off work, or time taken to return to work following a course of physiotherapy treatment. Such measurements are relatively easy to obtain and can be readily compared with 'no treatment' groups.

In the case of the elderly patient, it is much more difficult to measure achievement as many of the results of treatment are concerned with an improvement in the quality of life or the ability to cope, rather than in any dramatic change in physical condition. In certain cases it is the relative who experiences the greatest benefit from a visit by the domiciliary physiotherapist.

Measurements

There are two main areas of measurement:

1. Costs, including unknown costs.
2. Benefits.

Costs

As can be seen from table 1, the measurement of costs is relatively straightforward. All costs known to be associated with physiotherapy treatment are detailed. There will be certain costs which are not immediately apparent and, in this particular example, such costs are listed under research costs.

There is little difficulty in obtaining costs for treatment, travelling and waiting times, telephone, postage or equipment. There can be problems in the areas of supervision costs and opportunity cost although in both instances it is possible to make an acceptable estimation.

Opportunity Cost

Opportunity cost is the value of what is given up by doing one thing rather than another and, in the case of domiciliary physiotherapy, there is clearly identifiable opportunity cost. Staff involved in the community spend part of their working day in travelling and cannot maintain as high a volume of output as their hospital based colleagues. There is room for argument here, as it has been observed that the domiciliary physiotherapy treatment requires less actual treatment time than the hospital based equivalent.

Table 1: Cost comparison of domiciliary and hospital physiotherapy

Activity costs	Domiciliary Treatment	Total cost £	Hospital Treatment	Total cost £
Treatment Time	1002.0265 hours	2456.96	170 hours	416.94
Waiting Time	Nil		32.8 (physiotherapy)	80.50
Travelling Time	339.09 hours 7349.76 miles	831.45 1080.41	238 hours (patient) 1900 miles (ambulance)	2280.00
Uniform		43.75		16.25
Telephone	1137 calls of 2.7 mins at 3p	125.50 34.11	163 calls of 2.7 mins at 3p	17.98 4.69
Postage	1046 at 7p Time	73.22 213.82	149 at 7p Time	10.43 30.52
Clerical	87 hours at £1.1833	103.02	12.5 hours at £1.1833	14.79
Stationery		60.93		8.71
Supervision Administration		501.37		71.60
Opportunity Costs		680.55	Nil	
Buildings	Nil		9866 sq ft at £1/sq ft pro rata	63.55
Research Costs		1641.24		229.63
Visits		107.27		15.32
Teaching		26.00		3.00
Equipment		1137.50		162.50
Meetings		107.27		15.32
Refreshments				29.55
Portering				93.60
Total		9224.37		3565.03
Cost per Treatment		6.55	Cost less £6.52 (ambulance)	18.09

Table 2: 1975 Projections of the elderly population 1975-2001 (UK)

Age group	1975	1981	2001	Percentage change 1975-2001
60-65	3,178,000	2,931,000	2,735,000	-13.9
65-69	2,831,000	2,759,000	2,411,000	-14.8
70-74	2,213,000	2,345,000	2,137,000	-3.4
75-79	1,447,000	1,664,000	1,733,000	+19.8
80-84	822,000	936,000	1,075,000	+30.8
85 and over	515,000	550,000	752,000	+46.3
Whole population (all ages)	56,043,000	55,911,000	58,345,000	+4.1

(Source: Government Actuary's Department and Office of Population Censuses and Surveys)

In the case of domiciliary physiotherapy, costs are incurred at a number of different levels. The initial day-to-day running costs are borne by the Health District.

Health District costs. These include salary, superannuation, uniform, transport, disposables, stationery, telephone, postage, clerical, supervision, opportunity costs, visits, teaching, equipment, meetings and unknown costs which can include anything from coffee breaks to research costs.

Community costs. With the presence in the community of a new service additional costs are incurred by GPs, health visitors, district nurses and social workers. The GP costs include referral times, telephoning, postage, visits and meetings.

DHSS costs. Ultimately all costs for any health care devolve upon the DHSS. These costs include all of the above plus the cost of providing suitable premises for health care. With domiciliary physiotherapy these building costs are minimal and this item is in fact included under the 'benefit' heading at a later stage.

Physiotherapy staff costs. Within a domiciliary physiotherapy service, a number of costs are incurred by the physiotherapy staff. The major cost is provision of suitable transport. This can involve buying a car, insurance, tax, servicing and maintenance, for which the staff receive a car user allowance plus traveling expenses.

There is a further cost which, at present, can be expressed only in non-monetary terms, which is the physical and mental effort of dealing with traffic delays, rush-hour city driving, parking difficulties and indecipherable addresses. Although, taken individually, these are relatively minor problems, there can be a cumulative effect which, in certain instances, can lead to psychological strain (Frazer, 1979b).

Patient costs. Patients' costs are associated with the visit of the domiciliary physiotherapist. These include such items as the use of the home as a treatment area, use of electricity, soap, water and towels, some element of opportunity cost and often provision of refreshment for the physiotherapist.

Measurement of Benefits

There are identifiable benefits accruing from a domiciliary physiotherapy service which, as in the case of the costs, can be considered under separate headings.

Health District benefits. These include fewer hospital admissions, saving on capital building programmes, saving on the time of porters and helpers, earlier discharges from hospital, favourable publicity.

Community benefits. Saving in GP time, assistance to district nurses, saving in reduced GP referral to consultant clinics, and strengthening the community team come under this heading.

DHSS benefits. These include reduction in demand on ambulance service, maximum use of facilities and resources, and improved level of service to a previously deprived group of patients. The last item is of considerable significance in view of the projected rise in the elderly population (table 2).

Physiotherapy staff benefits. The challenge of the work provides a stimulus and it confers an enhanced status as a professional person whose opinion is frequently sought by medical and other professional colleagues. The physiotherapist is aware that the service is filling a need in the community and helping to solve problems at first hand. She is able to improve the quality of life of many elderly patients in their own homes, and has high job satisfaction (Frazer, 1978).

Patient benefits. These include privacy of treatment area, no journey to treatment, no waiting for bus or ambulance, no fares, earlier and often more relevant treatment, and involvement of relatives in the treatment programme. The major benefit is an improvement in the state of health as a result of physiotherapy treatment.

Value of Health

Patient benefits will vary between individuals and may be difficult to identify. In general terms the value of health to an individual is the ability to lead a full life and it is possible to construct a scale, ranging between perfect health and death, on which the state of health of an individual can be estimated and costed.

PERFECT HEALTH ————— DEATH

There are many difficulties in assessing the value of life, or even of different health states, and this is possibly why health care has fought shy of cost benefit analysis.

There are guidelines for determining the value of life; in

court awards, human life is valued at anything between £500 and many thousands, depending upon certain contributory factors. Compensations for pain and suffering or disfigurement are usually a fixed sum and although there can be variations, tend to be around £500. These awards are on an unofficial scale, built up through previous judgments and are obtained from reports in the monthly journal *Current Law*.

Arguments abound regarding the relative values of varying states of health and a number of approaches can be adopted in the valuation of health states but elements of two have been selected for use in the current study of domiciliary physiotherapy service to the elderly in the South Birmingham Health District (Frazer, 1979). These are 'Consumer Sovereignty' and 'Human Capital' approaches.

Consumer Sovereignty

This approach is based on the contention that the individual who is affected by any project is considered to be the best judge of its value. Thus, in the case of domiciliary physiotherapy, an attempt must be made to determine what value each patient would place on the benefit he experiences as a result of his treatment.

A major problem with this approach is that a presumption must be made that the individual is capable of making the necessary judgments involved and is also able to decide which are the appropriate factors supporting those judgments.

As decisions regarding the type of treatment provided are usually left to the medical profession it might also be argued that the recipient has little say in how it is delivered or what its value might be. However health policy is ultimately decided by the appropriate Minister who in turn is elected by the consumer and his judgments may reflect the wishes of the consumer, up to a point.

Therefore, it is considered that the patient is an appropriate judge of his own state of health. There are exceptions in the case of the very young and the mentally

Using such an approach, it is often impossible to place a monetary value on all of the benefits likely to be derived as a result of any particular decision. In these cases such benefits are described as 'soft benefits' and are listed but not valued in monetary terms.

Inputs to human capital are mainly financed by the state, as is the case with the NHS and the money spent on health care could be said to reflect the attitude of the consumer who if left to his own devices might tend to spend too little rather than too much. The human capital approach values life in terms of the value of labour and utilises certain data concerning lifetime earnings, participation in the labour force and mortality rates to give an estimate of earnings for any age group. Projected earnings are discounted to present value terms for the purposes of cost benefit analysis.

Using this approach, Dawson (1976) estimated the value of life at £7,880. The retired individual, using these estimates, at that time had a human capital value of zero and if the sole goal of society was to maximise the Gross National Product, help would be refused to the old and treatment denied to any non-producer.

Subsequently it was appreciated that even non-producers were also consumers, and society did benefit from their consumption, so the human capital approach was extended to include the value to society of the consumption of each individual member. The human capital approach is reflected in the statement, described earlier, by Sharman who suggested that rehabilitation was one of the best investments available.

South Birmingham Study

The study currently under way in the South Birmingham Health District is not expected to be completed until the end of 1980.

So far, certain information regarding the cost effectiveness of a domiciliary physiotherapy service is available, based on a sample of 400 patients (table 3). As can be

Table 3: Age, sex, total sample

Age (years)	0-64	65-69	70-74	75-79	80-84	85-89	90+	Total
Men	15	28	33	27	14	8	5	130
Women	19	31	49	53	64	36	18	270
Total	34	59	82	80	78	44	23	400
%	8.5	14.75	20.5	20.0	19.5	11.0	5.75	100

handicapped as well as some elderly confused patients and in such cases expert opinion must be sought.

One final problem with this approach is created by the difficulty experienced by most patients in attempting to state in monetary terms what the value of their present state of health should be. Culyer (1971) suggests that 'state of health indicators' might be used with relative weights attached to pain and restriction, remarking: 'In practice these judgments would probably be made by medical people.'

Human Capital

Schultz (1971) suggests that 'people enhance their capabilities as producers and consumers by investing in themselves', while Becker (1962) considers that activities that influence future monetary and psychic income by increasing the resources in people are called 'investments in human capital'.

seen, 8.5% of the sample is composed of patients who are under 65 years of age. This proportion of the sample is included as it allows a basis for comparison across the age groups and, more importantly, includes patients who were referred as severe clinical or social problems, requiring urgent treatment.

Conditions Referred

The conditions referred (table 4) cover a wide range, those listed being the major disability as many patients suffer from two or more disabilities.

Major disabilities, causing a patient to be unable to lead an independent existence, increase dramatically with age. By the age of 85 years, 80% of people are said to suffer from such a disability (Akhtar, 1973).

It has been reported that many of the conditions diagnosed in the elderly are remediable (Andrews *et al*, 1971).

Table 4: Main presenting condition, total sample

Diseases	Age (years)							Total	%
	0-64	65-69	70-74	75-79	80-84	85-89	90+		
Cerebro vascular accident	11	26	30	33	14	10	3	127	31.75
Osteo-arthritis	2	1	20	18	26	7	5	79	19.75
Other diseases	4	6	4	7	8	10		39	9.75
Rheumatoid Arthritis	4	5	5	3	6	1		24	6.0
Fractured femur	1	2	5	2	3	5	1	19	4.75
Other orthopaedic conditions	1	1		1	6	2	4	15	3.75
Other conditions	5	4	1	2		1	1	14	3.5
Bronchitis		3	5	3	2		1	14	3.5
Pain			3	1	3	3	3	13	3.25
Other fractures		1	2	1	3	1	1	9	2.25
Low back pain		3	2	1		1	1	8	2.0
Circulatory problems		2		2	2	1	1	8	2.0
Parkinson's disease		2	2	3				7	1.75
Multiple sclerosis	5							5	1.25
Frozen shoulder			1		2	1	1	5	1.25
Other respiratory disorders	1	2	1					4	1.0
Hip operation		1	1	1		1		4	1.0
Fractured humerus				1	2			3	0.75
Cervical spondylosis					1		1	2	0.5
Amputee				1				1	0.25
Total	34	59	82	80	78	44	23	400	100

Table 5: Treatment outcome by age, total sample

Age	Much better	Slightly better	No change	Worse	Hospital admission	Transferred to geriatric day hospital	Transferred to orthopaedic hospital	Died	Other
0-64	8	6	5		5	1	3	1	5
65-69	17	16	3		10	4		1	8
70-74	16	21	13		13	5	1	5	8
75-79	15	22	10	1	13	7	1	2	9
80-84	16	31	13	1	9	2			6
85-89	7	9	6	2	6	3	1	1	9
90+	6	10	2		2			1	2
Total	85	115	52	4	58	22	6	11	47

Treatment Outcomes

Included in the study sample are 145 patients aged 60 or over and 57% of this group achieved measurable improvement in their condition following a course of physiother-

apy treatment (table 5). While it is clearly impossible to prove conclusively that the improvement occurred because of their physiotherapy treatment it is significant that in the control group, receiving no treatment, only 20%

of the patients demonstrated an improvement following a three-week period from the date of their referral.

Table 6 clearly illustrates the benefits, in terms of time and convenience, of a domiciliary physiotherapy service to the patient. The figures shown are based on the mean values obtained from a total of 2,502 domiciliary visits and from a total of 317 ambulance journeys to the hospital physiotherapy department. As can be seen, there is a measurable improvement in 50% of the sample. On closer examination it will be clear that patients with certain conditions such as fractured humerus and ankylosing spondylitis are achieving a higher rate of improvement, ie 100%, low back pain 87%, multiple sclerosis 80% and bronchitis 77%. These are however small proportions of the total sample and it is too early to suggest that only certain conditions should be treated as domiciliary cases.

With the two main conditions referred, cerebrovascular accident and osteo-arthritis, 40% of patients showed improvement. Also in this group a number of patients were referred to the geriatric day hospital, the out-patient department or to the outcome classification labelled as 'other'. This includes patients who have moved away, preferred private physiotherapy treatment, refused treatment or have been admitted to an old people's home. A proportion of these patients could be considered to be part of the 'improved' group.

Cost Effectiveness

The cost of a domiciliary physiotherapy treatment is compared with the cost of a hospital based treatment, with and without the use of an ambulance, and the two treatment areas are seen to demonstrate almost identical costs (table 1). In the case of ambulance patients the outcome of physiotherapy treatment was 75% demonstrating measurable improvement.

At first glance these results might suggest that a hospital based treatment is more effective than the domiciliary equivalent. The ambulance sample however is made up of only those patients who were well enough to undertake an ambulance journey, and it can be argued that they were in a better condition than the patients making up the domiciliary sample.

With regard to the relative cost effectiveness, the price of an ambulance journey to hospital favours the domiciliary service. If the welfare of the patient is taken into consideration, the domiciliary treatment is shown to be both more cost effective and more beneficial (table 6).

Table 6: Comparison of treatment time (in minutes) domiciliary and ambulance groups

	Ambulance	Domiciliary
Waiting time at home	95.5	Variable but pre-arranged
Waiting time at hospital	50.8	nil
Travelling time	64.3 (8.59 miles)	14.99 (5.15 miles)
Treatment time	53.2	41.5
Total time elapsed	263.8	41.5

Based on 2,502 domiciliary visits, 317 ambulance journeys (mean values)

Conclusion

This article sets out to illustrate some of the approaches to a cost benefit analysis of a domiciliary physiotherapy service, using some examples from the current study within the South Birmingham Health District to illustrate the inputs required and the outcome expected from such an analysis. As stated, cost benefit analysis requires a monetary value to be placed on human life as well as various states of health and this is likely to be a major area of argument, not only on ethical grounds but also on grounds of practicality.

Investment resources can be put to many alternative uses in society, so any project such as the development of a domiciliary physiotherapy service must lend itself to a cost benefit analysis, otherwise its growth must be based on presumptions or value judgments.

During the recent industrial action within the NHS, when many old people were refused admission to hospital, domiciliary physiotherapy proved to be a cost effective way of maintaining old people in their homes, providing support to the relatives, the hospital consultants and the community team.

The question of a cost benefit analysis will not be considered until the completion of the present sample within the South Birmingham Health District. Until then the present study provides a cost effectiveness framework for the evaluation of a domiciliary physiotherapy service to the elderly.

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APPENDIX 15

FINANCIAL INFORMATION PROJECT
RESEARCH PROGRAMME



FINANCIAL INFORMATION PROJECT

Research Programme

Joint Management Team

Steering Group

Mr. R. W. Dearden	District Administrator, Hereford Health District
Mr. I. G. Nicholls	Assistant Regional Management Services Officer, WMRHA
Mr. D. Poynton	Area Treasurer, Coventry AHA
Dr. J. N. Todd	Specialist in Community Medicine (Information), WMRHA
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Project Team

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INTRODUCTION Many people in the NHS will now be familiar with the financial accounting and budgetary control system developed by the West Midlands RHA, known as the Standard Accounting System. A research programme, sponsored by the DHSS, into other aspects of the need for financial information, is now beginning, and this paper describes the new project. West Midlands RHA was appointed as the Centre of Responsibility in the NHS for the development of financial information systems in September 1975 by the Computer Standardisation Steering Committee, the predecessor of the NHS Computer Policy Committee. The appointment was part of the plan for the production of a number of national computer systems which will be available for use in all parts of the Health Service.

OBJECTIVES The aims of the project are:

- (i) To conduct research into the financial information required in support of health care planning and by clinicians in the organisation and management of their units.
- (ii) To design, develop and implement systems for production of this financial information.

PROPOSED PROGRAMME Proposed stages in the research programme are:

- (i) On the basis of consultation, to determine the financial information requirements for decision making in health care planning and in the organisation and management of clinical units.
- (ii) To establish field trials to test the relevance and usefulness of the financial information so determined.
- (iii) To examine in detail the relationship between financial and other information systems.
- (iv) To develop and test the required data collection systems.
- (v) To specify with the help of systems designers the appropriate computerised financial information systems.

DESIGN REQUIREMENTS Design of the systems must take into account that:

- (i) The systems must be appropriate to the wide variety of management structure and staffing levels encountered within the NHS.
- (ii) The systems must be sufficiently flexible to cater for the different levels and types of information required by individual users.

- (iii) The systems must be capable of linking with other appropriate non-financial information systems. The project should allow the possibility of the financial systems being part of a wider data base system.
- (iv) The project will not attempt to modify deficiencies which might be exposed in non-financial information systems, although they will be identified.
- (v) The system design should be as flexible as possible in its determination of the computer equipment on which it will be run.

SHORT TERM TASKS

Within the overall programme, certain short term tasks will be necessary in the first six months:

- (i) To investigate all relevant existing work throughout the NHS and in other related fields.
- (ii) To review the relevant literature, including that relating to practice in other countries.
- (iii) To design a survey of clinicians on their attitudes to the use of financial information for the management of clinical units.
- (iv) To suggest specific experimental centres in which to run field trials. Account must be taken of projects already in progress in related fields, such as experiments in management information for clinical teams and research into speciality costing.

CONSULTATION TIME SCALE

Consultation is a vital part of the research programme. In an endeavour to ensure that discussion will be as wide as possible, papers as set out below will be published and widely distributed. These will give an opportunity for formal consultation to take place within professional organisations and other interested groups. The programme will, of course, rely heavily on informal consultation at all levels of the NHS throughout the entire period.

Individuals and organisations are encouraged to contact members of the project directly.

Target Dates:

- | | |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| May 1979 | Publication of research programme brief and objectives. |
| Autumn 1979 | Preliminary statement of the financial information requirements of health care planning and of clinicians for the organisation and management of their units. Proposals for experimental centres. |
| Autumn 1980 | Interim progress report. |
| Autumn 1981 | Final proposals and outline system specifications. |

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A D D E N D U M

The study of 47 young orthopaedic patients, described on pages 209-224 has been accepted for publication by the journal of the Chartered Society of Physiotherapy.

An article commissioned by Update Publications Ltd., entitled "Prescription Physiotherapy" and based on the whole study is being published in the June edition of Update, Journal of Postgraduate General Practice.

A book entitled "Community Rehabilitation" commissioned by the publishers Faber & Faber, is in the course of preparation and is due to be published in the Spring of 1982. This book is based on the work carried out during the study of domiciliary physiotherapy.