The Clinical Role of the Hospital Pharmacist In the United Kingdom National Health Service

by

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Abstract

This thesis examines the roles adopted by clinical pharmacists in the United Kingdom (UK), the evidence for the effectiveness of the interventions arising from these roles, and the challenges to and opportunities for future developments in clinical pharmacy.

The research was undertaken in four phases: problem definition; national survey of services currently provided; in-depth interviews on roles; and a review of literature on effectiveness.

A literature search provided background information on the evolution of pharmacy and of clinical pharmacy, particularly in the UK. These developments in have been set in the context of changes in health care provision and in the roles of the other health care professions and occupational groups. Preliminary interviews, meetings and group work were carried out to facilitate clarification of the research questions and to assist in the choice of methods.

Two nationwide postal questionnaire surveys were conducted. One inquired about the provision of clinical pharmacy services to the primary care sector and the other about service provision within secondary care facilities in the National Health Service (NHS). The response rates were 91% and 90% respectively. The results show some diversity in the provision of clinical pharmacy services and provide possible explanations for this variation.

Subsequently, semi-structured interviews were conducted with pharmacists, pharmacy technicians, doctors, nurses and managers at eight sites selected to represent different characteristics of hospitals. These qualitative data were analyzed by constant comparison. The results provide a picture of the clinical roles that hospital pharmacists are, and should be, providing. In addition, they indicate the potential barriers to, and opportunities for, future role development.

An assessment of the evaluative literature on clinical pharmacy services was undertaken. Most literature is descriptive and much of the evaluative literature has shortcomings. The results present the evidence for the effectiveness of clinical pharmacy services in improving patient care and financial outcomes in the UK NHS.

Finally, quantitative information gathered in the questionnaire survey, qualitative information from the interviews and the literature evidence were combined to create models of the future role of the hospital clinical pharmacist in the UK.

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To my parents, Nicholas and Anne Marie Cotter.

Acknowledgements

CHAPTER 1

INTRODUCTION

1.1. Preamble.

Pharmacists working in hospitals perform many functions, one group of which are termed "clinical pharmacy". In the United Kingdom (UK), clinical pharmacy has evolved over 25 years from the ward pharmacy service. The development of ward pharmacy was officially recognised and advocated in 1970[1] but it was 1988 before the Department of Health officially endorsed clinical pharmacy[2-4]. Several documents have described and defined clinical pharmacy[5-7] producing a variety definitions of clinical pharmacy and of the role of the clinical pharmacist. There are, however, few data on whether these reflect the reality of hospital pharmacy practice in the UK.

There is also little information on pharmacists' views on their present and future roles. It is essential that pharmacists develop a role that is appropriate to the needs of the National Health Service (NHS) and that pharmacy managers facilitate this when planning services. To enable pharmacists to shape their future role, they must be able to define the services that they currently provide. It is not known if what are presently considered to be clinical pharmacy services are appropriate future roles for the clinical pharmacist.

Health care resources have become increasingly scarce and the NHS changes have emphasised the need to provide cost-effective services. Pharmacy services are now subject to scrutiny; the need to demonstrate that these are effective and efficient is pressing.

The future of the hospital pharmacist as a professional is changing. These changes in professional role reflect, and may be analogous to, changes in the roles of other health care professions and occupations. A clear view of the future role of the hospital pharmacist is desirable to maintain, or even to enhance, pharmacy's professional status.

Some fundamental questions need answering;

> what is clinical pharmacy?
>
> why did it develop?
>
> what was its effect on the role and professional status of hospital pharmacy?
>
> what forces are currently shaping hospital pharmacy?

The introduction to this thesis attempts to provide the answers to these questions. It begins with a brief history of the development of hospital pharmacy in the UK.

1.2.   The Development of Hospital Pharmacy in the UK NHS.

In the 19th century hospitals rarely employed qualified chemists and druggists to dispense medicines. Until the employment of pharmaceutical chemists by the London and Westminster Hospitals in the 1860s, it was common practice to employ an apothecary to dispense. By the 20th Century it had become usual to employ a pharmacist to run hospital dispensaries but unqualified staff continued to dispense medicines in hospitals and the salaries of hospital pharmacists were low. The NHS Act (1946) brought existing hospital pharmacy services into the newly formed NHS. It had little initial effect on hospital pharmacists despite hopes for improvements in their status[8].

In 1955 the first Linstead Report[9] reviewed the provision of hospital pharmaceutical services. The authors found that there was a shortage of staff in hospital pharmacies due to low salaries, lack of definition of the function of the pharmacy in the hospital and ignorance among pharmacists of their potential role in hospitals. Among the recommendations was that all hospital pharmacies should be under the control of a pharmacist. Subsequently, the Ministry of Health surveyed functions and staffing and the resultant, unpublished, report re-emphasised the need for organisation of hospital pharmacy services to ensure efficiency and economy[10]. Few of its recommendations were implemented[11].

In 1968, the Ministry appointed a working party to advise on the efficient and economic organisation of the hospital pharmaceutical service with particular reference to the most suitable organisational units for the service, the most appropriate use of pharmacists and their educational needs. The main effect of the resultant Noel Hall report[1] was to create Areas and Area Pharmacists (APs) within Regions. APs were charged with organising services in areas providing services to about 250,000 people. Such areas were thought to be sufficiently large to produce economies of scale in pharmaceutical services such as production. New grading structures were created for pharmacists and technicians. In the context of the development of clinical pharmacy, the report emphasised the hospital pharmacist's consultative role. In co-operation with other staff s/he should ensure the most effective, safe and economical use of drugs. It recognised pharmacists' knowledge of clinical pharmacology and their advisory role in prescribing. Pharmacists had a role in advising on formulation, stability, incompatibilities and conditions of storage, dosage and administration methods, quantitative and qualitative identification of drugs, drug interactions, contraindications and side effects, and costs and sources of drugs. The development of drug information services was recommended and the

new ward pharmacy system was commended.

Despite some differences in recommendations, the organisational changes suggested in the Noel Hall Report were blended with those of the 1973 NHS Reorganisation Act[12]. Pharmaceutical services were managed at the individual hospital level by Chief Pharmacists who were, in turn, managed by Pharmaceutical Officers at the new District (DPhOs) level and by Area (APhO) and Regional Pharmaceutical Officers (RPhOs). The Area tier was abolished and replaced by smaller Districts in 1982 following a Royal Commission Report[13]. The practical effects for the pharmacy service were few although pharmacists worried that they had lost their access to the management structure since DPhOs had less access to managers. An investigation of hospital pharmacy services in England and Wales in 1982[14] revealed that recruitment and retention of staff was still difficult although it had eased somewhat since 1970. Pharmacists now commonly visited wards but still had little role in training nurses and other non-pharmacists.

Greater changes, such as in general management, and eventually the clinical directorate structure, stemmed from the 1983 Griffiths Report[15]. Although efficiency in the provision of hospital care had been at the forefront since the 1970s, the vogue for consensus management was felt to have been inefficient. This report introduced a new style of management to the NHS. Its effects, plus those of the NHS Reforms[16] and the movement to primary care[17] in the late 1980s and early 1990s, would have far-reaching implications for hospital pharmacy services. The effects on the clinical pharmacy service will be addressed in Section 1.4.3. The organisational effects were, briefly, that pharmaceutical services provided by Regions and Districts (and their equivalents), such as production, purchasing, quality assurance, education and drug information, were threatened by the new independent NHS trust hospitals. This is a source of concern to pharmacists since these co-operative ventures had evolved from the Noel Hall Area structure based on economies of scale and organisational efficiency. There is freedom to contract pharmacy services within hospitals or purchase them from external agencies. This topic has been addressed by Howe in 1993[18]. Her conclusions were that the introduction of decentralised management could cause fragmentation of the hospital pharmaceutical service within hospitals and at higher levels (district and regional tiers). She perceived a need to consider methods to retain the integrated hospital pharmaceutical service in trusts and to maintain comprehensive, rational, economic and viable pharmaceutical services across trust boundaries. Such endeavours would be facilitated by the creation of clear lines of

managerial and professional accountability, service agreements, good communication networks to ensure pharmacy issues were considered in strategic planning and in operational decision-making, and the provision of pharmaceutical advice to decision makers, such as purchasers[18].

The next section reviews the development of clinical pharmacy, one component of hospital pharmacy.

1.3.   The Development of Clinical Pharmacy in the UK NHS.

1.3.1. The Development of Ward Pharmacy.

In the UK, clinical pharmacy first developed in the hospital sector from a service known as "ward pharmacy". Ward pharmacy had evolved in response to concerns about the safe use of drugs in hospitals in the 1960s. Errors were reported in the administration of drugs to patients in hospitals[19]. It was suggested that these could be due to the number and ambiguity of prescriptions[19], transcription of prescriptions by nurses[20], the increased number of drugs on the market and the complexity of prescribing[1]. The introduction of patient-specific drug charts[21,21] improved the situation[22,23]. Deployment of pharmacists to the wards to provide a drug supply service was also thought necessary and was associated with a reduction in the incidence of discrepancies between prescribed and administered drug therapy[24]. Nurses and doctors often consulted ward pharmacists about medicines and their use, thereby increasing their advisory role[24]. Ward pharmacy was commended by the Department of Health in 1970, both in the Noel Hall Report[1], which has been described earlier, and in the Gillie Report[25], which recommended the adoption of a new type of prescription sheet, measures to improve prescription-writing and administration of drugs, and the introduction of ward visits by pharmacists.

1.3.2. The Transition to Clinical Pharmacy.

The ward pharmacy service expanded in the following 25 years and several new services were initiated, including drug information and therapeutic drug monitoring. Some of these new roles were termed clinical pharmacy services. Their provision was endorsed by the Department of Health in 1988 as a means of increasing the cost-effective use of medicines and enhancing patient care[24]. Hospital pharmacists appear to have adopted these new roles willingly and clinical pharmacy is thought to be practised to some extent in most NHS hospitals. Increased demand for education has resulted in the provision of post-graduate

courses in the subject in most UK Schools of Pharmacy. Hospital pharmacy has become more appealing, salaries have increased[26] and the career is viewed as attractive by new graduates.

1.3.3. Defining Clinical Pharmacy.

The definition of clinical pharmacy has exercised the minds of pharmacists in the UK and elsewhere. Several professional and policy research organisations[5-7] and the Department of Health[2-4] have provided definitions of clinical pharmacy in the UK but confusion persists.

The United Kingdom Clinical Pharmacy Association (UKCPA) defined it in 1983[7] as services *"through which all practising pharmacists exercise their responsibilities toward the care of patients"*. The Nuffield Report[5], published in 1986, described a clinical pharmacist as someone who would *"help particularise the medication to be used. .. the pharmacist can contribute to the choice of drug regimen, particularly when more than one condition is being treated. The pharmacist should be in a position to supply the physician with evaluated information on pharmaceutical and therapeutic aspects of drug use as well as on the toxic profile of drugs. He can help decide which dosage form or formulation of an active principle should be used and the best route of administration of a medicine; he may be expected to undertake the responsibility for deciding the formulation of a medicine or other treatment which the clinician has prescribed; and he may take responsibility for dosage calculations"* but would not diagnose. *"The contribution of the pharmacist is additive to, and not a substitute for, that of the doctor"*. In 1988, the RPhOs' Committee[6] said that clinical pharmacists *"should help individualise patients' medication, promote patient compliance and promote the safe, rational and economic use of medicines"*. The Department of Health (in England and Wales) added its interpretation in a Health Circular "The Way Forward For Hospital Pharmaceutical Services"[2] in the same year. Clinical pharmacy was a developing role *"in which pharmaceutical skills are systematically applied to medicine usage both at the policy-making level and in the treatment of individual patients"* but the role was limited to help at the request of doctors. Similar documents, published in Scotland[3] and Northern Ireland[4], contained the same definition.

Outside the UK, various organisations have attempted also to define clinical pharmacy. A World Health Organisation (WHO) working party report[27] stated that *"clinical pharmacy services involve the pharmacist in the solution of medicine-related clinical problems, the provision of advice and information on medicines, education of in- and out-patients and also*

of health care staff, therapeutic drug monitoring and any other task which will promote the rational use of medicines". The European Society of Clinical Pharmacy (ESCP) in association with the Societe Francaise de Pharmacie Clinique (SFPC) and the UKCPA[28] stated that *"clinical pharmacy may be defined as the attitudes, skills and knowledge required by pharmacists in order to ensure the appropriate, effective, safe and economic use of drugs by individual patients and by society"*.

Clinical pharmacy has also been defined in the United States (USA) and Canada. The Canadian definition describes activities carried out by clinical pharmacists[29] *"which are patient-orientated, the primary objective being the promotion of rational drug therapy"*. This definition is consistent with European thinking. In the USA clinical pharmacy has been defined in terms of specific services and their components[30]. The perceived lack of an overall service philosophy has led to the development of the concept of "pharmaceutical care"[31,32]. This is *"a covenantal relationship between a patient and a pharmacist in which the pharmacist performs drug-use control functions (with appropriate knowledge and skills) governed by awareness of and commitment to the patient's interests"*. The idea is similar to that of clinical pharmacy in the UK. The definition of clinical pharmacy in Australia[33] is like that in Canada and Europe.

Official definitions of clinical pharmacy depict pharmacists helping optimise patient care by using their specialist knowledge of medicines in a patient-orientated manner. Barber[34] suggests that clinical pharmacy is *"about the optimal use of drugs, ensuring that those reaching the patient are safe, effective, offer value for money and quality of life"*. This definition probably reflects current thinking on the topic in the UK.

1.3.4. Defining Clinical Pharmacy Services in UK NHS Hospital Pharmacies.

The UKCPA document[7] stated that clinical pharmacy services included: -

(i).   **Education of patients on drug use** - on appropriate use of medicines, precautions to be taken during treatment and anticipated side effects

(ii).   **Education of health care staff** - by regular ward visits, participating in ward rounds and unit meetings, by lectures, seminars, bulletins, formularies and meetings with prescribers (via drug and therapeutics committees)

(iii).   **Advice and information on drugs** - pharmacists were to help solve clinical problems in individual patients

(iv).   Pharmaceutical expertise applied to clinical problems for example, in the design

and preparation of the most suitable means of drug administration for a particular

patient, in the provision of paediatric dosage forms, aseptic dispensing and intravenous

additive services, in the formulation and preparation of special parenteral products and

in the design of systems to improve patient compliance and reduce drug administration

error.

(v).   **Surveillance of drug use** - to monitor patient compliance, to contribute to the

monitoring and assessment of the effectiveness of treatment and to help develop drug

usage review, to detect and report adverse drug reactions, to measure and interpret

plasma drug levels and to design dosage regimens.

It viewed clinical pharmacy as a service which all pharmacists could provide. In this, the
earliest official UK document on clinical pharmacy, the experiences of other countries in the
provision of clinical pharmacy services were noted. However, the document was created by
six members of the UKCPA largely independently of foreign influences (Personal
Communication: S Hudson, 1992).

The other main documents on clinical pharmacy published in the UK, the Nuffield Report[5],
the RPhOs' Statement[6] and The Way Forward[2-4] delineate similar roles. The Nuffield Report[5]
considered all aspects of pharmacy. Its authors came from a variety of disciplines and this
stimulated much discussion on pharmacy and its role (Personal communication: AT Florence,
1992). They sought evidence from pharmacists and non-pharmacists in the UK and visited
European countries (Sweden, Holland, Germany and France), the USA and Canada to broaden
their perspective. The document describes a narrower role for hospital clinical pharmacists
than that described by the UKCPA. The interaction between the doctor and clinical
pharmacist, and professional boundaries were emphasised. Less significance was attached to
the clinical pharmacists' role in the direct care of the patient via counselling and other
activities. The RPhOs' Statement[6] referred to, and expanded on, the Nuffield Report's
recommendations by adding direct patient care roles similar to those mentioned by the
UKCPA[7]. It also mentioned co-operation with clinical pharmacologists in the development of
"adverse drug reaction monitoring schemes", a role for pharmacists in ensuring the economic
use of drugs *"through provision of information on costs and independently evaluated 'best buy'
data"*, and pharmacists as members of multi-disciplinary clinical teams in areas such as
Intensive Care, Coronary Care and Special Care Baby Units, oncology, pain control and
intravenous nutrition following surgery. The authors referred to the American literature.

Documents stemming from the RPhOs' Statement[35][36] broadened the clinical pharmacy role and introduced the concept of quality management in the provision of pharmaceutical services. An earlier version of the ESCP/SFPC/UKCPA document on education and training for clinical pharmacy[28], published in 1988 by the ESCP and UKCPA[37], was also quoted in the RPhOs' Statement[6]. This listed clinical pharmacists' functions under the headings of knowledge, skills and attitudes. It was in broad agreement with the roles described by the UKCPA in 1983[7].

The Department of Health's[2-4] view of the role of the hospital clinical pharmacist included assisting the doctor in "prescribing decisions and in monitoring and modifying drug therapy", independently "counselling patients on the ward prior to discharge" and having a function "in clinical trials of medicines". The Way Forward[2-4] presumed that some services were already being provided by hospital pharmacies. These were the routine review of prescriptions, drug information, guidance and preparation of products for specific patients, and systems to encourage rational and economic use of medicines. The development of several services was recommended, including patient medication history-taking, adverse drug reaction (ADR) monitoring, the provision of active assistance to doctors making prescribing decisions, monitoring and modifying drug therapy, a therapeutic drug monitoring (TDM) service for drugs with narrow therapeutic indices, patient counselling prior to discharge, involvement in all stages of clinical trials and the development of practice research. The recommendations of the Nuffield Report[5] were taken into account in this document as was literature from the USA and the UK in which attempts had been made to evaluate clinical pharmacy services (Personal Communication: J Howe, 1992).

1.3.5. Clinical Pharmacy - The International Perspective.

Clinical pharmacy has developed at a slower pace in Europe than in the UK (Personal Communications: Gerhardt Carstens, Germany; Rosa Lina Piheiro, Portugal; Jean-Pierre Delaporte, Belgium; Kari Horvei, Norway; Liisa Eskelinken, Finland; Kerstin Bingfors, Sweden; Mairin Ryan, Ireland, 1992). Pharmacists in many of these countries admire the UK service and seek to develop their own along similar lines.

In the USA, the American Society of Hospital Pharmacists (ASHP)[38] have delineated the role of the clinical pharmacist. The roles mentioned in this document are similar, in many ways, to the roles referred to in UK documents. The roles include the monitoring of patients' drug therapy "to increase the effectiveness and minimise potential risks of drug therapy", patient

counselling, pharmacist participation in the development of patient-specific therapy plans, education of health care professionals, adverse drug reaction monitoring, research, and so on. However, pharmacists in the USA are expected to document their contribution to patient care in the patient's medical record and to provide *"oral or written consultations"* for *"health-care professionals regarding drug therapy selection and management"* making their service much more formalised than the service in the UK. They, like UK pharmacists, provide drug utilisation review services but also contribute to quality assurance programmes. As mentioned in Section 1.3.3. the perceived lack of an overall clinical pharmacy service philosophy in the USA (in contrast to the UK) may have contributed to the development of the concept of pharmaceutical care"[31,32]. Much has been written about pharmaceutical care in the USA. It appears that its main philosophy is the patient orientation of services. A contributory factor to its development may have been the significant division between "clinical" and "traditional" (drug supply) functions in the USA. In Canada, where splitting of clinical and traditional pharmacy roles has not been encouraged, the role of the hospital pharmacist was described in an extensive document[29]. It is similar to the role described in the UKCPA document[7] although much more specific. The Australians have produced a set of documents establishing standards for clinical pharmacy activities which name the activities performed by clinical pharmacists[39], indicate new areas of activity and provide guidelines for standards of practice[40-43]. The services are similar to those in the UKCPA document[7].

A striking similarity exists in the descriptions of the role of the clinical pharmacist in documents produced within and outside the UK. The differences between them is in the emphasis, either on the service or on a service philosophy. In the UK, the emphasis is on patient care as the philosophy guiding pharmacists in the provision of clinical pharmacy services; in the USA in particular, but also in Canada and Australia, greater importance is attached to a specific service description and standards of service provision. This may reflect international differences in health care systems.

1.3.6. The Extent of Clinical Pharmacy Development in UK NHS Hospital Pharmacies.
The UK literature provides descriptions of many clinically-orientated services. This literature is assessed in Chapter 5. It mainly contains reports on service development or assessment from individual hospitals. A number of surveys of services have been performed but the extent to which hospital clinical pharmacy services have developed in the UK NHS has not been formally assessed in the last 10 years.

Two main assessments of clinically orientated services have been performed in the NHS. In 1971, an assessment of the organisation and work of hospital pharmacies was published[44]. It complemented the Noel Hall Report[1] and included a work study of activities at 33 hospitals. Among its findings were that few hospitals were providing ward pharmacy. The idea of ward visits by pharmacists was developing. Advice on drug use was available at all sites but this was usually a responsive rather than a proactive service. Research was rarely carried out and there was little activity in training or in clinical trials. In 1984, the Operational Research Service of the Department of Health and Social Security (DHSS) considered the extent to which clinical pharmacy services had developed, the cost and benefits of the service and implications for pharmacy[45]. Approximately half of RPhOs reported that ward pharmacy was provided to all beds in their region although the nature of the service varied greatly. It was claimed that each region had at least one hospital where clinical pharmacy was highly developed and a number of hospitals where little or no clinical or ward pharmacy was provided. In most, the service was based on ward pharmacy. An accompanying selective review of the literature, which was discussed with practising pharmacists, showed that there was considerable debate regarding the meaning of clinical pharmacy. The author's impression was that it had been allowed to develop in a *"haphazard fashion"*. *"Many services appear to have been introduced with no clear view as to what achievements were being sought or, if aims had been expressed, no mechanism for assessing progress towards them"*. He also found that service success was considered in terms of process not outcome, costs were ignored, unsubstantiated claims were often made for service effectiveness and non-pharmacists attitudes to the developments were neutral or positive. Pharmacists, however, believed that clinical pharmacy was the way forward for the hospital pharmacy service. It would permit them to use their skills appropriately for the benefit of patients. No conclusions were reached on the benefit of clinical pharmacy because of the difficulty in studying an ill-defined service on a national basis and the lack of evaluative data on the service.

Surveys have described the extent of hospital pharmacy involvement in services such as the creation and implementation of drug policy via drug and therapeutic committees (DTCs) and formularies, the provision of drug information, clinical pharmacy education, ADR monitoring, and out-of-hours services and participation in practice research.

A 1975 survey of 150 chief and group chief pharmacists in England[46] obtained a 80% response rate. Seventy respondents said that there was a committee that dealt with drugs and

related matters in their area or hospital. Most teaching (72%), but few other (30%), hospitals had such committees. From 1948, when the first committee was established, to 1968 their numbers increased steadily but after that time there was a much more rapid increase in numbers. All but one included pharmacists. A census of district health authorities (DHAs) and boards in 1983[47] revealed that 198 had DTCs which were usually comprised of doctors, nurses and pharmacists and had a mean of 9 (range 2-23) members. Sites providing information on their terms of reference (131) said that these included development of drug policy (106), achievement of economy (86), promotion of safe drug use (65), provision of information on drug costs and efficacy (31), and monitoring the use of and expenditure on drugs (30) and new drugs (27).

Middlebrook's[48] survey of 42 UK hospitals in 1979 found that many had developed (12) or were in the process of developing (8) formularies, prescribing guidelines or policies for the introduction of new drugs. Work on these had started in 1970 in some cases. They were designed to reduce costs (10), educate prescribers (10), facilitate rational prescribing (10) and help with drug selection. A telephone survey of DHAs in 1985[49] had a response rate of 83%. It found that 75 (36%) had formularies extending to all hospitals in the DHA and covering all or most drug categories, 48 (23%) enforced some restrictions on prescribing and 32 (15%) had no formulary.

The national drug information network, which was formed in 1975, was described in detail in 1981[50]. The names of several specialist centres were given in this paper and the activities supported by the network were described (such as the production of bulletins, literature abstracts, transfer of information, education and training and the setting up of an annual conference to exchange ideas), and the sources of information at the various centres were enumerated.

The provision of education to aid the development of clinical pharmacy was reviewed in 1977[51]. Nine postgraduate courses in clinically-orientated pharmacy were then available. A 1979 questionnaire survey of Area Health Authorities (AHAs) and their equivalents[52] revealed that, of the 47 (54%) that replied, 35 provided education in clinical pharmacy, 31 in support services and 28 in management. In 22 AHAs education was organised at regional level and in 10 it was on an ad hoc basis. Many sites (27) had links with a university and 35 had teacher practitioners jointly employed with a university.

A 1993 survey on the conduct of practice research was carried out in 22 units in an English regional health authority (RHA)[53]. The 21 replies, which provided data from 18 clinical trainers and 17 senior pharmacy managers, revealed that 15 units had a pharmacist who had successfully completed or supervised a project in the past and 11 had individuals with a research commitment. Details were obtained on 199 projects. Most were concerned with drug usage (55%). Research was often undertaken to support service development (37%) or as part of the pre-registration requirements (23%). Most managers did not afford practice research a high priority and the main barrier to its performance was a lack of resources.

The results of a postal questionnaire survey of APhOs in England and Wales and Chief Administrative Pharmaceutical Officers (CAPOs) in Scotland, published in 1980[54], found that most pharmacy departments kept Committee of Safety of Medicines (CSM) cards (95/119), some distributed them to the wards (64) but few ward pharmacists carried them (41). Pharmacists frequently or sometimes recommended making ADR reports in 88 sites, were told the reports had been sent in 68 and completed the report in 17. Some sites (42) had attempted to channel reports through the drug information service but 12 said that no reports were reaching the CSM in this way and a further 14 made comments about the lack of success in this area. Some sites (30) were involved in encouraging reporting and 17 in monitoring patients for ADRs. Most (71%) would like to be more involved in reporting ADRs to the CSM or in additional ADR schemes (58%).

A 1978 survey of 16 hospital providing extended opening hours[55] revealed that 8 had residency services and 6 provided a service using a pharmacist on-call from home. One fifth of calls to these pharmacists were for drug information and advice but most concerned drug supply.

These results showed that pharmacists were probably involved extensively in DTC and drug policy work and were less involved in the provision of other services. Little recent work has been carried out in this area. There are few data on the extent to which clinical pharmacy services are currently provided in UK NHS hospitals and no comprehensive examination of the area has been carried out in the last 10 years. The effects of the many official documents on clinical pharmacy[2-7], including those from the Department of Health[24], have not been formally evaluated.

1.4.   Forces of Change on the Pharmacy Profession in UK NHS Hospitals.

This topic has been addressed comprehensively in a recent publication by the author[56] which considers hospital pharmacy within the theories of professions and compares the effects of clinical pharmacy on professionalisation with those of other forces such as the NHS reforms, patient empowerment, the growth of other professions and technological change. In the publication, the author suggests steps that the profession should consider if it wishes to further raise its professional status. A brief summary of the publication is provided here and the document is replicated in Appendix 1.

1.4.1. Pharmacy and the Theories of Professions.

Older theories define professions as occupational groups that possess certain characteristics such as a tradition of service to the individual, a technical knowledge base, an altruistic nature[57], monopoly powers[58], specialized training and education, formal examinations of the competence of members, and the presence of a professional organisation and a code of conduct[59]. These have been criticised primarily for their representation of only a few professions and their utopian view of reality[58,60]. The theory of occupational control is thought to better describe pharmacy[60]. It proposes that pharmacy, a less professionalised occupation, is dominated by the more professionalised occupation of medicine[61]. This simplistic view is challenged by the author on the grounds that it does not provide for the division of pharmacy into several branches whose practitioners behave in different ways nor for differences in practice within these branches and it fails to describe hospital pharmacy adequately in the light of recent developments in hospitals[56]. The author's view is that several forces, namely the development of clinical pharmacy, the introduction to the NHS of contracting and greater managerial control, changes in the status of professions in general and patient empowerment, have altered hospital pharmacy's status and lessened its domination by the medical profession.

1.4.2. The Effect of Clinical Pharmacy on the Profession in Hospitals.

Clinical pharmacy has been viewed as a professionalising force in hospital pharmacy[62]. By acquiring new roles, which have increased the prestige of their work and their power within the hospital structure, hospital pharmacists have elevated their professional status. Education for the performance of clinical pharmacy roles has increased the knowledge base of hospital pharmacists. Clinical pharmacy has enabled pharmacists to become partners in care with doctors and other health professionals. It has provided them with new patient-orientated roles, including the identification of those in need of education, counselling or additional monitoring

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of their drug therapy and the provision of the appropriate services. These functions are performed separately from, although in collaboration with, other health care professionals demonstrating the professional traits of independence[60] and a duty to the individual patient[57]. Hospital pharmacists have begun to prescribe[63] and provide care[64,65] for patients within multidisciplinary teams. The increased trust placed by health professionals in pharmacists, and the recognition of pharmacists' expertise in the area of medicine use, accords with the increase in indeterminacy of pharmacists' knowledge[66] and has enhanced the professional standing of hospital pharmacy. Claims that pharmacists have merely assumed roles delegated to them by doctors are countered on the grounds that doctors rarely performed these roles, although it was admitted that this may have been a factor in some hospitals. Assertions that pharmacy will remain professionally limited unless pharmacists assume responsibility for prescribing are considered to be outdated. Prescriptions are now the end products of a decision-making process that draws on the skills of both doctor and pharmacist, having regard to the particular needs of the patient and to joint pharmacy-medical drug policies. They are less often the product of unconstrained medical decision-making.

The potential for clinical pharmacy to be a de-professionalising influence (that would reduce professional status and power), via increased specialisation and fragmentation, has been considered by the author[56]. This risk was thought to be less than that of other threats such as reduced resources for education, the NHS changes and general changes in society.

1.4.3. The Effects of the NHS Changes on the Profession in Hospitals.

The NHS has undergone successive radical changes with implications for the professions. The most recent NHS changes are thought likely to have the greatest effect on pharmacy. The NHS reforms[16] have initiated the purchaser-provider split and enabled hospitals and general practitioners (GPs), respectively, to become independent providers and purchasers of health care. There has also been a shift in the emphasis in the funding and provision of health care to the primary sector[17]. The effects of these changes could cause deprofessionalisation in hospital pharmacy or offer opportunities for increased professionalisation.

The NHS changes are considered to have opened up new avenues of professionalisation in primary and secondary care both in the direct care of patients and as advisors to other health care professionals. However, the increase in managerial power in the NHS with a consequent increase in bureaucracy and the exertion of greater external control on professions, along with

the emphasis on stricter budgetary control, threaten to deprofessionalise hospital pharmacy. This could be caused by a reduction in pharmacists' numbers, which may deprive hospital pharmacists of those roles that have contributed most to their enhanced professional status. Pharmacists could also lose roles to other professions and occupational groups whose members are less expensive to employ[56].

It is thought that the nature of the lost roles will determine the net effect on professional status. If the forfeited roles are those that do not require the skills of a pharmacist, the change will de-skill certain tasks leaving the professional standing of pharmacy unaltered. Delegation might even increase professionalisation by releasing pharmacists to take on new roles more appropriate to their professional knowledge. It is suggested that pharmacists could help preserve their status, in the face of such challenges, by delegating roles that are within the competence of ancillary and technical staff and by automating other suitable tasks. This will allow pharmacists to retain and develop roles requiring their professional input. Roles that the author has suggested could safely be delegated include much routine dispensing, some technician training, some patient counselling, almost all stock control and management, and routine computing[56].

1.4.4. The Effect of Societal Change on the Profession in Hospitals.

Certain changes in society, and in the position of professionals in society, have taken place in recent decades. Technological advances, increased consumer power and the increasing emphasis on knowledge have modified the power and status of professions and raised the threat of deprofessionalisation. It is thought that deprofessionalisation can result from a growth in knowledge, necessitating specialisation and the resultant fragmentation of a profession, or the development of new professions that try to encroach upon the territory of older professions[67]. An opposing view is also discussed; that increased knowledge is not a threat to professions but that technical knowledge is increasing in importance as a means of controlling and managing social and political matters and will stimulate professionalisation[68]. These conflicting opinions remain to be resolved. In pharmacy these changes could increase or reduce professional status[56].

Threats exist from other professions encroaching on pharmacy territory[56]. Nurses may threaten pharmacy since they are less expensive to employ and appear to be extending their roles in areas pertinent to pharmacists, such as prescribing[69] and team care, although as they extend

their roles they may become more expensive to employ. Threats from technological advances are addressed, especially those consequent on the development of computer programs that contain pharmaceutical knowledge in areas such as drug interactions and patient counselling[70]. Freidson has argued that the ever-present gap between available knowledge and that which is stored on computers, together with the retention of professional control over the nature of stored knowledge and its use, will prevent computer technology exerting a deprofessionalising influence on medicine[71]. The author feels that this argument, equally, can be applied to pharmacy[56]. Furthermore, the author is of the opinion that the individuality of patient's needs and their response to medicines will generate an ongoing requirement for professional input in care. For these reasons it is unlikely that software could replace pharmacists[56]. The delegation of roles not requiring professionals' skills to ancillary staff, or their automation, could make hospital pharmacy services more cost-effective and hence protect it against the loss of territory to other occupational groups. Encroachment by other professional groups is thought to be a future hazard of changes in professional roles in general and the growth of new professions whose status is increasing in a knowledge-driven society. It is, therefore, suggested that hospital pharmacy further protect itself by delineating its professional boundary and by achieving consensus on its professional identity[56]. A promotional leaflet on hospital pharmacy, that included a description of clinical pharmacy services and of pharmacy's contribution to team care both in hospitals and at the interface between primary and secondary care, was published by the Royal Pharmaceutical Society of Great Britain in 1993[72]. It is noteworthy that no more substantive document on this issue has emanated from this body.

Finally, patient empowerment, consequent to societal changes, is thought to pose some threats of deprofessionalisation but is considered more likely to offer hospital pharmacists new roles and an opportunity to further professionalise. By accepting the patient's right to help decide their health care needs, and by seeking to accommodate these within a professional framework, hospital pharmacy can continue to develop. The adoption of the concept of pharmaceutical care, where pharmacists' primary duty is to the patient, is thought to be a first step along this path[56].

1.5. Summary. The Need for Action.

Hospital pharmacy in the UK NHS has changed dramatically since the foundation of the NHS. The development of ward pharmacy prompted this change. Clinical pharmacy subsequently

evolved and has provided pharmacists with new roles and challenges. Similar changes have taken place, or are underway, in other countries around the world.

There are several official definitions of clinical pharmacy, including those provided by the Department of Health. This, plus the haphazard manner in which services have developed, may have generated confusion regarding the precise meaning of the term and the services it encompasses. Official publications agree on some aspects but vary in others. It can, however, be loosely defined as those aspects of pharmacists' work that seek to ensure the safe, effective and economic use of medicines and an enhanced quality of life for patients. Few data are available on the extent to which this definition is acceptable within the profession.

The historical development of pharmacy in the UK lends credence to the suggestion that pharmacy is not fully professionalised; that it is an occupation limited by the medical profession. Clinical pharmacy has, however, increased the professional status of hospital pharmacy and may have freed it from medical domination. Clinical pharmacy is important for the future status and role of the profession in hospitals. The NHS changes, advances in technology, the growth of new professions, the changes in the roles of established professions and patient empowerment will have significant implications for hospital pharmacy. Whilst these may threaten hospital pharmacy's status they may provide also opportunities for role extension and for further professionalisation.

The successful future development of clinical pharmacy in hospitals requires greater consensus within the profession on the essential clinical role of the pharmacist. The profession must make difficult decisions about its role and territory. Definition of the profession's place in society and in health care will help preserve its status. This will assist in the maintenance of professional standards and thereby standards of care for patients. It will facilitate also the development of pharmacy education to meet future needs and will help define a career path for pharmacists. The profession needs to decide which roles can be delegated and which must be retained by pharmacists. This issue needs to be tackled both by the profession in general and by each of its branches, since practice varies significantly between each branch of pharmacy in the UK.

To facilitate definition of the future clinical role of the hospital pharmacist, the services encompassed by clinical pharmacy need to be defined and agreement reached within the

profession on those that should be provided. This task should be informed by data on the current provision of services, their effectiveness and the need for these services. Pertinent changes in the health care environment must be taken into account since the services must meet the needs of patients in the new NHS.

CHAPTER II

CLARIFICATION OF THE RESEARCH ISSUES

2.1. Introduction.

Several official UK documents[2-7], including Department of Health circulars[2-4], describe the clinical role of the hospital pharmacist. The Way Forward[2-4] assumed that hospital pharmacists were providing certain services, namely routine review of prescriptions, drug information, guidance on and preparation of products requiring assembly for specific patients, and maintenance of systems to encourage rational and economic use of medicines. It also recommended the development of several more services. The extent to which these, or the roles recommended in other documents[5-7], had been adopted had not been ascertained in 1992.

An initial literature review examined the professional status of pharmacy in the UK and factors that may modify the extent to which pharmacy has become professionalised[56]. It revealed that pharmacy was considered to be limited occupationally by the medical profession but that the professional status of pharmacy, especially in the hospital sector, was changing as a result of the development of clinical pharmacy among other factors. Clinical pharmacy, by contributing to the development of a body of expert and indeterminate knowledge, could professionalise hospital pharmacy. It could also lead to fragmentation with resulting deprofessionalisation. Although further factors, primarily the National Health Service (NHS) reforms[16], and general changes in professional roles and in society, could de-professionalise pharmacy, due to increased managerial power, encroachment by new professions and patient empowerment, or could professionalise pharmacy, consequent on the development of new roles, it was concluded that clinical pharmacy was the pre-eminent influence. It was considered to be the principal means for pharmacists to expand their territory, increase their professional status and further professionalise in the changing hospital health care environment in the UK[56].

The views of various pharmacy and multidisciplinary groups on the clinical services that hospital pharmacists should provide are described in official documents[2-7]. Some of these roles, such as patient education, are subject to interprofessional competition, specifically with nursing, medicine and professions allied to medicine, but criteria do not exist for the allocation of these disputable roles. Additionally, the views of other health professionals, managers and consumers of hospital clinical pharmacy services are important but may not have been considered in deciding service provision. The opinions of hospital pharmacists on clinical pharmacy roles may not accord with the roles depicted in official documents and it cannot be assumed that pharmacists have adopted their recommendations. It has been

postulated that hospital pharmacists expanded their role based on factors other than official publications[56]. If so, the constraints on, and the facilitators of, clinical pharmacy service development need examination.

In essence, what are the real issues surrounding the development of the clinical role of the hospital pharmacist in the UK? To clarify these issues, and thus define the aims of the research, some preliminary interviews and other groundwork were carried out.

2.2. Methods.

Interviews were conducted with pharmacists, conferences and meetings were attended, and literature was obtained on the clinical pharmacy services that were provided at a variety of hospital pharmacies in 1992. Further ideas were obtained from various official documents defining services and standards for their provision.

2.2.1. Interviews with Pharmacists.

Hospital pharmacists, representing a range of backgrounds and interests, were interviewed by the researcher at the interviewee's workplace during informal visits. Interviewees were given prior notice of the interview. Interviews usually lasted 1-2 hours and were unstructured[73] to allow the interviewee to highlight topics that they thought were important in current clinical pharmacy practice. The following themes were, however, introduced in all interviews:

(i)   What do you see as the role of the clinical pharmacist in hospitals at present? / What clinically-orientated activities do hospital pharmacists carry out at the moment?

(ii)   How useful are these services in ensuring optimum patient care? / How valuable are these functions in the overall provision of good patient care?

(iii)   Are there other roles or functions which you see as important that are not being provided at present? / Are there any services that are not provided at the moment but which you think should be provided?

Interviewees who mentioned specific services/roles/functions were also asked:

(iv)   Why do you think pharmacists are not providing these services? / What barriers are preventing pharmacists providing these other services which you think should be provided?

Notes were taken during the interviews and a written record was completed immediately afterwards. Key words were extracted from these and formed into themes[74] grouped according

to the questions.

2.2.2. Information Obtained at Conferences and Meetings.

Information was gathered informally from participants at various conferences and meetings. Notes were taken during lectures and presentations and during, and immediately after, conversing with leading hospital pharmacists on the topics listed in Section 2.2.1. Although these notes were less complete than those taken at the interviews described in 2.2.1., they were analyzed similarly.

2.2.3. Information Gathered from Other Sources.

Information on clinical pharmacy services being provided in 1992 was obtained from the pharmacy service plans of a number of hospitals and from various service standards documents. Analysis was carried out as described in Section 2.2.1.

2.3. Results.

Data obtained at interviews, conferences and meetings are presented together.

2.3.1. Data Gathered at Interviews, Conferences and Meetings.

Sixteen pharmacists were interviewed individually, including regional pharmacy specialists (2), pharmacists at teaching (8) and district general hospitals (4) and community services pharmacists (2). Two pharmacists were interviewed by telephone. Other pharmacists were consulted during the following conferences/meetings:

1. United Kingdom Clinical Pharmacy Association annual conference, Blackpool (November 1991)

2. British Pharmaceutical Society conference, Liverpool (September 1991).

3. Forum on Clinical Pharmacology & Therapeutics. "Doctors, Drugs and Pharmacists", London (December 1991).

4. Department of Health Pharmaceutical Division. Meeting to exchange views on clinical pharmacy practice in the UK and the USA. London (August 1991).

5. Department of Health Pharmaceutical Division. Pharmacy Enterprise Award recipients study day. London (September 1991).

6. Guild of Hospital Pharmacists Management Symposium on Quality Assurance. London (August 1991).

2.3.1.1.   Present role.

Many pharmacists felt that there was a need to define clinical pharmacy and that the definitions provided in official literature[27] were not universally accepted. *"It depends on what you mean by 'clinical pharmacy' .. you will have to define that if you want to ask people about it"*. Pharmacists provided several different definitions of clinical pharmacy and the services that were included differed between definitions. Many felt that clinical pharmacists were members of health care teams. A pharmacist providing an adverse drug reaction (ADR) screening programme considered himself an independent consultant within a team framework and said *"I interview patients who are referred to me by the team with suspected ADRs"*. Pharmacist participation in patient education was also seen as a team effort, particularly for patients with specific needs such as transplant patients. Here pharmacists happily take responsibility and credit for their contribution to patient care. *"We document our recommendations in the notes if it's important .. I usually only record answers to DI (drug information) type queries in the notes"*.

Specialist clinical pharmacy services, such as advising on total parenteral nutrition (TPN), therapeutic drug monitoring (TDM) and central intravenous additives (CIVAs), were emphasised. Although the latter was a manufacturing service one interviewee said it *"is part of clinical pharmacy .. it reduces inaccuracies in IV* (intravenous) *administration .. anyway it's part of the drug use process"*. Monitoring of individual patient's therapy for therapeutic effect, lack of effect and adverse effects, was considered central to clinical pharmacy since it ensured the appropriateness of prescribing and economic use of medicines. Pharmacists' influence on prescribing was mentioned frequently. They could act in an advisory capacity making recommendations on prescribing and administration for individual patients and on *"appropriateness of dose..I'd check if it's the best choice"*. Advice was provided also on new drugs, for the creation and assessment of drug policy (by helping create therapeutic protocols and formularies and carrying out drug utilisation review (DUR)), and on individual patient's therapy. Pharmacists felt that there were ample opportunities to become involved in the health care team and their advice was respected within it. *"There is a lot of opportunity for input on a ward round .. the staff all treat us as part of the team"*.

Clinical pharmacists provided certain services directly to patients. Drug history-taking was one such service but it was provided *"especially if doctors request it"*. Pharmacists sometimes acted on their own initiative and had created patient profiles containing information on drug

therapies and disease *"for my own use"*. Input to patient self medication programmes, patients counselling and patient education was considered an important part of their role. The patient was the focus of such activities. *"You've got to be available to discuss things with the patient"*. Clinical pharmacists were thought to have a role in facilitating the movement of patients from secondary to primary care. *"We liaise between the hospital and the community .. can help on the clinical side if necessary .. especially for problem patients"*.

Most pharmacists thought that clinical pharmacists should provide education and training for pharmacists and non-pharmacist health care professionals, such as doctors (on prescribing and clinical pharmacy services), nurses (on drugs and their administration) and physiotherapists (on the pharmacology of drugs administered via inhalers). It was thought that clinical pharmacists could contribute usefully to medical student teaching programmes and those for nurses at local and regional level; more experienced clinical pharmacists could provide training for pharmacists in specialist areas of clinical pharmacy. Input to pharmacy training courses was viewed positively. Clinical pharmacists were thought to have a role as providers of drug information (in addition to the formal drug information service provided in many hospitals). *"Clinical pharmacists should do their own queries as much as possible"*. In addition, the provision of financial advice to directorates was a new and prominent role. The roles in practice research and clinical trials were mentioned. Clinical pharmacists could advise on clinical trials, help set them up and resolve technical difficulties.

Clinical pharmacists' role in the assurance of the quality of clinical pharmacy services was emphasised. *"Quality assurance of what we (clinical pharmacists) do is vital"*. Meetings for peer-review were reported to be common. Data recorded by pharmacists (on computers or in log books) were used to review ward pharmacists' activities at some sites. Clinical pharmacists' involvement in audit was a new and important role that included *".. all audit activities, not just patient-orientated but also service audit"*. *"We feed back to the doctor's audit sessions the information we have gathered from pharmacists interventions"*.

The Community Services Pharmacist's (CSP's) role was different to that of the traditional hospital clinical pharmacist. *"Community services pharmacists often don't get a chance to intervene and do work like what you might have done on the wards* (in hospital pharmacy) .. *we do a lot of advising and providing information on vaccines, going around to give talks in schools and mother and baby clinics"*

2.3.1.2. Evaluation of clinical pharmacists' present role.

Most pharmacists recognised the importance of role evaluation. Although few had performed any evaluations, many thought it imperative that pharmacists evaluate clinical pharmacy services and *"prove"* their effectiveness. Ward pharmacists, in particular, *"need to show that they are doing something worthwhile"*. *"Pharmacists will have to show clear benefits from what they are doing especially if they are introducing new services"*. One of the main stimuli for service evaluation was fear that, in its absence, pharmacy jobs would be jeopardised. *"Pharmacists need to prove that they are worth employing"*. *"Are we cost effective?"*. Pharmacists emphasised the difficulties in proving that clinical pharmacy services, especially those that have become well-established, are effective. *"We know we are doing the right sorts of things but you can't measure what the effect is* (on patients)*"*. *"There's a problem with clinical pharmacy ... there's no product so its hard to judge our effect"*. Service evaluation was difficult. *"Sometimes its easy to see clear benefits from doing what we are doing, say with new services we haven't done before"*. Outcome measurement was understood to be difficult and it was considered useful to evaluate process. *"Even if we can't measure their effect on patients we should be able to tell that they* (clinical pharmacists) *are doing their job well"*. Uncertainty about the definition of clinical pharmacy hindered evaluation. *"If we could all agree on what we should be doing we might stand some chance of finding out if we're doing it well"*. Pharmacists may hinder evaluation since they *"are poor at writing things down .. it's impossible to know if they are doing anything useful"*. It was recognised also that outcome measurement is difficult. *"We can't prove that we are changing outcome any more than they* (doctors and nurses) *can"*.

Clinical pharmacy services were considered to be demonstrably effective in certain areas such as in reducing drug expenditure. *"Pharmacists can save lots of money"*. *"We seem to do well in high cost areas but that wouldn't apply in geri's"* (geriatric medicine). Some pharmacists, however, expressed reservations about the value of other clinical pharmacy services. *"I personally don't think taking medication histories is doing the patient any good .. I think that you will still not pick up on adverse effects"*. It was suggested that customer satisfaction could be used as a proxy for effectiveness. Customers could be patients or health professionals who purchase pharmacy services. *"The other professionals working here think a lot of us .. we have become indispensable in some areas .. the nurses and doctors are used to getting .. services from us and will pay us to keep providing them"*.

2.3.1.3. Clinical pharmacists' potential role.

Many pharmacists had ideas on future role development. Pharmacists thought that specialist clinical services, such as TPN and home chemotherapy, should be developed. Services provided directly to the patient opened up potential new roles for pharmacists. Examples included drug history-taking, especially for patients with suspected adverse drug effects (ADEs) since it *"could help pick up on unnoticed ADEs"*, and the provision of education to help increase adherence to medication regimens. Pharmacists should also assure the quality of clinical pharmacy services. Clinical pharmacists functioning within a team framework was thought to be a significant advance. It was envisaged that they would soon take part in pain management teams and help chose therapeutic regimens for those using patient controlled analgesia (PCA). They could conceivably prescribe within guidelines in some areas, such as out-patient anticoagulant clinics and in-patient heparin therapy. They should become more involved in ADE detection, particularly for new drugs, not as the *"doctor's secretary"* but as a fellow team-member. Joint ventures with medical staff, such as participation in grand rounds, formulary developments and ADR schemes, were thought to be progressive and further headway could be made in drug therapy monitoring. Clinical pharmacists could assess drug therapy for out-patients on complex regimens.

Clinical pharmacists could play a role in the primary care sector by advising on general practice and joint hospital/community formularies. They could expedite the movement of patients from hospital to primary care by providing information on unusual prescribing habits of hospital doctors and by *"providing information on hospital prescribing policies to the local GPs* (general practitioners) *especially when one of our consultants uses weird 'specials' (novel or extemporaneous preparations)"*.

2.3.1.4. Perceived barriers to progress.

Within pharmacy, clinical pharmacists may create barriers to their own progress. The lack of definition of clinical pharmacy was thought to hinder service provision. *"We've got to stop trying to be doctors and know more about drugs .. we need to focus more on what we're trained to do"*. Lack of awareness of, or agreement on, the clinical role may be a dis-incentive to role expansion. *"We lack a definite role so, when in doubt, we tend to fall back on the supply function"*. *"We need agreement on role"*. *"We need to be aware of our role"*. Certain clinical pharmacy tasks may not be perceived to be important or exciting. Pharmacists *"do not check on drugs being given i.v. (intravenously) often enough, I suppose they think it's boring*

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and don't bother". Some pharmacists fail to detect opportunities for clinical involvement in the provision of routine services. *"Pharmacists have to get over their mental block about the dispensary .. if you can integrate a care group pharmacist with the dispensary team during the outpatient clinic times you can do all sorts of things .. we've started looking at patient counselling guidelines and prescription monitoring guidelines and it helps in audit too"*. Some thought that the reluctance to perform basic monitoring chores was due to a gap in pharmacist education; they *"need more appreciation of the problem(s) which may be encountered"*. Others said that the problem was due to clinical pharmacists being a *"jack-of-all-trades. We have got to specialise .. you can't be good at everything"*.

One of the most important barriers was pharmacists' attitudes. Pharmacists were perceived as being conservative and as failing to grasp opportunities. *"Pharmacists have got to see every problem as a potential opportunity"*. Fear of embarrassment and lack of assertiveness played a role in their reticence to venture into new areas. *"One bad experience could harm a junior pharmacist a lot"*. *"We have a fear of not being ok .. not quality enough to market ourselves"*. Pharmacists had often adopted the *"underdog position"* and had an unhelpful perception of the doctor. They may *"like patients, still view doctor as always being right"*.

Pharmacists were perceived as lacking some skills necessary for the promotion of clinical pharmacy although this was rarely due to a lack of clinical pharmacy skills. One pharmacist considered it vital that clinical pharmacists learnt about hospital politics. *"If they ask me to do something, it doesn't matter if I think it's probably not one of our roles or it can't be done .. or you might think that we shouldn't do it .. we'll give it a try .. then reassess .. often they will want us to keep providing the service .. it's a matter of getting your foot in the door. Then we can try other things nearer to what we might want to do"*. It was thought that pharmacists needed to learn how to provide constructive criticism and advice via written documentation but clinical pharmacists did not tend to record their advice in a prominent place. This made it difficult to demonstrate the value of their service. *"Pharmacists should be writing their recommendations in the notes not just telling the House Officer"*. This would necessitate *"training to ensure that what they wrote was appropriate and helpful"*. In addition, *"pharmacists are not good at putting their views across concisely or thinking on the spot"*. Ward pharmacists were seen as *"ambassadors for the clinical service"* but it was there was concern whether all pharmacists possessed the necessary skills or were sufficiently experienced. *"There's a big risk in sending junior pharmacists out .. there's a huge personal*

factor involved". Their lack of communication and social skills was thought to have inhibited progress. *"They just aren't assertive enough and they don't follow problems up"*. When contacting doctors *"they don't make their case well enough"*. *"They must learn to negotiate"*. New forms of training were thought to be required. *"We need to change training so pharmacists give the right answer when put on the spot"*. There was concern also that training was inadequately assessed. *"Pharmacy managers need to assess the improvement in their staff's performance following educational efforts"*.

Organisational factors in pharmacy were thought to have impeded the growth of clinical pharmacy. The organisation of the pharmacy workforce was felt to be a barrier to new role development. *"In many hospitals it's not possible to employ specialist clinical pharmacists at the higher grades .. Grade F and G pharmacists would be getting more and more into the management side .. it's a pity really"*. In a few hospitals some pharmacists spent the majority of their time on clinical pharmacy activities whilst others spent most of their time in non-clinical areas of pharmacy. A non-clinical pharmacist from such a centre, however, commented *"It's not a bad thing to have different pharmacists working in the dispensary, for instance, and others on the wards doing the clinical stuff .. it's the best people for the job doing the job .. then everyone's happy and it's better if you're trying to run an efficient drug supply service"*. Important efficiency questions require answers and services may need to be re-organised to increase pharmacists' knowledge of patients and their contact with medical staff. *"We are not pro-active enough .. we often don't know enough about the patient"*. *"We need to decrease organisational problems so doctors and pharmacists meet on the wards more"*. *"We need to have pharmacists dedicated to teams or wards"*. The retrospective nature of prescription monitoring meant that *"patients with problems aren't referred* (to a pharmacist) *.. the doctor makes up his mind on his impressions .. it's very hard to change things later, say if you're trying to get a dose changed"*.

Pharmacists' neglect of the needs of customers had impeded service promotion. Clinical pharmacists should, it was thought, attempt to assess customers' (health professionals or patients) needs and heed their views when deciding on service provision. *"Pharmacy managers need to concentrate on their staff's and their customers' perceptions and expectations of the service .. we arrange to talk to Clinical Directors, clinicians and patients .. fairly unstructured interviews, say about half an hour, and we ask them questions .. establish if pharmacy is providing a service that fits their needs"*. An analogy was drawn with marketing. *"It's what*

the customer thinks is really important .. much more so than what the pharmacy thinks .. it's like marketing in a lot of ways". Market research was thought to be required to elicit those services which doctors want and to facilitate marketing of services to managers. There is a *"need to assess customers' needs .. then promote ourselves in that role to management".* Attitudinal barriers were thought to be significant. Pharmacists are sensitive about perceived transgressions of professional boundaries. *"In some areas, say in the management of pain, they* (pharmacists) *may feel that they are interfering with nurses roles but we're far more afraid of doctors".*

Many pharmacists mentioned lack of resources (money, staff, time) as a barrier to service provision. The lack of sufficient numbers of senior pharmacists working on wards meant that many ward pharmacists were inexperienced and were *"not picking up on drug problems in time".* This hindered promotion of clinical pharmacy as a consultancy service. Other resource constraints were time-consuming training commitments and staff turnover. High turnover increased the training burden and, in London, was considered to have caused promotion beyond competence. *"Staff turnover was too high* (because of the increased opportunities and the difficulty in retaining staff in London) *and pharmacists were promoted faster than they should have been considering their experience".*

Barriers outside pharmacy included the existence of interprofessional conflict and feelings of lack of acceptance by doctors. *"We still need to prove our worth if they don't know us .. once you're in and accepted you can do so much more".* *"Pharmacists are judged from their* (doctors) *personal exposure to us .. the range of pharmacists just isn't realised .. one bad experience, say working in a hospital with a poor pharmacy department, could colour their attitude for a long time".* General lack of promotion of clinical pharmacy was considered to have hindered service expansion. There was a perceived need to educate doctors and nurses about the clinical services that pharmacists could provide. *"It's ok in specialist areas like AIDS* (Acquired Immune Deficiency Syndrome) *but with general 'medics' you've got to promote yourself to lots of people".* We *"need to promote ourselves to nurses".* It was felt that challenges to clinical pharmacy exist from general management's preoccupation with saving money at the expense of quality services. *"Managers need to change their ideas on how to judge our performance .. it's important to look at quality of life too .. but the number one criterion is still cost".* There was also a need to educate customers in primary care about the availability and range of clinical pharmacy services. *"CSPs might contact the GP .. and the*

GPs would hardly ever contact CSPs".

2.3.2.Data Collected from Other Sources.

Service plans from a number of leading hospitals[a] and documents describing standards for, and quality assurance of, clinical pharmacy services[b,35,36,75,76] were examined. There were marked differences between the service plans despite similarities in the hospitals. The data in the services plans and standards documents were used to construct a list of currently provided and potential clinical pharmacy services (Table 2.1).

2.4.   Summary of Results.

This preliminary research confirmed that clinical pharmacy was interpreted differently by different pharmacists and that its practice varied. Hospital pharmacists have adopted numerous clinical roles many of which were not recommended by the Department of Health[2-4] although some were described in other documents[5-7]. The services that pharmacists described as clinical pharmacy differed. This is unsurprising since official documents vary in their definition of clinical pharmacy. It may also reflect disagreement, within pharmacy, on the meaning of clinical pharmacy. The roles that had been adopted were not synonymous with those to which pharmacists aspired; those to which they aspired were diverse and were not clearly guided by government policy[2-4]. Ambitions regarding future clinical roles were tempered by a recognition of barriers to change, particularly those in pharmacy consequent on pharmacists' attitudes, their lack of certain skills, their neglect of customers' opinions and the failure to promote and evaluate their services. It was thought that pharmacy should become involved in needs assessment, market research and service evaluation to aid development of appropriate services.

a.   Personal communications (1991):
   (i)   Baker J. Medicines are our business. Riverside Pharmacy Service. Service Specification 1990-1.
   (ii)   Marshall IW. St James's University Hospital Leeds. Pharmacy Service Plan 1991/92.
   (iii) Wind K. Pharmacy Services at Southend Hospital, Southend, Essex.
   (iv)   Cousins D. Pharmacy Services at Derbyshire Royal Infirmary, Derby.
   (v)   Clarke C. Pharmacy Services at Hope Hospital, Salford, Manchester.

b.   Personal Communication, Wilson P (1991).
   (i)   Documents from the "White Hart" Seminar on Quality and Performance Measures.
   (ii)   Key Standards of Service for Pharmacy and their Quality Indicators, North East Thames Regional Health Authority.

Table 2.1.   Clinical Pharmacy Services Currently Provided by Five United Kingdom National Health Service Hospitals and Listed in Various[2] Documents.

Service Plans[1]	Standards Documents[2]
Prescribing evaluation Drug Utilisation Review (DUR) and DUR research Prescription monitoring (ward pharmacy)	**Prescribing evaluation** DUR of prescribing by consultant firms and in high cost areas, and monitoring its impact on prescribing Prescription monitoring within national guidelines including ward pharmacy Regular visits to wards at appropriate intervals, therapeutic drug monitoring, adverse drug reaction (ADR) and prescription monitoring, counselling, medication histories, information on financial and clinical use of drugs Liaison with other ward staff Contribution to medication regimen choice and dosage calculation
Policy making Preparation of prescribing policy Preparation and/or assessment of formulary submissions Formulary creation and management	**Policy making** Representation on Drug and Therapeutics Committee Involvement in formulary preparation, update & adherence monitoring Responsibility (with other disciplines and professionals) for ensuring policies exist in certain areas, such as prescribing, trials, antibiotic and disinfectant use
Education In-house education and training University-accredited training schemes Training for hospital and external pharmacists (under and post-graduates) Lectures for other hospital and non-hospital health professionals (general practitioners, medical and nursing students, hospital doctors and nurses). Bulletins and newsletters for use within and outside the hospital	**Education** Training programmes for pharmacy staff Active participation in education of other health professionals
Research Research with other hospitals and disciplines, and with University personnel Ethical committee role Assessment of clinical trials & unlicensed products **Out-of-hours pharmacy services** Residency service	**Research** Clinical trials, ethics assessment, trial drug supply, record keeping, information and patient counselling Performance of practice research
Quality Assurance Participation in medical and clinical audit	**Quality Assurance** Audit of all aspects of pharmacy services Audit of Community Service Pharmacy

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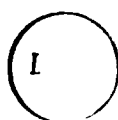
Table 2.1 continued.

Service Plans[1]	Standards Documents[2]
Information provision	**Provision of information**
General drug information and advice	Clinical and cost assessment information
Financial information on drug use	Drug information, evaluation of products,
Information for resource management	Regional and National material
Formal drug information service at local,	Advice on clinical use of dressings and
Regional or National level	wound management materials
Pharmacists in the Health Care Team	**Specialist clinical services (some as Team-**
ADR detection and reporting	**worker)**
Consultant ward rounds	Parenteral Nutrition - part of nutrition
Preparation of, and advising on, cytotoxic	teams
therapy	Cytotoxic preparation service - advising
Specialist clinical services	on safe use of cytotoxics and dosing,
Radiopharmacy	provision of safe use guidelines, control
Manufacturing extemporaneous products	of expected adverse effects, etc.
and specials	Central intravenous additive service -
Aseptic dispensing and total parenteral	information and advice on doses
nutrition services	Radiopharmacy - education of health
	professionals and pharmacists on safety
	and research
	ADR monitoring - ensuring reports
	made and corrective action taken,
	provision of information on ADRs
	Medication histories taken on request for
	some patients
	Therapeutic drug monitoring service
Services provided directly to patients	**Services provided directly to patients**
Pre-discharge counselling	Patient or (carer) counselling including
Information and advice for out-patients	provision of supplementary written
	information
Services to the Primary Care Sector	**Services to Primary Care Sector**
Information and advice for community	Provision of information and advice to
health professionals	staff and appropriate clinical services for
Clinical pharmacy services for patients at	community-based units
home, in community clinics and	Allocation of a pharmacist dedicated to
nursing homes	the special needs of the community who
	makes a contribution to disease
	prevention and treatment, educational
	activities for health care professionals,
	patients and the public
	Contribution to health education
	activities in policy formulation
	Provision of information and education as
	part of community health education
	programmes

Notes to Table 2.1:

1. Five service plans named in footnote a were examined.
2. Six standards documents were examined namely those in footnote b and references 35,36,75,76

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This should be accompanied by service promotion and customer education about services. Increased documentation of activities and enhancement of pharmacists' communication skills were also emphasised.

2.5.   The Aims of the Project.

Preliminary investigations revealed that the clinical roles that hospital pharmacists have assumed in UK NHS hospitals were diverse, unevaluated and unconstrained by official[5-7] or government[2-4] recommendations, or consumer opinion. It was necessary to measure the extent of this variation, consider evaluative data on hospital clinical pharmacy services, and examine the forces that are important to the development of hospital clinical pharmacy in the UK. These forces included pharmacists' aspirations, customer need, government recommendations and the requirements of a reforming NHS.

The aims of the project, shaped by preliminary research and literature reviews were to:

(i)   ascertain the clinical roles that hospital pharmacists have adopted in the UK;

(ii)   discover the extent to which these reflect official descriptions of clinical pharmacists' roles;

(iii)   summarise the results of evaluative research on hospital clinical pharmacy roles;

(iv)   determine the views of providers and professional recipients of hospital clinical pharmacy services on present roles and future role development;

(v)   elucidate reasons for roles already adopted and perceived barriers and facilitators to role expansion.

(vi)   create useful models of clinical roles for hospital pharmacists in the reformed NHS to guide service development.

These aims generated several research questions.

2.6.   The Research Questions.

Information on the clinical roles that UK hospital pharmacists have adopted could be elicited from service data provided by practising pharmacists. The study focused on the NHS since most hospital pharmacies work within it[77]. Omission of private hospital pharmacies was not considered detrimental since few pharmacists work there[78] and personal contact with private hospital pharmacies showed that the clinical pharmacy service mix was usually similar to,

although often more limited than, that in NHS hospitals. Furthermore, financial constraints and logistics deemed it necessary to restrict the scope of this research to NHS hospital clinical pharmacy. The research question was *"In practice which clinical services do pharmacists provide in UK NHS hospitals?"*. This could be addressed by a nationwide survey of UK NHS hospital pharmacies.

Initial research revealed that hospital pharmacists have adopted many roles not described in The Way Forward[2-4] or other official UK documents[5-7]. To determine to what extent the roles adopted by UK NHS hospital pharmacists reflect official descriptions of clinical pharmacists' roles, the recommendations of official documents need to be compared with the roles that hospital pharmacists have adopted in practice. The second research question contained two parts, *"What are the clinical roles envisaged for hospital pharmacists in UK government and other official documents?"* and *"To what extent are these recommendations in agreement with the clinical roles that have been widely adopted by UK NHS hospital pharmacists?"*. A literature analysis would answer the first part; analysis of data generated from official documentation and from the nationwide questionnaire mentioned above would answer the second part.

An initial literature review, interviews of those responsible for the formulation of The Way Forward[2-4] and the preliminary research described earlier in this chapter confirmed that hospital clinical pharmacy services have not been evaluated thoroughly. To summarise the results of evaluative literature on the clinical roles that UK NHS hospital pharmacists have adopted, literature on the economic and clinical effectiveness of clinical pharmacy services would be appraised to answer the questions *"Does it make economic sense to provide this service?"* and *"Is this service effective?"*. The literature appraisal was restricted to English language documents for practical and financial reasons.

Preliminary research revealed that hospital pharmacists had not sought the views of their professional customers when deciding on service development and many identified this as a key barrier to role development. In addition, the views of pharmacists on the future development of hospital clinical pharmacy were unknown. To discover the views of practising pharmacists and other professionals working in secondary care on the present and future clinical role of the hospital pharmacist, a number of research questions were posed about clinical pharmacy services. *"What are the perceptions of hospital pharmacists and their*

professional customers on the usefulness of hospital clinical pharmacy services?". "What are the clinical pharmacy service requirements of these customers?". "What are hospital pharmacists' aspirations regarding their future clinical role?". An interview survey would obtain views on services from which roles could be created. Financial and time constraints demanded that it be carried out on a sample of pharmacists and professional customers in selected NHS hospitals. Non-professionals customers views were important but elucidation of their views was beyond the scope of this study.

A literature review on professionalising influences on UK hospital pharmacy[56] indicated that pharmacy may be limited by the medical profession and that the development of clinical pharmacy was pre-eminent among the factors that may be changing hospital pharmacy's professional status. Preliminary interviews provided evidence that pharmacists felt hampered in the development of clinical pharmacy services by barriers within and outside pharmacy. Some had overcome these barriers and mentioned facilitators to role development. To elucidate reasons for roles already adopted and perceived barriers to role expansion, two research questions were created. *"Why have hospital pharmacists adopted their present roles?" "What barriers and facilitators exist to role development?"* These could be answered using the data from the interview survey already mentioned. Interviews could focus on services and role issues could be inferred from the data.

To create useful models of future clinical roles for hospital pharmacists in the reformed NHS all the data gathered in the research will be amalgamated to answer the question *"Which clinical pharmacy roles will facilitate the provision of care in the reformed UK NHS?".* Data from different aspects of the research could be merged in a number of ways but time, methodological issues and resources influenced the choice (see Chapter III). The resulting role models could be used to guide service development.

2.7.   Summary.

Several UK documents provide definitions of clinical pharmacy and outline the clinical role of hospital pharmacists[2-7]. Their effects on the development of clinical pharmacy in UK NHS hospitals are unknown but preliminary research indicated that their definitions and recommendations may not have been universally accepted. Recent NHS changes[16] have altered the hospital health care environment and hospital pharmacies are now providing services to

cu.tomers, within and outside the hospital. The shift in emphasis to primary care[1] has affected the funding and direction of hospital pharmacy services. These changes have important implications for hospital clinical pharmacy services which are poorly defined at national level, on whose provision few data exist and about which pharmacists feel little evaluation has been performed. There is also little information on hospital pharmacists', or their customers', views on hospital pharmacy services. To facilitate the creation of hospital clinical pharmacy services appropriate to the needs of the NHS in the 1990s, and for pharmacists to shape their future role, there is a need to define the services currently provided, to determine their value and appropriateness and the factors influencing their provision, and to create models of the future clinical role of the UK NHS hospital pharmacist. This will facilitate the development of hospital pharmacy services that will contribute to quality patient care.

The aims of the project were expressed as several research questions which determined the methods. A nationwide survey of UK NHS hospital pharmacies would be undertaken followed by interviews with a sample of pharmacist and non-pharmacy health care professionals from some of these sites. Evaluative literature on clinical pharmacy services would be reviewed and data gathered in all sections of the project would be combined to provide models of the future clinical role of the UK NHS hospital pharmacist.

CHAPTER III

METHODS

3.1. Introduction.

Preliminary work raised and clarified several research issues and generated the aims and objectives of the project. The objectives were:

(i)   to ascertain the clinical roles that hospital pharmacists have adopted in the UK;

(ii)   to discover the extent to which these reflect official descriptions of clinical pharmacists' roles;

(iii)   to summarise the results of evaluative research on hospital clinical pharmacy roles;

(iv)   to determine the views of providers and professional recipients of hospital clinical pharmacy services on present roles and future role development;

(v)   to elucidate reasons for roles already adopted and perceived barriers and facilitators to role expansion.

(vi)   to create useful models of clinical roles for hospital pharmacists in the reformed NHS that will guide service development.

The research questions generated by these objectives were described in Chapter II. It was decided to limit the scope of the research to UK NHS hospital pharmacies and the methods were selected. A questionnaire survey, a review of the literature and an interview survey were chosen to satisfy objectives (i), (iii), and (iv) and (v) respectively. This chapter describes the methods and the rationale behind their choice in detail.

3.2. Postal Questionnaire Survey.

3.2.1. Rationale for the Choice of Method.

A survey would elicit which clinical pharmacy services were being provided by hospital pharmacists. The preliminary work (Chapter II) indicated that there was wide variation in the provision of hospital clinical pharmacy services. It was anticipated that selecting a representative sample would be difficult so it was decided to survey all UK NHS hospital pharmacies where a pharmacists was present during normal working hours and services, in addition to drug supply, were provided[c]. This excluded hospitals that did not have their own pharmacies but received a visiting pharmacy service or operated as part-time satellites of other hospital pharmacies. The choice of method lay between questionnaire and interview surveys. A postal questionnaire method was selected due to resource constraints even though it would reduce the depth of information obtained.

c   This was designated "a comprehensive pharmacy service".

A postal questionnaire survey would be less time-consuming and cheaper to administer than an interview survey and would permit nationwide coverage. Some of the information sought in this study required respondents to collect data on the work done in their pharmacies that was not immediately available. This type of information is more suited to collection by questionnaire[79]. Questionnaires ensure uniformity of questioning and avoid interviewer effects. Spontaneous answers were not required in this study hence a questionnaire survey was acceptable[79]. There is evidence also that the answers obtained by postal questionnaires are more reliable than those obtained at interview[79]. Questions in postal questionnaires need to be simple and clear[79]. Care was taken to define terms since initial interviews showed inter-pharmacist differences in the interpretation of clinical pharmacy. Questionnaire surveys preclude clarification or augmentation of replies and limit the depth of information collected compared to interview surveys[79]. In this study, the in-depth information was obtained at later interviews.

3.2.2. Steps Taken to Maximise the Response.

The potential for a low response rate was a concern since that to a questionnaire study on United States (USA) clinical pharmacy services (with no follow-up of non-responders) was only 66%[80]. Three factors are thought to affect response rate: sponsorship; subject; and population[79]. This research was sponsored by a respected institution and funded jointly by North West Thames Regional Health Authority (NWTRHA) and the Department of Health (DoH). Response rate may be reduced by a long questionnaire, awkward questions and no obvious benefit for the respondent[79]. Pre-testing of the questionnaire would reduce these problems but no inducements were provided. It was hoped that the altruistic reward of increasing the knowledge of their own profession would be sufficient. The population under study were professional and well-educated thereby eliminating the possibility of a low response rate due to poor education[79]. To enhance the response rate in this study, questionnaires were sent to named pharmacists in UK NHS hospitals. The names were obtained from District Pharmaceutical Officers (DPhOs) and their equivalents[d] since information in publications such as the Chemist and Druggist directory was outdated. Reminders enhance response rate[79] and were sent at intervals that permitted busy senior pharmacists time to complete the questionnaire. Where necessary telephone reminders were

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d   District Pharmaceutical Officers (England), Chief Administrative Pharmaceutical Officers (Scotland and Wales), Directors of Pharmaceutical Services (Northern Ireland) and Chief Pharmacists (Special Health Authorities).

used. Questionnaires were numbered to allow follow-up and, in the event of a low response rate, to provide information on the characteristics of non-responders. Confidentiality, not anonymity, was assured since evidence suggests that anonymity is not a major issue in non-response[79]. The risk of successive reductions in the quality of replies was not thought to be high. An 85% response rate was considered necessary to provide a comprehensive picture of the clinical roles that pharmacists had adopted. A postal questionnaire may not be completed by the potential respondent but the factual nature of the questionnaire minimised any potential adverse effects of its completion by a person other than the named respondent.

3.2.3. Design and Pre-testing.

The questionnaire was designed using the results of the preliminary research. It was pre-tested by pharmacists from England and Wales and revised based on their comments and those of senior pharmacists in Scotland and Northern Ireland, social scientists and health service researchers. There were three focus group sessions[73] and three postal pre-tests.

3.2.3.1. Conduct of pre-testing.

Participants were contacted initially by telephone and were subsequently sent a draft questionnaire which they were asked to complete and comment on (Appendix II). A letter of thanks was sent later (Appendix II). Where necessary, postal participants were consulted to clarify vague comments. Members of focus groups were chosen to be of similar background and status, and acquainted with one another. They were seated in a circle to facilitate dialogue. The researcher acted as the facilitator and recorder (although ideally separate people would have performed each function[73]), introduced sessions and encouraged participation but did not offer opinions. Criticisms and ideas for improvement were obtained. Information was solicited on other topics of importance to the survey and on surveys that might help in the design or validation of the questionnaire. The interactive focus group sessions stimulated many comments and suggestions. Verbatim notes were taken during sessions and a report was written immediately afterwards. All major points were confirmed with participants during, or at the end of, the session.

3.2.3.2. Results of the pre-tests. (see Appendix III for a fuller account).

The first draft was considered by a focus group of six DPhOs from NWTRHA. It provided useful insights on managers' reactions to questions in areas of perceived sensitivity. The group interacted reasonably well but two participants assumed a dominant role while one was

reticent. Insufficient advance notice and personality differences may have contributed to this. Question wording was changed to reduce the potential for respondents reacting in a defensive fashion to questions, especially those on services that may be provided infrequently. The prospect of two questionnaires being required was noted since participants thought that a single respondent would not know the answers to all the questions. Group members often misunderstood questions and the reasons for asking them and frequently adopted an exclusively managerial viewpoint. As a result, greater care was taken in subsequent pre-testing to use participants more similar to prospective respondents.

The extensive expertise of three regional clinical pharmacy specialists in NWTRHA was used in a postal pre-test of the second draft. Demographic questions were moved to the beginning of the questionnaire since they would facilitate the answering of subsequent questions. Several questions containing more than one idea were expanded into two or more parts or questions. On their suggestion, a sociologist was consulted to make the wording of questions friendlier. The use of questions from an American questionnaire[e] was abandoned because they were considered to be too detailed and would discourage replies. Questions were simplified and most now contained closed and open sections.

Eight senior hospital clinical pharmacists from different parts of England and Wales took part in a focus group session and six London-based hospital clinical pharmacists with a Masters of Science (MSc) in clinical pharmacy completed a postal pre-test of the third draft of the questionnaire. All had management responsibilities and were chosen because they resembled closely potential respondents. The two hour focus group session worked very well with even participation by all. Four members continued the discussion for a further hour and conversations lasting about 30 minutes were conducted individually with two participants. Major criticisms of this draft included its excessive length, their inability to answer some questions due to lack of knowledge or information, misunderstanding of certain questions or terms, excessive use of open-ended questions and lack of discrimination between different levels of service provision. As a result, two questionnaires were created, one to be sent to DPhOs and their equivalents and the other to the pharmacist responsible for clinical pharmacy services in individual hospitals. DPhOs were given the option of delegating completion of the questionnaire to a more informed respondent if appropriate. All superfluous questions were omitted, the remainder being allocated to the two, now shorter, questionnaires. It was hoped

e   Personal Communication: CA Rhael, 1991.

that the reduction in depth of information requested would be offset by an enhanced response rate. In-depth information would be obtained at interviews.

The questionnaire was printed on fewer pages resulting in the loss of a column previously intended for use in coding. In this "miracle of miniaturisation" each question inquired about a single topic. Most questions were closed but included an open section. A few open questions were retained and placed at the end of the questionnaire. Question wording was further simplified and definitions were provided where terms or concepts were open to misinterpretation. Some questions were made less specific or omitted to prevent collection of inaccurate data. Others were extended to elicit more detailed and accurate information on service levels. Discrimination was achieved by providing categorical reply scales such as, none, very little, a moderate amount and lots.

Questionnaire I was pre-tested by two specialist pharmacists (postal pre-test), a sociologist (individual meeting) and a number of health service researchers (group and individual meetings). A few minor changes were made in wording. Questionnaire II was pre-tested by six senior hospital clinical pharmacists (postal pre-test), a sociologist and health service researchers (group and individual meetings). The wording of some questions was changed and terms in one categorical scale were defined.

3.2.3.3.   Other information used in designing and pre-testing the questionnaires.
For logistical reasons the questionnaires were pre-tested by pharmacists from England, Wales and Special Health Authorities (SHAs). A senior pharmacist in Northern Ireland was contacted to advise on questionnaire suitability. He suggested that information be obtained on services provided by hospital pharmacies to primary care from individual hospitals and Directors of Pharmaceutical Services (DPSs) since primary and secondary care services were more integrated in Northern Ireland than in the remainder of the UK[f]. The questionnaire sent to Northern Irish hospital pharmacies was changed to include questions 1-6 from the questionnaire sent to DPSs (Appendix IV). Hospital pharmacy services in remote parts of Scotland may differ from those provided elsewhere in the UK. Senior Scottish pharmacists[g]

f   Personal Communication: N Morrow, 1991.

g   Personal Communications:
         (i)   J Cromarty, 1991;
         (ii)   S Hudson, 1991a.

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and some Scottish Chief Administrative Pharmaceutical Officers (CAPOs) confirmed this but, because the number of such areas was small, advised leaving the questionnaire unchanged. Their advice was adopted.

Questions from the 1989 US National Clinical Pharmacy Survey[e] were considered but were found to be unsuitable due to differences in clinical pharmacy practice in the USA and the UK and the lack of very detailed information on service provision in UK hospitals. The US questionnaire provided ideas on question arrangement and acted as a check list for omissions in the researchers questionnaire. A questionnaire used in a survey of clinical pharmacy services in Lothian Health Board[h] also provided useful ideas on question wording. Differences in objectives, scale and complexity between the Lothian and this study made it impossible to use any of the actual questions.

3.2.3.4.   Changes in questionnaire content during pre-testing.

The initial questionnaire was 15 pages long. The final version consisted of two questionnaires; Questionnaire I contained 9 questions on 3 pages and Questionnaire II had 27 questions on 6 pages (Appendix IV). The version of Questionnaire II sent to Northern Irish respondents also included questions 1-6 from Questionnaire I due to the greater integration of primary and secondary care services in the province. The gradual expansion and change in question topics during pre-testing is illustrated in Table 3.1.

3.2.4. Reliability and Validity.

Reliability, a prerequisite for validity, is the ability of an instrument to measure consistently what it is designed to measure[81]. It encompasses repeatability, consistency, stability and accuracy, and consists of four types, test-retest, parallel forms, internal consistency and inter-rater reliability. Test-retest reliability is assessed by re-measuring the phenomenon under study using the same method following an interval during which no changes have been made to the phenomenon. The questionnaire survey was carried out in a period of rapid change in the NHS[16] and was not repeatable in a time period that would have precluded alterations in conditions. Parallel forms reliability was measured by comparing staffing data collected independently by an English Regional Health Authority (RHA) with that obtained by Questionnaire II (see Chapter IV). Internal consistency, measured by comparing the scores on groups of items in the measuring instrument, was not applicable to these questionnaires.

h   Personal Communication: S Hudson, 1991b.

Table 3.1.   Change in questionnaire content over time.

Topic	Drafts				
	1	2	3	4	5
Medication chart review	✓	✓	✓	✓	✓
Formulary	✓	✓	✓	✓	✓
Drug information	✓	✓	✓	✓	✓
Information provided (all sources)				✓	✓
Clinical trials	✓	✓	✓	✓	✓
Audit	✓	✓	✓	✓	✓
Methods of influencing prescribing	✓	✓	✓		
Attendance on ward rounds to influence prescribing				✓	✓
Drug utilisation review	✓	✓	✓		
Information on drug usage to clinical directors				✓	✓
Adverse drug effects monitoring	✓	✓	✓	✓	✓
Provision of education for pharmacy staff	✓	✓	✓	✓	✓
Provision of education for other hospital staff	✓	✓	✓	✓	✓
Provision of education on health/drugs for patients				✓	✓
Specific clinical services[1]	✓	✓	✓	✓	✓
Practice research	✓	✓	✓	✓	✓
Demography: Hospital teaching status	✓	✓	✓	✓	✓
Hospital management status	✓	✓	✓	✓	✓
Size - beds and wards	✓	✓	✓	✓	✓
Types of patient treated	✓	✓	✓		
Pharmacy staff	✓	✓	✓	✓	✓
Pharmacy opening hours	✓	✓	✓	✓	✓
Number of sites served	✓	✓	✓	✓	✓
No. clinical pharmacy specialists				✓	✓
Out of hours service	✓	✓	✓	✓	✓
Drug & Therapeutics Committee (DTC) present				✓	✓
Pharmacist representation on DTC		✓		✓	✓
Pharmacists role on DTC		✓			
Changes in pharmacy services in recent past & why		✓			
Effect of HC(88)54[2] on pharmacy resources	✓	✓		✓	✓
Effect of Nuffield Report[3] on pharmacy resources				✓	✓
Pharmacy's position in the management structure			✓	✓	✓
Holder of drug budget				✓	✓
Range of services to long-stay beds/units			✓	✓	✓
Prescription monitoring for long-stay beds				✓	✓
Services for general practitioners			✓	✓	✓
Services for primary care institutions			✓	✓	✓
Services for primary care patients			✓	✓	✓
Services for primary care professionals			✓	✓	✓
Services for primary care nurses			✓	✓	✓
Advisory/clinical service to community pharmacists			✓	✓	✓
Frustrations at work & suggestions for change		✓			
Views on the future of hospital pharmacy		✓			
Open question on views on clinical pharmacy				✓	✓

Notes to Table 3.1:

1.   Therapeutic drug monitoring, central intravenous additives, patient controlled analgesia, total parenteral nutrition and infection control;

2.   Department of Health. Health Services Management. The way forward for hospital pharmaceutical services HC(88)54. London: HMSO, 1988 and similar publications in Scotland and Northern Ireland;

3   Pharmacy The Report of a Committee of Inquiry appointed by the Nuffield Foundation (Chair- Sir K Clucas). London: The Nuffield Foundation 1986.

Inter rater reliability, which assesses the consistency of measurements made by different observers, was measured using duplicate replies from some sites (see Chapter IV). Factors that can affect the reliability of questionnaire surveys were considered. Questionnaire II was long hence there was a risk of bored respondents answering in a set manner just to finish[79] hence answers to the last few items were checked but no pattern was detected. Pre-testing helped remove factors which might reduce reliability, such as the social desirability of answers. Reduction in reliability due to researcher interpretation and coding of answers was prevented by repeating the coding in a blinded fashion. A data entry officer initially coded replies to Questionnaire I and the researcher repeated this. The researcher coded replies to Questionnaire II and repeated the process six to eight weeks later.

Only content validity was assessed. A questionnaire has content validity if it appears to measure the phenomenon it is supposed to measure (face validity) and contains items representative of all those that could have been included (logical validity). It was assessed during pre-testing using the expert knowledge of the researcher, other pharmacists, sociologists and health service researchers. Criterion-related validity is the capability of a method to predict a criterion measured at the same time (concurrent validity) or at future time (predictive validity). Construct validity is the extent to which a method measures a construct. It includes its ability to produce results that correlate well with those obtained by tests believed to measure the same construct (convergent validity) and poorly with those of tests measuring different constructs (discriminant validity). Neither criterion-related nor construct validity were relevant to the questionnaires in the survey.

3.2.5. Covering Letter Design and Pre-testing.

The covering letters were pre-tested at the same time as the questionnaires and advice was sought from a sociologist on optimal wording. Since the questionnaires would take a considerable time to complete and pharmacists had expressed fears about their confidentiality, the covering letter was used to explain the purposes of the study, to inform respondents of the approximate time required for questionnaire completion, to help allay anxieties about confidentiality and to emphasis the importance of the respondent's contribution to pharmacy practice research. Wording and tone are thought to be important[79] hence all letters were polite and clear and follow-up letters were humorous. Resource constraints precluded the incorporation of covering letters in the questionnaire. Sponsorship may affect response rate so covering letters were printed on London School of Hygiene and Tropical Medicine headed

notepaper, and the sponsors and academic supervisor were named. The subject was considered to be interesting to respondents but uncertainty following the 1989 NHS reforms[16] and threats to hospital pharmacy were emphasised to stimulate optimal response (Appendix V).

3.2.6. Respondents.

Questionnaire I was sent to DPhOs in England and their equivalents in the rest of the UK[d]. Their names and addresses were obtained from the Hospitals and Health Services Year Book and Directory of Hospital Suppliers[77] or the Health Authorities' offices. Questionnaire II was sent to the pharmacist responsible for clinical services in each hospital that provided a comprehensive pharmacy service[e]. Respondents to Questionnaire I were asked to supply the names of pharmacists and hospital addresses of those to whom Questionnaire II should be sent (Appendix II). Where there were discrepancies between the data supplied by these respondents and those available in the Hospital and Health Services Year Book and Directory of Hospital Suppliers[77], contact was made with respondents to clarify the situation. If they indicated that two or more hospitals were served by a pharmacy located at one hospital, respondents to Questionnaire II were asked to include information on staff at, and services to, all sites served by their pharmacy.

3.2.7. Posting and Follow-up Schedule.

The mailing patterns for both questionnaires were identical. Questionnaires were posted together with individualised signed covering letters and pre-addressed reply envelopes. Although resource constraints precluded the pre-stamping of reply envelopes, a deleterious effect on response rate was not expected since postage costs would be insignificant for individual hospitals. A postal reminder was sent six weeks after the initial mailing. It included another copy of the questionnaire and a follow-up letter. Non-responders were followed-up by telephone three months from the initial posting.

3.2.8. Data Coding and Entry.

Questionnaires were checked for completeness and excluded if more than 10% of questions were unanswered. Coding frames were created in advance and, for Questionnaire II, were revised after coding the first 100 and 300 replies (Appendix VI). This was because of difficulties in coding the answers to the open sections of some questions. Data editing was carried out at coding. Answers to Questionnaire I were coded at data entry but those to the more complicated Questionnaire II were coded on separate data entry forms. Replies to open

questions and sections of questions in both questionnaires were coded using key words[71]. Data were double entered into dBaseIV databases (Borland Inc., Scotts Valley California, USA) by a data entry officer and, subsequently, the researcher to ensure reliability, and the files were examined for inconsistencies. Key words were entered into a wordprocessing package.

3.2.9. Data Analysis.

Data were transferred into the Statistical Packages for the Social Sciences (SPSS/PC+, SPSS Inc., Gornichem, The Netherlands) where final cleaning was carried out. Data were analyzed using SPSS and Epi Info[82]. Since there was 100% coverage and high response rates (see Chapter IV) the results were treated as census rather than sample data.

3.2.9.1. Presentation of data.

Information from ordinal categorical variables was collapsed to form binary data (none and very little = not provided; a moderate amount and lots = provided) and described using frequencies. Continuous data were often positively skewed but no transformations were attempted to reduce skewness since inferential statistical tests are inappropriate for census data. Continuous data were displayed using histograms and summarised using the median, and first and third centiles.

3.2.9.2. Bivariate hypothesis testing.

A priori hypotheses, exploring the relationship between clinical pharmacy service provision (dependent variables) and demographic and resource variables (independent variables), were tested. For this, data on service provision were grouped according to values of the independent variable and the proportions of pharmacies providing service in these groups were compared. Most hypotheses involved two sets of binary data. The null hypotheses (H_0) was that no relationship existed between the dependent and independent variables. Between group differences in excess of 10% (or, in the case of infrequently provided services, in excess of a factor of 2) were taken to refute H_0 and were reported (Chapter IV). Historically, hospital pharmacy services have been managed differently in each of five NHS sections, namely England, Scotland, Wales, N. Ireland and the SHAs. Preliminary research suggested that this division influenced the development of clinical pharmacy services due to variations in the nature and implementation of DoH policy. Hypotheses were created to examine the effects of The Way Forward[2-4] and the Nuffield Report[5] since both had recommended the development of clinical pharmacy services and preliminary research indicated that some pharmacists

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thought they had aided service development. Both questionnaires had inquired if pharmacists thought that either document had changed resources for clinical pharmacy services. Data on clinical pharmacy service provision were then examined for associations with perceived changes in resources (Questionnaire I) or increases in resources (Questionnaire II). The hypothesis that location of pharmacies in NHS trusts could alter the provision of clinical pharmacy services, because trusts might be associated with a more proactive style of hospital management, was tested using data from both questionnaires.

Further hypotheses were tested using data gathered in Questionnaire II. It was hypothesised that location of pharmacies in teaching hospitals could have stimulated service development because of the greater demands made on them. It was thought that the presence of specialist clinical pharmacists[i], pharmacists with higher qualifications[j] or larger numbers of pharmacists would facilitate the provision of clinical pharmacy services due to greater numbers of, and more highly trained, staff. Although the results were census data and most statistical tests were inappropriate, continuous data were treated as a sample in time (as pharmacists numbers may change over time) to test for associations between numbers of pharmacists and the provision of services. The number of pharmacists employed was categorised into bands (1-3, 4-6, 7-9, 10-12, 13-15 and 16 or more pharmacists)[k] and a chi-squared test for trend (a priori level of significance = 0.05) was used to establish if the proportion of pharmacies providing each clinical pharmacy service increased or decreased with increasing numbers of pharmacists. H_0 stated that there was no difference in service provision between hospital pharmacies employing different numbers (groups as above) of pharmacists. The data satisfied the assumptions of the test, which are that not more than 20% of the expected numbers in the cells should be less than 5 and none should be less than one[84]. A clinical service score, representing the number of clinical pharmacy services provided by each hospital pharmacy, was calculated. The score (y axis) was plotted against the total number of pharmacist employed (x axis) for each site. Linear regression analysis was performed, using the method of least squares[84], to establish if a correlation existed between these two variables. Regression analysis was repeated for other staffing and workload variables.

i   Pharmacists who spend 50% or more of their time on a clinical pharmacy specialty.

j   Diploma, MSc, Masters of Philosophy or Doctorates of Philosophy.

k   According to Bohrnstedt and Knoke's rule[83]

3.2.9.3. Multivariate hypothesis testing.

Hypothesis involving several independent categorical variables (clinical pharmacy services), each of which contained binary data, were tested using Questionnaire II data and principal components, cluster and Rasch analyses.

3.2.9.3.1. Reasons for choice of multivariate analyses.

Principal components analysis would detect if groups of services were provided in association with one another. If such groups were detected, examination of the services in each group would facilitate the creation of provisional reasons why services might be provided in such groups. These reasons could engender hypotheses that could be tested later. In addition, this exercise would increase understanding of the various barriers and facilitators to service development that may exist in practice.

Cluster analysis would discover if there were any similarities between hospitals based on their provision of services to a similar extent. The existence of associations would signify that pharmacies were similar in some underlying way that was represented by their provision of a particular combination of services. Consideration of the types of hospital pharmacies in each resultant group (cluster) would help ascertain the nature of the similarity. This would enable the categorisation of hospitals into various groups based on service provision factors. Such categories could be used as a sampling frame for future exploratory work on issues related to service provision.

Rasch analysis was used to search for relationships between services based on the relative ease or difficulty experienced in their provision. Prior to data collection, the provision of some clinical pharmacy services was known to be more likely than others. Prescription monitoring was, for example, more likely to be provided by most hospital pharmacies since it is part of ward pharmacy, a service that has been provided for many years. Other services, however, are new, may require large capital, staffing and other investment or may be in lower demand, and are less likely to be provided. Examples include cytotoxic therapy teams and CIVAs. In addition, hospital pharmacies may have their ability to provide a service reduced or increased by changes in staff, staff education or other resources. Rasch analysis facilitated quantification of the barriers that existed to the provision of hospital clinical pharmacy services in the UK NHS.

3.2.9.3.2.   Principal components analysis.

Principal components analysis was used to test for the existence of, and to identify, a small number of factors that described relationships between the provision of clinical pharmacy services (interrelated variables). The data satisfied its requirements, which are for numerical data and a greater number of observations than variables[83]. H_0 stated that no relationships existed between the provision of 32 clinical pharmacy services.

A correlation matrix, using all 32 variables, demonstrated correlations between services. The standard methods for inspection of data prior to this form of analysis were used (Bartlett's test of sphericity[85], Kaiser-Meyer-Olkin test[86], anti-image covariance matrix). These confirmed that the data met all the requirements for principal components analysis.

The factor matrix was constructed. Consideration of the proportion of the total variance explained by each variable for each factor helped determine the variables that formed the factors. The number of factors that should be extracted was resolved by consideration of the size of the eigenvalues produced by the principal component analysis and from a scree plot (total variance (y axis) against factors (x axis))[83]. A ten factor model was subsequently chosen. Factor loadings were calculated using standardized multiple regression analysis with the data variables as dependent variables and the factors as independent variables. Only 41% of the loadings exceeded 0.05 indicating that this model suited the data[83]. The factor matrix was rotated using a varimax rotation[1] to increase the interpretability of factors. Variables retaining large loadings on a given factor in the rotated matrix were considered to form that factor (see Chapter IV). Calculation of factor scores for each data set case (hospital pharmacy), which could then be used to create models of service provision, is possible using principal components analysis but was not attempted because of the difficulty in assigning weightings to variables. In the analysis thus far variables had not been weighted; each service was treated identically when calculating scores. It was considered invalid to presume this was correct for further analysis since it was known that certain clinical pharmacy services are more likely to be provided than others for reasons such as staffing (numbers and education) and capital requirements.

3.2.9.3.3.   Cluster analysis.

Cluster analysis sought to discover associations between pharmacies based on their provision

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1   This minimises the number of variables that have large loadings on a factor.

of services. H_0 stated that there were no associations. Both standard methods, using dendrograms and vertical icicles, were used[87].

3.2.9.3.4. Rasch analysis.

Data on the provision of 33 clinical pharmacy services obtained in Questionnaire II was used to ascertain which services exhibited the greatest and least barriers to their provision using Rasch analysis. The concept underlying Rasch analysis[88] is that items, in this case 33 clinical pharmacy services, can be ranked in some way. The complex mathematical basis for Rasch modelling will not be discussed but the concepts will be explained.

A maximum of 33 services, with varying sizes of barriers to their provision, could be provided by a pharmacy. In the original data set a pharmacy scored 1 if it provided a service and zero if it did not. For each pharmacy, a raw score, representing the total number of services provided, could be created by summation of these individual scores. A table was constructed relating the raw service score (rows) to the provision of each service (columns). Each cell in the table contained the number of hospital pharmacies with a given raw score who provided that individual service. These data were then subjected to computerised analysis using maximum likelihood estimation to yield Rasch scores[m]. The provision of any clinical pharmacy service by a hospital pharmacy is related to the ability of the pharmacy to provide it (β), which varies between pharmacies, and the barriers to the provision of the service (δ), which is constant for any given service. This can be expressed as a probability function that provides a Rasch score for each service. Rasch scores should separate the services well. In this data set there was some clustering in the upper and lower tails of the probability distribution that was reduced by re-scoring. The raw service scores were converted into Rasch scores using the probability distribution already described. Raw scores were graphed against Rasch scores to portray the relative barriers to the provision of each of the 33 services (increasing from left to right) in UK NHS hospital pharmacies. The data were suited to Rasch analysis since there was good separation on all the services (variables) and the model was able to differentiate between the hospitals' abilities to provide services.

m   Personal Communication: Dr. C Chalmers, 1993. The computer program used for the analysis was created by A Bullock.

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3.3. Comparison of the Clinical Roles that UK NHS Hospital Pharmacists have adopted
       with those described in Official Documents.

The provision of clinical pharmacy services in UK NHS hospital pharmacies was measured in

the questionnaire surveys and compared with official recommendations on their provision

made in The Way Forward[2-4], the Nuffield Report[5], and the statement on clinical pharmacy

made by the UKCPA[7] and the RPhOs' Committee[6]. These documents were selected for

comparison because they were created in the UK having regard to the UK hospital pharmacy

situation and because they were often mentioned in the literature, or by hospital pharmacists,

as leading influences on service development. The official recommendations have been

described in Chapter 1. Notwithstanding differences in the exactness of service definitions and

recommendations in the various documents, the services recommended in them were tabulated

alongside data on actual service provision to facilitate comparison. Differences were noted and

attempts were made to explain differences by review of the literature (section 3.4), by asking

interviewees in the interview survey (section 3.5) and by making inquiries of senior hospital

pharmacists.

3.4. Evaluation of the Clinical Roles Adopted by Hospital Pharmacists.

Clinical pharmacy services were evaluated in terms of efficiency and effectiveness by

assessing relevant literature; the performance of prospective service evaluation was beyond the

scope of the project.

3.4.1. Scope of the Literature Evaluation.

Financial constraint restricted the literature review to English language publications; this was

not a significant problem since most service evaluations were from English-speaking countries.

An initial survey indicated that a large number of evaluations from UK and non-UK sources

existed. Many of these were examined. The non-UK evaluations were mainly from the USA,

Canada and Australia; Continental European studies were rarely found and were usually not in

English. It became increasingly clear that there were difficulties in extending the results of

non-UK studies to the UK NHS because of several important differences between other health

systems and the UK NHS. The health systems in the non-UK countries from which most

evaluative literature emanates are insurance based[89]. This produces differences in the economic

drivers for service provision by permitting greater freedom in the amounts spent on health

care and the prices charged by the providers of that care. The NHS is funded by taxation and,

despite a recent increase since the reforms, spending on health care in the UK is lower and more tightly controlled than elsewhere[90]. Although NHS trusts are beginning to exercise their right to introduce local pay-bargaining for health care workers and professionals, the effects are unlikely to create labour markets comparable to those in the USA. Costs are used in UK service evaluations whereas price, an often unknown multiple of cost that reflects the willingness of the purchaser to pay, the extent of recovery of charges, and the transactional costs involved in their collection, is used in other countries. Differences in training of health professionals between the UK and elsewhere has an unknown effect on the types of services provided. Earlier specialisation of US doctors, in particular, changes the breadth and depth of their expertise and hence their requirements for pharmacy support services compared to those of their UK colleagues. Similar differences are likely to be important for other staff who interact with pharmacists, such as nurses. In addition, there are differences in pharmacists' training in the UK and elsewhere[91]. These differences made it difficult to apply the results of non-UK pharmacy service evaluations to the UK NHS. It was therefore decided to focus on studies that were carried out in the NHS.

3.4.2. Location of Studies.

Studies were located using several methods:

(i)   A CD-ROM search of Medline (Index Medicus) from 1966-1982 (Compact Cambridge, Cambridge Scientific Abstracts) and 1983-June 1994 (Silverplatter) using the search terms listed below either singly or in combination -

Pharmacy or Pharmacist*	Cost* or Econom*	Role*
Hospital* or Clinical*	Quality or "health care"	Intervention*
Professional*		

(ii)   An on-line search of Embase (Excerpta Medica) from 1983-June 1994 (Elsevier Science Publishers B.V., Amsterdam) using the search terms listed under (i)

(iii)   An on-line search of Pharmline 1978-June 1994 (Datastar, Radio Suisse Ltd., Berne) using the search terms:

Pharmacist/Clinical-Pharmacist/Hospital-Pharmacist/Ward-Pharmacist/Clinical-Pharmacy/Pharmacy-Services-Hospital and one of

(a)   Economics.de/Budget.de/Cost-Control/Clinical-Budgeting

(b)   Intervention.de/Clinical-Competence.de/Professional-Competence/

(c)   Quality.de/Health-Care/Role

(iv)   An on-line search of IPAB International Pharmaceutical Abstracts 1970-June 1994

(American Society of Hospital Pharmacists) on areas where literature was lacking using the search terms listed in (i)

(v)   A manual search of journals which are not abstracted but contain references to clinical pharmacy development in the UK.

(vi)   Personal communications with various researchers who were carrying out evaluative work in clinical pharmacy (identified by contacts or from abstracts of conferences), with those involved in the production of The Way Forward[24] and the Nuffield Report[5] and with European colleagues.

(vii)   Follow-up of references in material identified by methods (i)-(vi).

Computerised search terms were broad since more specific ones resulted in loss of data.

3.4.3. Categorisation of Studies.

Many articles and reports of variable quality were located. Each was categorised, initially according to whether it was descriptive or evaluative in design and subsequently, into the categories of clinical pharmacy service listed in Table 3.2. Some studies fell into more than one category and were placed initially in a category labelled "mixed" services.

3.4.4. Criteria for Consideration of Studies.

Studies were included for assessment if they were evaluative and examined outcomes of clinical pharmacy services provided by, or in association with, UK NHS hospital pharmacies. In the complete absence of evaluative studies on a particular service, descriptive data were examined. Services can be assessed on the basis of structure, process and outcome but the aim of this review required outcome assessment; in the absence of outcome data process data were used where process variables were convincingly linked to outcome.

3.4.5. Assessment of Studies.

Studies were assessed according to criteria adapted from those for clinical pharmacy program evaluation[92,93] and economic assessments[94] (Table 3.3). Attempts were made to assess the methods section of each evaluation with the assessor ignorant of the identity of the authors and their institution, and the results. Poor presentation of many reports, however, often necessitated examination of the entire paper to determine the methods.

The study designs encountered, listed in ascending order of strength, were norm-based, before after, time series, intact group and control group[92]. Norm-based studies are the weakest

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Table 3.2. Categories of Evaluative Studies on Clinical Pharmacy Services

No.	Category Name	Examples of Services
1	Medication monitoring	Ward pharmacy
2	Creation of hospital drug use policy	Drug & Therapeutics Committee activities, Formulary systems, Drug use review, Prescribing protocols
3	Information	Drug information services
4	Advice on therapeutics	Ward pharmacy, ward rounds, therapy reviews, advice on infection control, pain and wound care
5	Team membership	Participation in nutrition, cytotoxic therapy, pain control and other multidisciplinary team services
6	Education	Of pharmacy and non-pharmacy staff
7	Research	Clinical trials, practice and other research
8	Patient specific services	Patient counselling, self-medication schemes, education, medication history-taking service
9	Quality improvement	Audit, quality and adverse drug reaction monitoring
10	Pharmacy specialist services	Therapeutic drug monitoring, central intravenous additives, anticoagulation control services
11	Services to primary care	Advisory, information and educational services provided to health professionals, workers and institutions, carers and patients
12	Mixed	Services that could be placed in several categories

Table 3.3. Assessment and ranking criteria for assessment of clinical service evaluations.

No.	Criterion description		Ranking
	All studies:		
1	Clear definition of the program or service		Yes/No
2	Well defined questions posed in answerable form		Yes/No
3	Questions posed regarding outcomes of the service or, if not, process convincingly linked to outcome		Yes/No
4	A comprehensive description of the competing alternatives		Yes/Partially/No
5	Variables:	defined	Yes/No
		appropriate	Yes/No
		valid (sensitive, specific)	Both/One/Neither
		reliable	Yes/No
6	Design of the study:	appropriate	Yes/No
		controlled for confounding	Yes/Partially/No
		control for bias	Yes/Partially/No
7	Data collection:	complete	Yes/No
		accurate	Yes/No
		reliable	Yes/No
8	Data analysis appropriate		Yes/Partially/No
9	Conclusions:	justified	Yes/Partially/No
		related to questions posed	Yes/No
		included all issues of concern	Yes/No
	In addition, for economic studies:		
10	All important and relevant costs and consequences:		
		identified	Yes/No
		measured accurately	Yes/No
		measured in appropriate units	Yes/No
11	Credible valuation of the costs and consequences		Yes/No
12	Valuation of the costs and consequences adjusted for differential timing		Yes/No/Not Applicable
13	Incremental analysis of costs and consequences performed		Yes/No
14	Sensitivity analysis performed		Yes/No

designs. Data on indicator variables of the test service are compared with nationally, regionally or locally-held data on the same variables. The use of external controls helps overcome the lack of internal ones but the design has several disadvantages including potential non-comparability of control and test data. Before-after designs are slightly stronger since they measure variables before and after changes are made. The disadvantages of using a single group may be reduced by randomisation of subjects. Many potential problems remain, including non-comparability of data due to time or patient-related factors, the Hawthorne effect[95] and the establishment of causality. The use of variants of the before-after design, such as retrospective/prospective, retrospective alone or covert designs, help reduce these problems but comparability of data is almost impossible to achieve in this type of study. Time-series designs are stronger since multiple measurements are made in the "before" and "after" phases thereby increasing the reliability of the observed differences and permitting detection of time-related effects. Intact group is a quasi-experimental design intermediate in strength between a randomised trial and an uncontrolled study. Although it uses a concurrent control group, which reduces problems of time-related non-comparability, the control group is created independently of the study and researcher bias and statistical regression towards the mean may occur. Non-comparability of test and control groups may be avoided by random sampling or assignment. Random sampling is often impractical although its absence reduces the generalisability of results. Random assignment of subjects, or of pre-formed groups of subjects if the former is impossible, ensures comparability between test and control groups and helps assure the validity of observed differences. Other measures to achieve this are stratification (for non-homogenous groups) and matching of subjects followed by random assignment of members of the matched pair. Contamination between groups remains a problem that randomisation may not solve. Generalisability of results, of randomised and of control group studies, depends on the representativeness of the sample, its treatment and its behaviour. Control group studies, commonly known as randomised controlled trials, have the strongest design since they permit the establishment of causality. With large samples, it is almost invulnerable to all forms of non-comparability.

The criteria in Table 3.3. were applied. Studies were valid if criteria 1-3, 5-8 and 10-12 inclusive (where applicable) were fully satisfied and criterion 4 was at least partially satisfied. Where studies failed to satisfy criterion 9, the assessor constructed more appropriate conclusions. Studies failing to satisfy criteria 13 and 14 were included but the absence of such information was taken into account in the conclusions made.

3.4.6. Combination of Data from Studies.

The variety and poor methods of many of the studies examined precluded the use of statistical methods for combining results. Hence study results were discussed and a general statement was made on the value of services based on the strength of the available evidence. The results of studies with stronger designs were given greater weight in drawing such conclusions. Variability in study results due to study design, chance and differences in service, subjects or outcome variables, were addressed where necessary.

3.5. Interview Survey.

The provision of clinical services by UK NHS hospital pharmacies had been quantified, some reasons for variations in services provision had been discovered and several other reasons were hypothesised, and an evaluation of UK literature on clinical pharmacy service effectiveness had been carried out. Outstanding research objectives were the exploration of the reasons for variations in service provision, differences between actual service provision and the recommendations made in various government[2-4] and other documents[5-7]. Additional objectives were to discover the value placed on clinical pharmacy services by pharmacists and their hospital customers, these groups' views on future clinical pharmacy service development and the influences on such developments.

3.5.1. Rationale for Choice of Method

The nature of the objectives suggested that an interview method should be used. This would provide data complementary to those obtained in the questionnaire survey and literature evaluation. Several interview methods were considered but the most suitable was thought to be a personal focused interview. Telephone interviews were rejected. Although cheaper, easier and less time-consuming, the method gives poorer return rates, lower accuracy and completeness of information, especially for sensitive subjects, and is considered to be less valid and reliable than personal interviews[96]. An exploratory, rather than a highly standardised, interview was required to permit the interviewer to explore the issues listed above[79,97]. Since the interviewer could reasonably expect to interview each interviewee only once, the focused interview, rather than the depth interview, method was selected. It has a high expected response rate and provides information that has greater validity and reliability since interviewers can clarify issues with respondents and spot falsifications. Replies are more spontaneous. Interviewers can control for outside influences, such as other staff-members'

opinions, by careful questioning of respondents alone. The longer duration of interviews assists in focusing respondents on topics and hence improves contributions. Areas of sensitivity may be detected and explored carefully. The interviewer remains free to pursue several paths of inquiry and can take opportunities to obtain additional relevant information[96]. The informal style of these interviews requires greater interviewer skill, intelligence, understanding and tact, and a deeper knowledge of the topic[79]. As a former hospital clinical pharmacist, the interviewer was more suited than most to perform these interviews.

3.5.2. Design of the Interview Schedule.

The objectives of this part of the research largely determined the interview topics. Interviewee's views were sought on the value of currently-provided and potential clinical pharmacy services, the reasons for current service developments, and possible barriers and facilitators to currently-provided and future services. Various other matters were raised where pertinent, such as issues about professionalisation, and interprofessional relations. These issues were formed into an interview schedule. Since interviewee's responses may be inadequate, because they are incomplete, irrelevant, inaccurate or not verbalized[98], various clarifying and exploratory probes were included in these schedules (Appendix VII). These were constructed beforehand to reduce the potential for bias in the interview. A few pilot interviews were also conducted to try to avoid eliciting inadequate responses. Of the many issues for consideration in creating interview schedules the most relevant one for this study was the need to ensure that respondents understood the terms and questions[79,96,97,99]. Terms that might be misunderstood, such as clinical pharmacy, jargon and abbreviations were avoided. Questions were rephrased if there was a possibility that interviewees had misunderstood them[79].

A few informal interviews were also conducted with health workers at each site. This permitted the interviewer to probe issues by guiding what appears to be a conversation. It allowed exploration of important site-specific issues, some of which were not identified initially by the interviewer. Informal conversational interviews facilitate openness and may provide opportunities to gain insights not obtainable in formal interviews. The pertinent danger in using such interviews in this study was the possibility of respondent deceit[100]. This technique provided limited, but revealing, data.

3.5.3. Selection of Sites and Respondents.

The nature of the interviews required the interviewer to spend three days at each interview site

(hospital). This requirement, plus time and resource constraints, limited the number of sites to eight. Selection of a representative sample of all UK NHS hospitals was desirable but the use of random or stratified sampling was impractical given the limited size of the sample. In addition, cluster analysis had failed to provided specific criteria for stratification that were proven relevant to the provision of clinical pharmacy services. Instead, judgemental sampling[96] was used to select a theoretically representative sample based on prior knowledge of factors that were thought to be important in the development of hospital clinical pharmacy. This knowledge was obtained from the results of the questionnaire survey (Chapter IV) and the preliminary research (Chapter II), numerous informal contacts and from information gleaned from UK literature. As a result, hospitals were categorised and selected using the criteria:

(i)   Teaching status

(ii)   Size

(iii)   Part of UK

(iv)   Reputation in clinical pharmacy - leaders/unusual/typical

(v)   Total number of clinical pharmacy services provided (Chapter IV).

The use of these criteria introduced a degree of stratification into the sample whilst also introducing the risks of sampling error and bias. Although it cannot be claimed that the method resulted in a completely representative sample, it was felt to be appropriate given the nature of the data being collected, the analysis method and the types of conclusions that would be drawn; it was not intended to apply statistical tests to these data[96]. Additional factors were considered in site selection. Sites were chosen that provided a broad perspective of clinical pharmacy practice[97] and allowed the interviewer easy access to all areas and persons of interest there. A contact person, usually the chief pharmacist or clinical pharmacy services manager, was selected at each site who would help in choosing interviewees and organising the visit and who could be contacted at a later date to verify data and provide expert guidance on site-specific issues[101].

Interviewees were selected in advance from specific groups that would inform the study[97]:

(i)   those in receipt of, or purchasing, clinical pharmacy services (doctors, nurses, clinical directors and managers)

(ii)   those managing clinical pharmacy services, directly or indirectly (hospital and pharmacy managers)

(iii)   those providing clinical pharmacy services (pharmacists and pharmacy technicians)

(iv)   those involved in strategic planning of clinical pharmacy development (DPhOs and

their equivalents, and chief pharmacists).

All interviewees were selected in consultation with the contact person at the site. The consultation process included discussion of potential interviewees' responsibilities and duration of service at the hospital. Interviewees were chosen who held varying levels of responsibility. All had worked at the hospital for at least a year; most had been at the site for several years. For non-pharmacy staff, their anticipated knowledge of the services offered by the pharmacy and the cordiality of their relationship with pharmacy personnel were considered. Interviewees included those who were heavy and light users of pharmacy services. By sensitively questioning the contact person it was possible to include those who were friendly and less friendly towards the pharmacy department. Where a clinical pharmacology department existed at a site, one of their staff was interviewed also since they are potential rivals of clinical pharmacists. The chief pharmacist and the pharmacist responsible for clinical pharmacy services were interviewed always. Suggestions on members of the pharmacy staff that should be interviewed were obtained from the contact person and staff lists were provided but the interviewer chose freely from these lists at all sites. This ensured that a wide variety of pharmacy staff were interviewed, including junior and senior pharmacists, newer and longer-serving members of staff, clinical, non-clinical, specialist and non-specialist pharmacists, technicians and support staff[96,97]. Interviews with non-pharmacists and senior pharmacists were usually pre-arranged whereas those with other pharmacy staff were organised during the visit for logistical reasons and because it allowed the interviewer to select carefully those that would best inform the study.

Data were collected informally also from members of these groups if situations arose that could potentially inform the research. Theoretical sampling[101] was used once data collection and analysis was under-way to guide further interviewing of pharmacy staff; it was impossible to select sites or non-pharmacy interviewees using this method due to organisational constraints in arranging interviews.

3.5.4. Arranging and Conducting the Interviews.

The chief pharmacist at each site was telephoned and their agreement to the visit was obtained. This was confirmed in a letter which explained the purpose of the study, named the sponsors, guaranteed confidentiality and anonymity and requested help in selection of interviewees (Appendix VIII). Where the contact person was somebody other than the chief pharmacist they were also telephoned and sent a similar letter. Non-pharmacist and senior

pharmacist interviews were pre-arranged by the contact person at the site and/or by the interviewer as circumstances dictated. Contact pharmacists were sent a generic letter of introduction which they could give to interviewees. This explained the purpose of the visit, the sponsorship and the contribution that interviewees would make to hospital pharmacy and the study, and guaranteed confidentiality (Appendix VIII). Where the arrangements were made by the interviewer, interviewees were first telephoned and the arrangements confirmed by letter. This included the letter of introduction or the information provided therein as appropriate (Appendix VIII). Some interviews, mainly with pharmacy staff, were arranged by the interviewer by personal contact with the interviewee following introduction by the contact pharmacist.

To ensure interviewees understood what was being required of them, they were told the reasons for the interview in the letter sent to them prior to the interview (Appendix VIII) and the information was repeated at the beginning of the interview. Since there is some evidence that interviewee interest in, and conviction of the value of, surveys affects the response rate an effort was made to increase interviewee motivation[79]. The initial letters were used to emphasise the distinction of their hospital being one of only eight sites selected in the UK and to highlight the value of their contribution to the research.

Although the length of interview is not thought to affect refusal rates it is considered best to limit it to a maximum of 45 minutes due to interviewee fatigue[96]. Interviewees were asked to set aside 30-45 minutes for the interview. Interviews were carried out usually at the interviewees place of work (office, ward, department) in a quiet place where the process was unlikely to be interrupted or overheard. Formal group interviews were carried out in similar conditions with groups of 3-6 interviewees. Informal group and individual conversational interview opportunities were taken also.

Interviews may be affected by factors such as interviewer dress, appearance and behaviour[79]. Based on the interviewer's personal knowledge of hospital pharmacy, an acceptable mode of dress and behaviour was adopted. The interviewer should be honest, interested, accurate, adaptable, pleasant, business-like, educated, and intelligent and must avoid expressing opinions on interviewee's remarks[79]. All interviews were conducted by a single researcher thereby eliminating the potential effects of interviewer differences on results[79]. Interviewees were encouraged to continue or guided, where necessary, during all interviews to ensure that

conversations remained within the broad area of research interest. They were invited to speak freely but were interrupted gracefully for reasons such as to confirm that the interviewer was following the conversation and thereby to encourage continuation, to indicate that more information was needed on the last issue raised (by use of a reflective comment or a probing remark), to elicit additional information on ideas preceding the interviewees last remark or on issues that were raised earlier in the interview (by use of a direct probe), or to raise a new topic (by use of a question)[99]. Care was taken in the use of probes to avoid causing response error[79].

Since the interviewer was not well-known to most interviewees, rapport was sought at an early stage. It was anticipated that only a single interview would be possible with each interviewee hence the maximum number of evaluative responses were sought. Towards the beginning of the interview, a number of open-ended questions were used for this purpose and to gauge the interviewee's views in general before probing more deeply in areas of particular interest. Where possible, evaluative questions were used but a higher number of descriptive questions were used where the interviewee raised issues about which the researcher knew little. It was then attempted to obtain evaluative responses via subsequent questions. Where responses were incompletely understood, particularly when "we" or "they" were not identified, clarification was sought as soon as practicable. Potentially sensitive issues were tackled at a late stage in the interview to avoid disconcerting the interviewee. For these issues, descriptive questions were used unless the interviewer was sure that evaluative ones would not cause upset or false responses[97,99]. Opinions were requested thereby reducing the potential for respondent error due to lack of knowledge and memory problems. The potential for respondents to lie, especially on sensitive issues, and to overstate answers was considered. Where a problem was suspected, the issue was raised again later in the interview or after the interviewer had indicated that the interview was over and the interviewee could speak in confidence[79]. Such comments were always recorded in as much detail as possible immediately afterwards.

The advantage of complete records provided by tape-recording interviews was balanced against their cost and the formality that it imposes on the interview. In this case the formality was considered to have a potentially greater adverse influence on data collection than the risk of data loss. This was because several topics were potentially sensitive and the presence of a tape recorder might inhibit honesty. In addition, there was a possibility that insufficient rapport would have been created between interviewee and interviewer in a short (30 minute)

interview to permit exploration of sensitive issues and tape recording would worsen matters. Concealed tape-recording was considered unethical and hazardous because of the loss of trust if it was discovered[79]. Although it is claimed that note-taking during the interview retains some formality, may impair the researcher's concentration on the interview and will probably reduce the quality of data collected (due to incompleteness and inaccuracy because of memory lapses or condensation of data into topics), it was considered to be preferable to tape-recording. Verbatim notes were taken as far as possible during the interview. These were written up immediately afterwards to ensure completeness, clarity of abbreviations and legibility. The interviewer's thoughts were also recorded then. Thoughts on the day's interviews were written that evening and a full report was written at the end of each visit[99]. These observational notes, and notes on comments made by interviewees after the formal interview had been completed, assisted in assessing the validity of interviewee's answers[79]. Informal conversational interview responses were listened to carefully and recorded as completely as possible immediately afterwards but without the interviewee's knowledge[100].

3.5.5. Data Accuracy.

Several factors may influence data accuracy. When respondents provide evaluative data, (representing their feelings and views on a topic) their emotional state at the time of interview, and their values, attitudes and opinions may influence the data. These factors cannot be controlled for but were noted where it was thought that they might have influenced the data. Other factors considered important are ulterior motives of the interviewee, their desire to please the interviewer and idiosyncratic factors that cause interviewees to express only some of their real views on issues[79]. To reduce these influences, interviews were conducted privately, the interviewer's lack of influence in the hospital was mentioned, and assurances of complete confidentiality were given. When asked, the interviewer admitted to a qualification in pharmacy but emphasised that the previous two years had been spent in a health services research unit. Where insincerity of response was suspected, the same issue was raised in a variety of ways at different times during the interview to check the consistency of the response[100]. In addition, clarification was sought from other interviewees by specific or indirect questioning[79]. Descriptive data may be distorted by faulty recollection, selective perception of situations and conscious modification of facts. Second-hand and implausible accounts were treated with caution and cross-checked, where possible, with accounts provided by other interviewees[100]. All interview data were compared whilst still at the interview site to search for any apparent contradictions or inconsistencies. Where these were detected,

clarification was sought tactfully from the interviewees or from other interviewees without breaking confidence. Unresolved conflicts in data were noted. Interviewee reliability was considered (mainly through informal non-specific inquiries in conversations with others). Such measures helped provide more accurate data[100].

3.5.6. Data Handling and Analysis.

Data were analyzed using the constant comparative method[102] in combination with analytic induction[103,104]. Constant comparison, originally developed by Glaser and Strauss[105], was used to generate categories, properties and hypotheses from the interview data from the first five sites. Data collection, coding and analysis were carried out concurrently. The data were broken down into numerous concepts and categories using open coding. The properties of the different categories and their dimensions were then extracted. Axial coding was used to discover the relationships between different categories under different conditions. This allowed linking of categories and the beginning of theory construction. Data were analyzed until such categories were sensitizing, that is they were faithful to the data, and theoretically adequate. Finalisation of the theories was undertaken using selective coding. In this process core categories were selected and related to other categories and the theories were fully formed. Theories on hospital pharmacists' clinical roles were thereby induced from interview data. These were subsequently tested (deduced) on interview data from the remaining three sites using analytic induction[103,104]. Thus the induction-deduction cycle, a strongly scientific model, was completed.

3.6. Combining Questionnaire, Interview and Literature Data.

Primary data generated from the questionnaire and interview surveys was now combined with literature evidence on service effectiveness to facilitate creation of models of the present and future clinical role of the UK hospital pharmacist. Several options, such as consensus methods and triangulation, were available but triangulation was eventually chosen.

3.6.1. Reasons for Selection of Triangulation.

The alternatives to triangulation that were considered were various consensus methods, namely the nominal group technique and the consensus development conference, and soft systems analysis. A review of the consensus methods indicated that they were unsuitable. The nominal group technique is more suited to studies where rating scales, constructed using sound

literature evidence and expert opinion, can be used[106], such as appropriateness of various conditions to various treatments[107] or appropriateness of various tasks for professionals[108]. A consensus development conference would facilitate the production of a statement representing current knowledge on the clinical role of the hospital pharmacist. It combines the judicial process, where evidence is heard by a knowledgeable but impartial panel, the scientific meeting, where experts discuss their work with peers, and the town meeting, where a forum is provided for all interested people to express their views, in making the decision[109]. It is not without its flaws, particularly the dependence of the process on the creation of unnatural data (due to the absence of sufficient primary natural data) in an artificial situation (a conference) using a group process (panel) which is susceptible to group dynamics. Additional major problems were cost, potential lack of interest from the pharmacy profession and its leading organisations, time constraints, the lack of explicit criteria for the choice of topic, questions, panellists and speakers, for decision making and for the treatment of scientific and other evidence[110-114]. Furthermore there has never been a consensus development conference on the role of a profession thus precluding the adoption of any guidelines on topics for inclusion, conduct of the decision-making process and other aspects of the process. Soft systems analysis[115] was considered also. This uses systems thinking to tackle organisational issues in the real world. It facilitates description of a real-life system where the players (groups and individuals) and their interactions are enumerated and characterized. It has been used in several situations and organisations but it seemed more suited to organisational management and action research in a single site to solve a problem than to defining a professional role in a large multi-faceted organisation with several dissimilar sites. Although this method could have been used to consider role issues at a single site, where the numerous groups that interact with pharmacy and the nature of these interactions could be considered as a system, it was difficult to apply the method to the NHS, where pharmacies, other groups and their interactions varied widely from hospital to hospital. Triangulation was chosen since it permitted combination of different types of data in an inexpensive process that was less suspect methodologically and more suited to the study data.

3.6.2. Triangulation Methods.

There are several approaches to triangulation[116]. One of the multiple method approaches, which combines (triangulates) data between methods, was used in this study. It combines data gathered from the same subjects (here the same population) using different methods.

The main problems in triangulation are doubts regarding complementarity of data and the extent to which data collection methods integrate. This is subject to ongoing debate with two basic viewpoints; some believe that the triangulation or integration of methods, and hence the integration of data collected by those methods, is a valid approach whilst others think that data gathered using different methods is complementary and cannot be combined into a rounded unity. The issue is further complicated by the belief, amongst those who use statistical methods, that data generated by more than one method is more valid than data collected using a single method. Some qualitative researchers express concerns about the ways in which the data sets are created and how the data relate to the initial theories and the original formulation of the research questions[116]. Despite these theoretical debates, triangulation suited the needs of this research.

There are several ways in which quantitative and qualitative data may be combined. The method chosen is shaped by the relative importance of each approach in the context of the overall project, the extent to which the methods are employed consecutively or simultaneously, the stages in the research at which the different methods are evident and cease to be used, and the skills of the researcher. In this study the quantitative and the quantitative research were given equal weighting to the qualitative work. Where equal weight is given to both techniques the combined methods can produce separate but related studies, as was the case here, or a single integrated study with the linking occurring either during the fieldwork or at a later stage. In this study the questionnaire data provided background information that facilitated the conduct of a smaller scale intensive interview (qualitative) survey. The questionnaire data provided a context for the interview data and a basis for interview survey sampling. The qualitative work helped clarify puzzling issues raised in the quantitative work and explored issues unsuited to research using quantitative methods[117].

3.6.3. Creation of A Model of the Clinical Role of the Hospital Pharmacist in the UK.

Following triangulation of data it was possible to specify a theoretical model[96] of hospital clinical pharmacy services that incorporated the evidence gathered during the entire study. The model expressed the components of the clinical role of the UK hospital pharmacist but did not specify all the services that could be included. This was in recognition of the differences in circumstances and customer need in various types of hospitals. The model and interview data generated recommendations for actions that may be considered by pharmacists in order to achieve change and improve practice.

3.7. Summary of Methods.

The methods used in this project were:

(i)   postal questionnaire surveys

(ii)   an evaluation of the literature on clinical pharmacy

(iii)   an interview survey analyzed using the constant comparison method

(iv)   combination of interview, questionnaire and literature data using triangulation.

The choice of methods was informed by preliminary research (Chapter II). Two questionnaire surveys provided valuable census data on UK NHS hospital pharmacy services. These were used to describe service provision, test a number of hypotheses, create several more and inform the literature analysis. The literature analysis was started prior to the interview survey and completed after it had finished. Information from the literature analysis, plus hypotheses developed from the questionnaire data, helped in the selection of interview topics. Thus the methods produced useful results in their own right but also facilitated the other methods. Finally, data from all three methods were combined and models of the future clinical role of the hospital pharmacist in the UK NHS were created.

CHAPTER IV

QUESTIONNAIRE SURVEYS: RESULTS & DISCUSSION

4.1. <u>Questionnaire I - Hospital Clinical Pharmacy Services provided by Districts to the</u>
<u>Primary Care Sector in 1992</u>

4.1.1. Response Rate.

The response rate was 91.5% (193/211). It ranged from 71.4% (5/7) in Special Health
Authorities (SHAs) to 93.2% (165/177) in England (Appendix IX, Table 1). With 100%
coverage and a very high response rate the data constituted a census, rather than a sample,
and tests of statistical significance were unnecessary.

4.1.2. Provision of Services.

The responses were analyzed in terms of the groups to whom the services were provided, the
nature of the services provided and the variation between the UK and each of its parts[n].
Districts (and their equivalents in each part of the UK) were more likely to have provided
information, advice and education to nurses working in primary care than to general
practitioners (GPs), community pharmacists, other primary care professionals[o] and
institutions[p], or patients. Drug information was the commonest service provided (Table 4.1).
Service provision varied in different parts of the UK. In general, services were provided more
often in Scotland (Appendix IX, Tables 2-6) The small numbers in non-English districts
makes interpretation of the results difficult.

Districts often provided drug information and advice on prescribing and prescribing policies to
GPs but rarely provided educational services (Table 4.1). SHAs provided no services to GPs
and no Northern Irish areas provided educational services for them. Advice on financial
aspects of drug use was provided by no Welsh board but all provided drug information from
drug information centres (DICs) (Appendix IX, Table 2). Levels of service provision were
highest for primary care nurses, especially education, drug information and advice on some
aspects of patient care (Table 4.1). SHAs and pharmacies in Northern Irish areas provided
lower, and those in Welsh boards higher, levels of services than in the UK overall (Appendix
IX, Table 3).

n   England, Scotland, Wales, Northern Ireland and Special Health Authorities.

o   Other than general practitioners, nurses working in primary care or community
     pharmacists.

p   Includes residential and nursing homes and hospices.

Table 4.1.   Provision of clinical pharmacy services by hospital pharmacies in each District[1] in the UK NHS[2] to primary care recipients[3].

Service (Number of respondents)	Numbers (%) Districts[1]
General Practitioners (n=192)	
Advice on prescribing/prescribing policies	69 (35.9)
Advice on financial aspects of drug use	37 (19.3)
Information on general drug-related matters	78 (40.6)
Drug information provided by DICs[4]	99 (51.6)
Educational services	23 (12.0)
Primary Care Nurses (n=193)	
Advice on wound care	102 (52.8)
Advice on analgesia/equipment used in PCA[5]	66 (34.2)
Information on general drug-related matters	120 (62.2)
Drug information from DICs[4]	96 (49.7)
Educational services	102 (52.8)
Patients and Persons in Primary Care (n=192)	
Individual counselling for patients with specific drug-related needs	47 (25.4)
Group education for patients	24 (12.5)
Group education for persons in the community	28 (14.6)
Other Primary Care Professionals[6] (n=192)	
Information on general drug-related matters	70 (36.5)
Drug information from DICs[4]	64 (33.3)
Educational services	33 (17.2)
Community Pharmacists (n=193)	
Advice on analgesia/equipment used in PCA[5]	7 (3.6)
Advice on parenteral nutrition/equipment used in TPN[7]	4 (2.1)
Advice on discharge of patients with specific drug needs	42 (21.8)
Drug information from DICs[4]	80 (41.5)
Educational services	30 (15.5)
Primary Care Institutions (n=193)	
Advice on wound care	58 (30.1)
Advice on sedation policies	29 (15.0)
Advice on analgesia/equipment used in PCA[5]	35 (18.1)
Information on general drug-related matters	92 (47.7)
Drug information from DICs[4]	52 (26.9)
Educational services	61 (31.6)

Notes to Table 4.1:

1. District Health Authorities (England), Health Boards (Scotland, Northern Ireland) and Health Authorities (Wales, Special Health Authorities);
2. United Kingdom National Health Service;
3. General practitioners, primary care nurses, community pharmacists, patients, persons, other health professionals and institutions in primary care;
4. Drug Information Centres;
5. Patient Controlled Analgesia;
6. Not including general practitioners, primary care nurses or community pharmacists;
7. Total Parenteral Nutrition.

Service provision to patients and persons in the community was low; patient counselling was the most frequently provided service (Table 4.1). Pharmacies in all parts of the UK provided this service to some extent whereas no SHAs, Northern Irish areas or Welsh boards provided structured group education for patients in primary care. Only in England was education provided for persons in the community (Appendix IX, Table 4).

Drug information was provided to community pharmacists from hospital DICs in many districts but other services, especially the more advanced clinical ones (advice on analgesia and parenteral nutrition or on equipment used in these areas were provided rarely. Communication between hospital pharmacists and their primary care colleagues regarding patients with specific medication needs was uncommon and community pharmacists received little education from hospital pharmacies (Table 4.1). As with GPs and primary care nurses, all Welsh boards provided drug information from DICs to community pharmacists (Appendix IX, Table 5).

Districts provided similar levels of information and educational services to primary care health professionals other than doctors, nurses and community pharmacists, as to community pharmacists (Table 4.1). Provision was higher in Welsh boards and services were not provided by SHAs (Appendix IX, Table 4). Services provided to primary care institutions were mainly information, education and advice on wound care (Table 4.1). SHAs provided no services and Northern Irish boards provided few services. Levels of service provision were higher in Welsh and Scottish boards (Appendix IX, Table 6).

4.1.3. Perceptions of Changes in Resources due to The Way Forward, The Nuffield Report and Attainment of Trust Status[q].

Pharmacy resources within districts were thought to have increased as a result of The Way Forward[2-4] by 94/192 (49%) of respondents overall but by fewer in England than in the other parts of the UK (Appendix IX, Table 7). A minority (30/185, 16.2%) thought that the Nuffield Report[5] had led to increased pharmacy resources but the majority of Welsh respondents thought that it had done so (Appendix IX, Table 7). Trust status had been attained by one or more hospitals in 57.9% (106/183) of districts but resources were thought to have

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q   The 1989 National Health Service (NHS) reforms enabled hospitals to become self-governing NHS trusts which have greater autonomy in the provision and development of services within government health policy.

changed as a result in only 22/106 (20.8%). No SHA, and fewer Scottish and Welsh than English Health Authorities, contained trust hospitals (Appendix IX, Table 7).

4.1.4. Associations between Provision of Service and Perceived Changes in Resources and Attainment of Trust Status.

It had been hypothesised that increased hospital pharmacy resources would increase the provision of clinical pharmacy services to primary care. The provision of 20 of 27 services was higher (by 10% or more, where provision was low, by a factor of two or more) in districts (and equivalents) where it was thought that resources had increased as a result of The Way Forward[2-4] (Table 4.2). Where the Nuffield Report[5] was thought to have increased resources, 21 services were provided more frequently (Table 4.3). The attainment of trust status by one or more hospitals in a district was associated with higher levels of provision of 3 services and lower levels of provision of one, namely the provision of advice to community pharmacists on discharge of patients with particular drug-related needs (Table 4.4). Perceptions of changed resources due to the move to trust status were associated with higher levels of provision of 9/27 services (Table 4.5).

4.1.5. Possible Barriers to and Facilitators of the Provision of Hospital Clinical Pharmacy Services to Primary Care.

Many respondents (133/193) volunteered additional information. In 11.4% of all districts (and equivalents) hospital pharmacy departments were increasing their activities in primary care. Sometimes the input was via Family Health Services Authority (FHSA) Pharmaceutical Advisors. These advisors were sometimes hospital pharmacists who worked with the FHSA part-time or on a sessional basis (Table 4.6). Twenty nine respondents gave examples of services provided to primary care in addition to those listed in the closed questions. These included the provision of newsletters outlining changes in hospital prescribing policy, pre-packed intravenous products to patients and educational booklets to primary care professionals and institutions, the creation of common hospital-primary care prescribing policies, assistance with the development of practice formularies, and the assessment of day-centre patients' drug therapy. Some respondents who volunteered additional information (72) also described barriers to and opportunities for increased provision of services to primary care by hospital pharmacies (Tables 4.7 & 4.8). Lack of resources, sometimes due to attainment of trust status, was the most commonly cited reason for low involvement in primary care. Other reasons were that hospital pharmacists thought that FHSA Pharmaceutical Advisors were providing many

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services already or that the responsibility for service provision rested with community pharmacists (Table 4.7). Potential facilitators for increased involvement in the provision of services to primary care were the belief that hospital pharmacists must become more involved in their provision, the potential for payment for such services, increased funding of primary care and increased hospital pharmacy resources as a result of attaining trust status.

4.1.6. Discussion.

The results suggest that the provision of clinical pharmacy services by hospital pharmacists to those in primary care is extremely variable but generally limited. There are some explanations for the observed findings. SHA pharmacies would not be expected to provide services to primary care because most do not serve local populations. The less frequent provision of the more advanced clinical pharmacy services in Northern Ireland may be because of the relative under-development of clinical pharmacy there. This could be consequent on the small numbers of pharmacists employed in each hospital pharmacy in Northern Ireland (see results of questionnaire II), the dominance of the medical profession and inherent conservatism. However, it is somewhat surprising because of the long-standing integration of primary and secondary care within the area structure in Northern Ireland, unlike the structure of separate District Health Authorities (DHAs) and FHSAs in England. The lack of service provision in the remainder of the UK was not easily explained. Although there were some encouraging results, such as the extent to which individual patient counselling was provided and the high levels of information provision, other results were disappointing. The positive effects of The Way Forward[2-4] and the Nuffield Report[5] on resources, and respondents' comments, provided potential explanations. These comments suggested that hospital pharmacies were becoming increasingly involved in the provision of services to primary care. The delay in such involvement was thought to be due to lack of resources, perceived competition from FHSA Pharmaceutical Advisors and the attitude that community, rather than hospital, pharmacists should provide such services. Data on facilitating factors implied that hospital pharmacists' awareness of the importance of, and the need for, their contribution to the provision of health care in the primary sector could stimulate their involvement. The potential for payment for such activities was identified as an incentive.

Table 4.2. Variations in the provision of clinical pharmacy services by hospital pharmacies in each District[1] in the UK National Health Service to recipients in primary care[2] associated with perceptions of increased resources due to The Way Forward[3].

Service (Number of respondents)	Number (%) of Districts[1] providing each service where The Way Forward[3] -	
	Did not increase resources	Increased resources
Advice to GPs[2] on prescribing (191)	30/97 (30.9)	39/94 (41.5)
Advice to GPs[2] on financial aspects of drug use (191)	13/97 (13.4)	24/94 (25.5)
Information to GPs[2] on general drug-related matters (191)	32/97 (33.0)	46/94 (48.9)
Advice to PCNs[2] on wound care (192)	44/98 (44.9)	58/94 (61.7)
Advice to PCNs[2] on analgesia or on PCA[4] equipment (192)	26/98 (26.5)	40/94 (42.6)
Information to PCNs[2] on general drug-related matters (192)	52/98 (53.1)	68/94 (72.3)
Information to PCNs[2] from DICs[5] (192)	44/98 (44.9)	52/94 (55.3)
Education for PCNs[2] (192)	44/98 (44.9)	58/94 (61.7)
Counselling for patients with drug-related needs (191)	13/98 (13.3)	34/93 (36.6)
Information to other PHCPs[2] on general drug-related matters (191)	30/97 (30.9)	40/94 (42.6)
Information to other PHCPs[2] from DICs[5] (191)	25/97 (25.8)	39 94 (41.5)
Advice to CPs[2] on analgesia or on PCA[4] equipment (192)	1/98 (1.0)	6/94 (6.4)
Advice to CPs[2] on parenteral nutrition/TPN[6] equipment (192)	1/98 (1.0)	3/94 (3.2)
Information to CPs[2] from DICs[5] (192)	33/98 (33.7)	47/94 (50.0)
Education for CPs[2] (192)	8/98 (8.2)	22/94 (23.4)
Advice to PCIs[2] on wound care (192)	24/98 (24.5)	34/94 (36.2)
Advice to PCIs[2] on analgesia or on PCA[4] equipment (192)	13/98 (13.3)	22/94 (23.4)
Information to PCIs[2] on general drug-related matters (192)	40/98 (40.8)	52/94 (55.3)
Information to PCIs[2] from DICs[5] (192)	20/98 (20.4)	32/94 (34.0)
Education for personnel in PCIs[2] (192)	23/98 (23.5)	38/94 (40.4)

Notes to Table 4.2:
1   Districts (England), Health Boards (Scotland & Northern Ireland) and Health Authorities (Wales & SHAs);
2.   General practitioners (GPs), primary care nurses (PCNs), community pharmacists (CPs), patients and persons in the community, primary care health professionals (PHCPs) other than doctors, nurses and community pharmacists, and primary care institutions (PCIs) including residential and nursing homes, and hospices;
3.   Department of Health. Health Services Management. The way forward for hospital pharmaceutical services. HC(88)54. London: HMSO, 1988 (and equivalents);
4.   Patient Controlled Analgesia;
5.   Drug Information Centres;
6.   Total Parenteral Nutrition.

Table 4.3. Variations in the provision of clinical pharmacy services by hospital pharmacies in each District[1] in the UK National Health Service to recipients in primary care[2] associated with perceptions of increased resources due to the Nuffield Report[3].

Service (Number of respondents)	Number (%) of Districts[1] providing each service where Nuffield[3] -	
	Did not increase resources	Increased resources
Advice to GPs[2] on prescribing (184)	53/154 (34.4)	15/30 (50.0)
Advice to GPs[2] on financial aspects of drug use (184)	28/154 (18.2)	9/30 (30.0)
Information to GPs[2] on general drug-related matters (184)	61/154 (39.6)	15/30 (50.0)
Information to GPs[2] from DICs[4] (184)	74/154 (48.1)	19/30 (63.3)
Education for GPs[2] (184)	16/154 (10.4)	7/30 (23.3)
Advice to PCNs[2] on wound care (185)	75/155 (48.4)	21/30 (70.0)
Advice to PCNs[2] on analgesia or on PCA[5] equipment (185)	48/155 (31.0)	16/30 (53.3)
Information to PCNs[2] on general drug-related matters (185)	89/155 (57.4)	24/30 (80.0)
Information to PCNs[2] from DICs[4] (185)	71/155 (45.8)	18/30 (60.0)
Education for PCNs[2] (185)	77/155 (49.7)	19/30 (63.3)
Counselling for patients with drug-related needs (184)	32/154 (20.8)	14/30 (46.7)
Group education for patients in the community (184)	15/154 (9.7)	6/30 (20.0)
Group education for persons in the community (184)	18/154 (11.7)	7/30 (23.3)
Information to other PHCPs[2] on general drug-related matters (185)	50/155 (32.2)	16/30 (53.3)
Information to other PHCPs[2] from DICs[4] (185)	43/155 (27.7)	16/30 (53.3)
Education for other PHCPs[2] (185)	22/155 (14.2)	8/30 (26.7)
Advice to CPs[2] on analgesia or on PCA[5] equipment (185)	2/155 (1.3)	4/30 (13.3)
Information to CPs[2] from DICs[4] (185)	61/155 (39.4)	15/30 (50.0)
Information to PCIs[2] on general drug-related matters (185)	69/155 (44.5)	17/30 (56.7)
Information to PCIs[2] from DICs[4] (185)	35/155 (22.6)	16/30 (53.3)
Education for personnel in PCIs[2] (185)	43/155 (27.7)	14/30 (46.7)

Notes to Table 4.3:

1. Districts (England), Health Boards (Scotland & Northern Ireland) and Health Authorities (Wales & SHAs);
2. General practitioners (GPs), primary care nurses (PCNs), community pharmacists (CPs), patients and persons in the community, primary care health professionals (PHCPs) other than doctors, nurses and community pharmacists, and primary care institutions (PCIs) including residential and nursing homes and hospices;
3. Pharmacy. The Report of a Committee of Inquiry appointed by the Nuffield Foundation (Chair: Sir K Clucas). London: The Nuffield Foundation 1986;
4. Drug Information Centres;
5. Patient Controlled Analgesia.

Table 4.4. Variations in the provision of clinical pharmacy services by hospital pharmacies in each District[1] in the United Kingdom National Health Service to recipients in primary care[2] associated with hospitals in the District[1] that had attained trust status[3].

Service (Number of respondents)	Number (%) of Districts[1] providing each service where hospitals -	
	Had not become Trusts[3]	Had become Trusts[3]
Advice to PCNs[2] on analgesia or on PCA[4] equipment (183)	21/77 (27.3)	42/106 (39.6)
Advice to CPs[2] on parenteral nutrition/TPN[5] equipment (183)	1/77 (1.3)	3/106 (2.8)
CPs[2] advised on discharge of patients with specific drug-related needs (183)	22/77 (28.6)	18/106 (17.0)
Education for personnel in PCIs[2] (183)	20/77 (26.0)	40/106 (37.7)

Notes to Table 4.4:
1. District refers to District Health Authorities (England), Health Boards (Scotland and Northern Ireland) and Health Authorities (Wales and SHAs);
2. General practitioners (GPs), primary care nurses (PCNs), community pharmacists (CPs), patients and persons in the community, primary care health professionals (PHCPs) other than doctors, nurses and community pharmacists, and primary care institutions (PCIs) including residential and nursing homes and hospices;
3. Some Districts contained hospitals that had become National Health Service trusts;
4. Patient Controlled Analgesia;
5. Total Parenteral Nutrition.

Table 4.5. Variations in the provision of clinical pharmacy services by hospital pharmacies in each District[1] in the United Kingdom National Health Service to recipients in primary care[2] associated with perceptions that attainment of trust status[3] by hospitals in the District[1] had altered resources.

Service (Number of respondents)	Number (%) of Districts[1] with trust[3] hospitals providing each service where resources -	
	Had not altered	Had altered
Information to GPs[2] on general drug-related matters (105)	30/83 (36.1)	11/22 (50.0)
Information to GPs[2] from DICs[4] (105)	44/83 (53.0)	14/22 (63.6)
Information to PCNs[2] from DICs[4] (106)	41/84 (48.8)	15/22 (68.2)
Advice to CPs[2] on analgesia/equipment used in PCA[5] (106)	3/84 (3.6)	2/22 (9.1)
CPs[2] advised on discharge of patients with specific drug-related needs (106)	12/84 (14.3)	6/22 (27.3)
Information to CPs[2] from DICs[4] (106)	35/84 (41.7)	14/22 (63.6)
Education for other PHCPs[2] (106)	13/84 (15.5)	6/22 (27.3)
Information to PHCIs[2] from DICs[4] (106)	20/84 (23.8)	11/22 (50.0)
Education for PHCI[2] staff (106)	27/84 (32.1)	13/22 (59.1)

Notes to Table 4.5:
1. District refers to District Health Authorities (England), Health Boards (Scotland and Northern Ireland) and Health Authorities (Wales and SHAs);
2. General practitioners (GPs), primary care nurses (PCNs), community pharmacists (CPs), patients and persons in the community, primary care health professionals other than doctors, nurses and community pharmacists, primary care institutions including residential and nursing homes and hospices;
3. Some Districts contained hospitals that had become National Health Service trusts;
4. Drug Information Centres;
5. Patient Controlled Analgesia.

Table 4.6.   Comments volunteered by respondents[1] that indicated increasing input by UK National Health Service hospital pharmacies in primary care.

Evidence	Number (%) respondent
Hospital pharmacy department works closely with FHSA[2] Pharmaceutical Advisors	2 (1.0)
Hospital pharmacy department is presently increasing direct input into primary care	22 (11.4)
Hospital pharmacists are providing services to primary care as FHSA[2] Pharmaceutical Advisor (often on a part-time/sessional basis)	12 (6.2)
Hospital pharmacists are developing joint general practice-hospital prescribing protocols/policies/guidelines	4 (2.1)
Hospital pharmacists are developing joint general practice-hospital formularies	1 (0.5)
Community pharmacists have been encouraged and, where necessary, helped to provide pharmaceutical care to patients, institutions and persons in primary care	5 (2.6)
Specific examples were given of the provision of clinical pharmacy services to primary care	29 (15.0)

Notes to Table 4.6:
1.   133 respondents volunteered information. Data from the 98 that indicated increasing input in primary care are presented here but the percentages are of the total of 193 respondents to the questionnaire;
2.   Family Health Service Authority.

Table 4.7.   Comments volunteered by respondents[1] that indicated present or future barriers to increasing input by UK NHS[2] hospital pharmacies in primary care.

Evidence	Number (%) respondent
FHSA[3] Pharmaceutical Advisors provide many pharmaceutical services to general practice	5 (2.6)
Lack of resources impedes hospital pharmacists' increased involvement in primary care	10 (5.2)
Hospital pharmacy services to primary care are being disrupted by the NHS[2] re-organisation	1 (0.5)
The NHS[2] reorganisation may prevent the initiation or continuation of present hospital pharmacy services	1 (0.5)
Trust status has effectively reduced funds to clinical pharmacy	5 (2.6)
Community pharmacists should provide clinical pharmacy services in primary care	4 (2.1)
Developments in primary care are dependent on funding becoming available	2 (1.0)

Notes to Table 4.7:
1.   133 respondents volunteered information. Data from the 72 that mentioned barriers to the development of pharmacy services to primary care are presented here but the percentages are of the total of 193 respondents to the questionnaire;
2.   United Kingdom National Health Service.
3.   Family Health Service Authority.

Table 4.8.   Comments volunteered by respondents[1] that indicated facilitators to increasing input by UK NHS[2] hospital pharmacies into primary care.

Evidence	Number (%) respondent
Good links with FHSA[3] Pharmaceutical Advisors promote good links between the hospital pharmaceutical service and general practice	1 (0.5)
Increased primary care funds have aided provision of hospital pharmacy advisory services to primary care	4 (2.1)
Hospital pharmacy departments work closely with FHSA[3] Pharmaceutical Advisors	2 (1.0)
Hospital pharmacy is receiving funds from primary care to provide certain clinical services (such as services to GPs[4])	4 (2.1)
GPs[4] are requesting advisory services from hospital pharmacists	2 (1.0)
GPs[4] are requesting educational services from hospital pharmacists	1 (0.5)
Joint hospital-FHSA[3] Pharmaceutical Advisors increase clinical pharmacy services to GPs[4]	1 (0.5)
Respondents acknowledged the need for hospital pharmacists to increase the provision of pharmaceutical care to primary care	14 (7.3)
Awareness of services promotes their use	2 (1.0)
Trust status has increased funds for clinical pharmacy	6 (3.1)

Notes to Table 4.8:

1.   133 respondents volunteered information. Data from the 72 that mentioned facilitators to the increased provision of services to primary care are presented here but the percentages are of the total of 193 respondents to the questionnaire;
2.   United Kingdom National Health Service;
3.   Family Health Service Authority;
4.   General Practitioners.

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4.1.7. Limitations.

Although respondents were managerially responsible for pharmacy services in their district, they may have been unaware of all the services being provided. Despite advice (in the covering letter) to delegate completion of the questionnaire to a more appropriate person if necessary, the questionnaire results may have been affected. In addition, replies to questions on the provision of more advanced clinical services, such as the provision of advice on PCA, may reflect their uptake rather than their availability. Hypotheses relating to the effects of trust status referred to net resource shifts and did not specify their direction. It was impossible to create more specific hypotheses since some health authorities contained multiple trust hospitals and resource changes in individual hospitals could be either positive or negative.

4.2. Questionnaire II - Provision of Clinical Pharmacy Services in United Kingdom National Health Service hospitals in 1992.

4.2.1. Response Rate.

Initially, 508 questionnaires were mailed. At follow-up, 45 were excluded; 30 from ineligible sites[r] and 15 from sites to which two questionnaires had been sent (DPhOs and their equivalents had named two respondents). Of the corrected initial sample (463), 416 (89.8%) were returned. The response rate varied from 60.9% (14/23) in Northern Ireland to 95.8% (23/24) in Wales. Complete coverage of eligible pharmacies and a high response rate meant that the results could be regarded as census data. Responding and non-responding pharmacies were similar in terms of location in medical school teaching hospitals (Appendix X, Table 1).

4.2.2. Reliability and Validity.

Face and content validity was assured by pre-testing. The nature of the questionnaire precluded testing for criterion-related and construct validity. Opportunities arose to test for inter-rater and parallel forms reliability. Of the 45 questionnaires that were excluded, 15 were from sites that had already responded to the survey. At each of these sites the questionnaires had been completed by different pharmacists and had been returned separately at intervals in excess of two weeks. It was assumed that the questionnaires had been completed independently and replies within sites were compared. Replies to closed questions were identical demonstrating inter-rater reliability. Data on staffing levels from this survey were comparable with contemporaneous staffing data collected independently by one English regional health authority showing parallel forms reliability. Test-test reliability could not be assessed in this single postal survey.

4.2.3. Demography, Staffing, Management, Resource Changes and Opening Hours.

Few responding pharmacies (105/389, 27%) were in teaching hospitals but a higher proportion were located in such hospitals in Scotland (19/41) and Northern Ireland (7/14) (Appendix X, Table 1). Almost a third of pharmacies (118/402, 29.4%) were in self-governing NHS trusts, mainly in England (Appendix X, Table 2).

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r Sites were included if a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. Ineligible sites did not have an on-site pharmacy, received a visiting pharmacy service or operated as a satellite, or were served by a pharmacy located at a site already included in the survey.

The median number of hospital beds served was 545 (n=409). The nterquartile range (IQR) was large (522) and the frequency distribution was highly skewed with a long upper tail (Fig 4.1). Pharmacies in SHAs and Northern Ireland served fewer beds (medians of 174 and 380 respectively) (Appendix X, Table 2).

Seven was the median number of pharmacists employed (IQR=9, n=389). The median for whole time equivalents (WTEs) was identical (IQR=8.5, n=375) suggesting that most pharmacists held full-time positions (Appendix X, Table 2). Both frequency distributions were skewed to the left (Figs 4.2 & 4.3). The frequency distribution of the number of beds served by hospital pharmacists is shown in Fig 4.4. A workload index (pharmacists/100 beds) showed that Northern Irish hospitals employed relatively fewer pharmacists (workload index=1.2), and SHAs relatively more (index=3.5), compared to the UK as a whole (index=1.5). The results for WTE-adjusted figures were similar.

Many pharmacies (185/410, 45.1%) employed specialist clinical pharmacists. Of those that did, the median number employed was two (IQR=2). Although 305/410 (74.4%) hospitals employed pharmacists with higher qualifications (Appendix X, Table 2), these were mainly diploma (184, 44.9%) or Masters of Science (MSc) (217, 52.9%) graduates; few employed those with Masters of Philosophy (MPhil) (26, 6.3%) or Doctorates of Philosophy (PhD) (60, 14.6%) (Appendix X, Table 3). Hospitals that employed pharmacists with higher qualifications employed a median of two such pharmacists (IQR=3) (Appendix X, Table 2). The employment of pharmacists with MScs by more Scottish hospitals (29/44) and with diplomas by more Welsh hospitals (14/23) probably reflects the geographical availability of such courses before 1992 (Appendix X, Table 3).

Chief pharmacists usually were managerially responsible to the hospital manager (198/408, 48.5%) (Appendix X, Table 2). Alternative managers included members of the Hospital Board (47/408, 11.5%) and Service Managers (59/408, 14.5%). Three chief pharmacists in Northern Ireland and six in Scotland were responsible to more senior pharmacists at area level. Pharmacy normally held the drug budget (245/408, 60%) although more commonly so in Northern Ireland (13/14), Scotland (32/45) and Wales (18/23) (Appendix X, Table 2); clinical directors held it in five SHAs.

Respondents thought that resources had increased for clinical pharmacy services as a
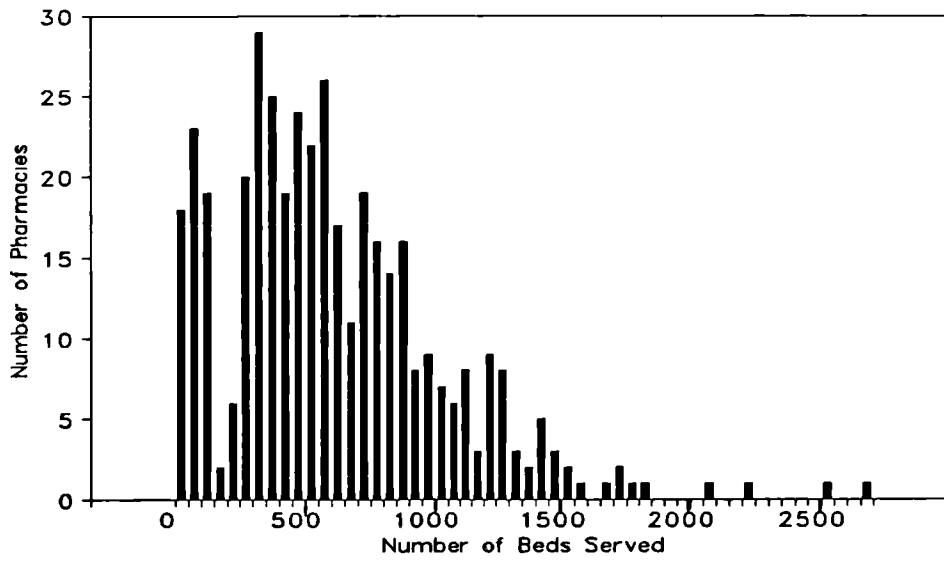
Figure 4.1.   Total Number of Beds Served by United Kingdom National Health Service
                Pharmacies (n=409).
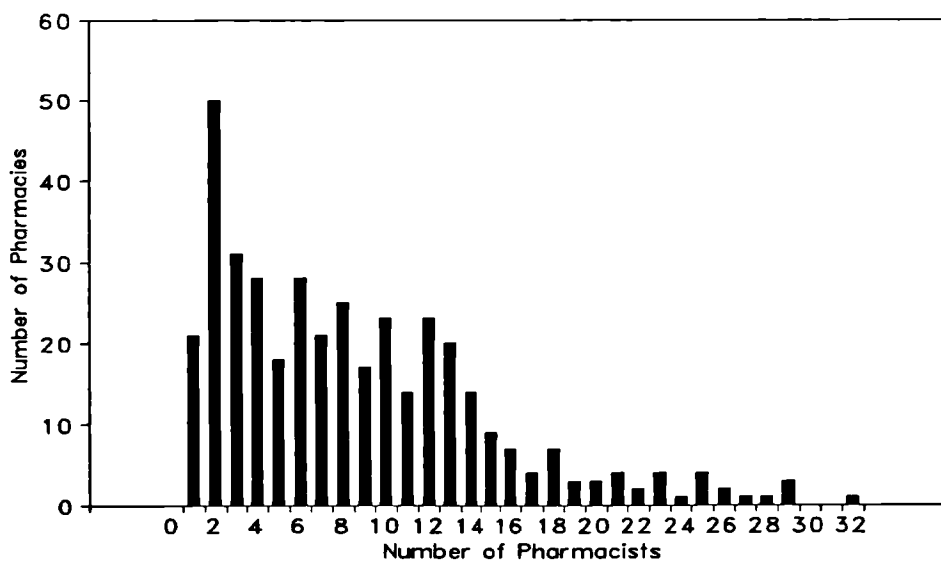
Figure 4.2.   Number of Pharmacists employed by United Kingdom National Health Service
                Hospitals (n=389).
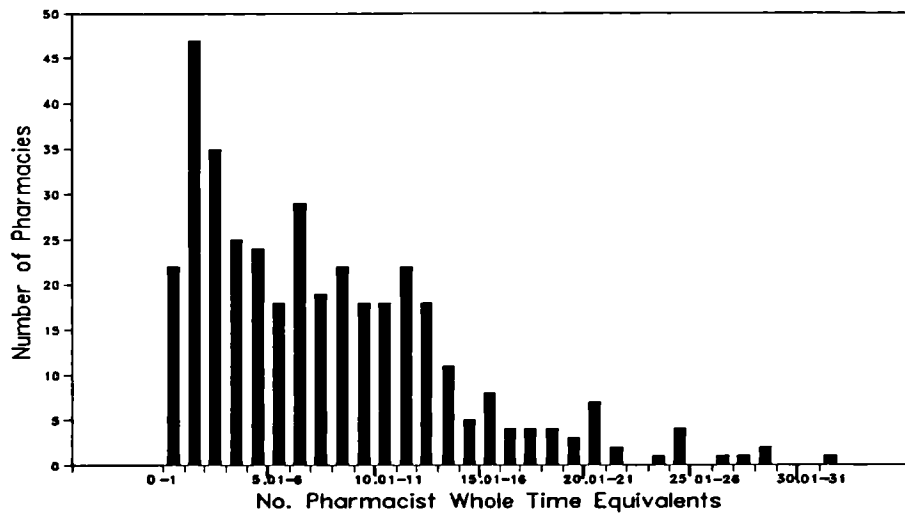
Figure 4.3.   Number of Whole Time Equivalent Pharmacists employed in United Kingdom
               National Health Service Hospitals (n=375).
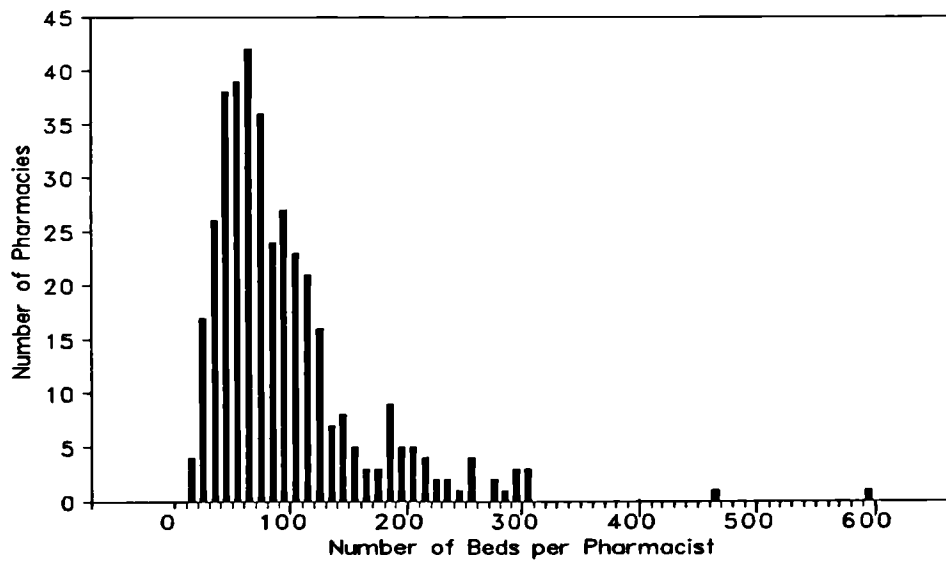
Figure 4.4.   Number of Beds Served by Hospital Pharmacists in United Kingdom National
               Health Service Hospitals (n=382).

result of The Way Forward[2-4] in 42.9% (174/406) of hospitals. Fewer Northern Irish respondents (4/14) had this perception. Some respondents (77/391, 19.7%) thought that resources had increased for clinical pharmacy services due to the Nuffield Report[5]. More though this in Scotland (12/40) and SHAs (3/8) (Appendix X, Table 2).

Pharmacies opened for a median of 8.5 hours daily (IQR=0.5) on weekdays (Fig 4.5). Most opened on Saturdays and Public Holidays (305/414, 73.7%) and remained closed on Sundays (374/414, 90.3%). Opening hours were restricted to a median of three on Saturdays, Sundays and Bank holidays (IQR=0.5, 2 and 1 respectively) (Appendix X, Table 4). When closed, pharmacy services consisted of a pharmacist on-call-from home, providing advice and being available to arrange drug supply, and, more rarely, a residency service, where a sole on-site pharmacist provided emergency pharmacy supply and advisory services (Table 4.9). Residency was commoner in teaching hospitals (Table 4.10) and where specialist clinical pharmacists were employed (Table 4.11); it was unavailable in Welsh and SHA hospitals (Appendix X, Table 4). Most pharmacies provided services to off-site units of NHS hospitals (276/409, 67.5%) and to other NHS hospitals (220/408, 53.9%). SHA's pharmacies rarely provided these services (Table 2, Appendix X).
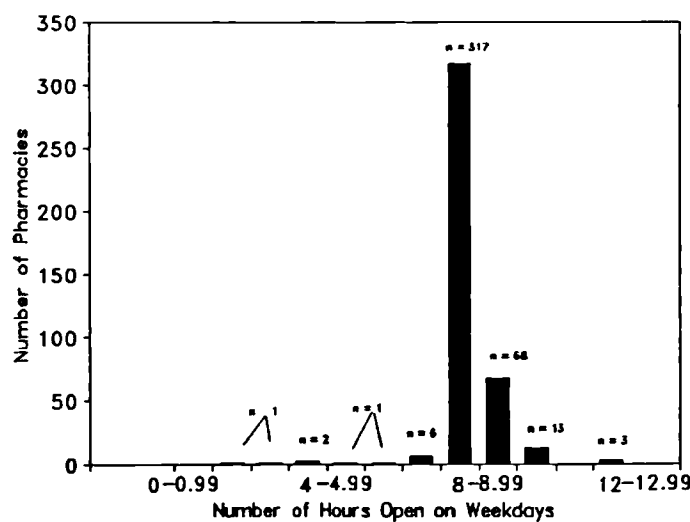
Figure 4.5. Number of Hours for which United Kingdom National Health Service Hospital Pharmacies were open on Weekdays (n=413).

4.2.4. **Provision of Clinical Pharmacy Services.**

4.2.4.1. **Drug therapy monitoring.**

Most pharmacies monitored acute and long-stay in-patient drug therapy (Table 4.9) on the ward (367 393, 93.4%) confirming that ward pharmacy was standard practice. Monitoring was provided normally for acute patients daily on weekdays (351/392, 89.5%) but rarely at weekends (51/393, 13%); for long-stay patients it was at least weekly (245/335, 73.1%) in most hospitals with these patients. Fewer Northern Irish hospitals provided monitoring for long-stay patients (10/14) or daily monitoring for acute in-patients (8/12). No Northern Irish or SHA pharmacy provided acute in-patient monitoring at weekends. Drug therapy monitoring was associated with increasing numbers of pharmacists (Table 4.12). The median number of pharmacists working on the wards in each hospital was six (IQR=7); the median was higher in Wales (8) (Appendix X, Table 5). A comparison of the median number of ward pharmacists with the median number employed (Appendix X, Table 2) indicates that most UK pharmacists worked on the wards (Appendix X, Table 5).

4.2.4.2. **Participation in ward rounds.**

Pharmacists participated in ward rounds conducted by medical staff and contributed to treatment decisions in many hospitals (Table 4.9), especially in teaching hospitals (Table 4.10), and in hospitals with more pharmacists (Table 4.12), clinical pharmacy specialists (Table 4.11) or pharmacists with higher qualifications (Table 4.13), or where resources were thought to have increased consequent on The Way Forward[2-4] (Table 4.14) and the Nuffield Report[5] (Table 4.15). In most hospitals some pharmacists attended ward rounds (288/414) but all did so in only a few (33/414). Fewer SHA (4/9) pharmacies sent pharmacists on ward rounds (Appendix X, Table 6).

4.2.4.3. **Participation in hospital policy-making groups.**

Drug and Therapeutic Committees (DTCs)[s] existed in 87.2% (361/414) of hospitals. Pharmacists normally participated in DTC meetings (Table 4.9), more so in hospitals with greater numbers of pharmacists (Table 4.12). Formularies existed in 82.4% (342/415) of

s   Drug and Therapeutic Committees usually contain medical, pharmacy and other staff. They determine hospital drug policy in consultation with pertinent staff.

Table 4.9. Provision of clinical pharmacy services in United Kingdom National Health Service hospitals[1].

Service details	Number (%) pharmacies providing services
Provision of drug therapy monitoring for acute patients	394/409 (96.3)
Provision of drug therapy monitoring for long-stay patients[2]	313/335 (93.4)
Out-of-hours service: Residency[3]	39/412 (9.5)
Pharmacist on call from home[3]	363/412 (88.1)
Participation by some pharmacists in medical ward rounds	321/414 (77.6)
Participation in Drug and Therapeutic Committee meetings	329/341 (96.5)
Application of a formulary system[4]	295/333 (88.6)
Provision of advice to clinical directorates[5]	181/279 (64.9)
Provision of financial information on drug use	360/397 (90.7)
Provision of information used in creating prescribing policies	296/397 (74.6)
Provision of information used in making formulary decisions	288/397 (72.5)
Provision of information used in new product evaluations	237/397 (59.7)
Participation in infection control services[6]	24/391 (6.1)
On-site drug information centre	245/411 (59.6)
Provision of education for pharmacy staff	281/413 (68.0)
Provision of education for nurses (and student nurses)	267/416 (64.2)
Provision of education for doctors	27/416 (6.5)
Provision of education for medical students	17/416 (4.1)
Provision of education for other hospital health professionals[7]	64/416 (15.4)
Conduct of practice research	170/412 (41.3)
Contribution to medical audit[8]	204/410 (49.8)
Performance of pharmacy audit[8]	108/404 (26.7)
Participation in clinical audit[8]	29/404 (7.2)
Provision of support for clinical trials	380/413 (92.0)
Pharmacist involvement in total parenteral nutrition teams	147/401 (36.6)
Pharmacist involvement in cytotoxic chemotherapy teams	92/399 (23.1)

Table 4.9 continued.

Service details	Number (%) pharmacies providing services
Pharmacist involvement in patient controlled analgesia teams	60/388 (15.5)
Provision of therapeutic drug monitoring	83/394 (21.1)
Provision of anticoagulation control	18/377 (4.8)
Provision of advice on wound care	66/404 (16.3)
Provision of advice on pain control	33/396 (8.3)
Provision of a central intravenous additive service	139/381 (36.5)
Patient medication history-taking	67/409 (16.4)
Self-medication schemes[9]	204/407 (50.1)
Patient medication counselling	245/406 (60.3)
Patient education	102/401 (25.4)
Operation of the CSM ADR[10] monitoring scheme	187/407 (45.9)
Operation of an additional ADR monitoring scheme[10]	46/367 (12.5)

Notes to Table 4.9:

1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;

2. Not all hospitals had long-stay patients;

3. Resident pharmacists usually provide an on-site emergency pharmacy supply and advisory service. They work alone but may be supported and advised by pharmacy staff at home;

4. 342/415 (82.4%) of hospitals had a formulary. Application of the formulary meant that fewer than 100% of requests for non-formulary products were acceded to by pharmacy;

5. Resource management units in some (279/414, 67.4%) of UK NHS hospitals;

6. Understood by respondents to include assistance with the creation of, and provision of advice on, various infection control policies;

7. Health professionals other than pharmacists, doctors and nurses;

8. Audit is a quality assurance activity. It may be led by, and predominantly involve, doctors (medical audit) or pharmacists (pharmacy audit) or it may be multidisciplinary (clinical audit);

9. Also known as self-administration schemes;

10. Committee of Safety of Medicines (CSM) adverse drug reaction (ADR) monitoring scheme and adverse drug reaction monitoring schemes in addition to the CSM scheme.

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Table 4.10. Variations in clinical pharmacy service provision in United Kingdom National Health Service Hospitals[1] depending on location in medical school teaching hospitals.

Service	Number (%) pharmacies providing each service in -	
	Non-teaching hospitals	Teaching hospitals
Provision of residency services[2] (n=387)	9/282 (3.2)	29/105 (27.6)
Participation in medical ward rounds (n=387)	210/283 (74.2)	89/104 (85.6)
Advising clinical directorates[3] (n=264)	113/189 (59.8)	55/75 (73.3)
Presence of an on-site DIC[4] (n=385)	158/281 (56.2)	78/104 (75.0)
Provision of education for pharmacists (n=387)	184/282 (65.2)	80/105 (76.2)
Provision of education for nurses (n=389)	173/284 (60.9)	78/105 (74.3)
Practice research (n=385)	91/281 (32.4)	68/104 (65.4)
Contribution to medical audit[5] (n=383)	130/279 (46.6)	60/104 (57.7)
Participation in TPN teams[6] (n=374)	83/270 (30.7)	58/104 (55.8)
Participation in cytotoxic therapy teams (n=372)	47/268 (17.5)	40/104 (38.5)
Provision of central intravenous additives (n=358)	88/258 (34.1)	48/100 (48.0)

Notes to Table 4.10:
1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;
2. Resident pharmacists usually provide an on-site emergency pharmacy supply and advisory service. They work alone but may be supported and advised by pharmacy staff at home;
3. Resource management units in some (279/414, 67.4%) UK NHS hospitals;
4. Drug Information Centre;
5. A quality assurance activity led by, and predominantly involving, doctors;
6. Total Parenteral Nutrition.

Table 4.11. Variations in clinical pharmacy service provision in United Kingdom National Health Service Hospitals[1] depending on the presence of specialist clinical pharmacists[2].

Service	Number (%) pharmacies providing each service where specialist clinical pharmacists[2] -	
	Were not present	Were present
Provision of residency services[3] (n=409)	11/225 (4.9)	28/184 (15.2)
Participation in medical ward rounds[4] (n=409)	146/224 (65.2)	171/185 (92.4)
Advising clinical directorates[4] (n=276)	76/138 (55.1)	103/138 (74.6)
Presence of an on-site DIC[5] (n=406)	121/221 (54.8)	123/185 (66.5)
Provision of education for pharmacists (n=408)	131/224 (58.5)	148/184 (80.4)
Provision of education for nurses (n=410)	125/225 (55.6)	140/185 (75.7)
Practice research (n=407)	60/222 (27.0)	110/185 (59.5)
Contribution to medical audit[6] (n=405)	90/221 (40.7)	112/184 (60.9)
Performance of pharmacy audit[6] (n=400)	41/218 (18.8)	67/182 (36.8)
Participation in TPN teams[7] (n=396)	55/215 (25.6)	91/181 (50.3)
Participation in cytotoxic therapy teams (n=394)	25/214 (11.7)	66/180 (36.7)
Provision of TDM[8] service (n=389)	28/208 (13.5)	55/181 (30.4)
Provision of medication histories (n=404)	19/221 (8.6)	48/183 (26.2)
Provision of self medication schemes[9] (n=402)	94/219 (42.9)	108/183 (59.0)
Provision of patient counselling (n=401)	113/216 (52.3)	131/185 (70.8)
Provision of patient education (n=396)	45/214 (21.0)	57/182 (31.3)
Operation of CSM ADR scheme[10] (n=402)	90/219 (41.1)	95/183 (51.9)
Operation of additional ADR scheme[10] (n=362)	10/194 (5.2)	36/168 (21.4)

Notes to Table 4.11:

1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;
2. Pharmacists who spend 50% or more of their time on a clinical pharmacy specialty;
3. Resident pharmacists usually provide on-site emergency supply and advisory service. They work alone but may be supported and advised by pharmacy staff at home;
4. Resource management units in some (279/414, 67.4%) UK NHS hospitals;
5. Drug Information Centre;
6. Audit is a quality assurance activity It may be led by, and predominantly involve, doctors (medical audit), pharmacists (pharmacy audit) or others,
7. Total Parenteral Nutrition;
8. Therapeutic Drug Monitoring;
9. Also known as self-administration schemes;
10. Committee of Safety of Medicines (CSM) adverse drug reaction (ADR) monitoring scheme and adverse drug reaction monitoring schemes in addition to the CSM scheme.

hospitals and were reported to have been implemented in most[t]. Some SHAs (3/9) had formularies but only one reported implementing it (Appendix X, Table 6). This may reflect the preponderance of highly specialised medical staff in SHAs, impeding agreement on drug policies. Formulary implementation was associated with increasing numbers of pharmacists (Table 4.12). Except for Scotland (6/39) and SHAs (1/9) (Appendix X, Table 6), few pharmacies (24/391) were involved in infection control services (Table 4.9). These services included assistance with the creation of, and provision of advice on, various infection control policies. Lack of pharmacy involvement may be due to increasing involvement of nurses in this area.

In most hospitals with clinical directorates (279/416, 67.4%), advice on drug use was provided to them by pharmacy (Table 4.9) usually via a meeting with the clinical director (117/174, 67.2%) or business manager (71/174, 40.8%). A high proportion of SHA pharmacies (6/7) provided this service (Appendix X, Table 6). Its provision was associated with being a teaching hospital (Table 4.10), having more pharmacists (Table 4.12), specialist clinical pharmacists (Table 4.11) or those with higher qualifications (Table 4.13), and with perceived increases in resources as a result of The Way Forward[2-4] (Table 4.14). Irrespective of the existence of the directorate structure, most pharmacies provided financial information on drug use and information used in the creation of prescribing policies, in making formulary decisions and in evaluating new medicinal products (Table 4.9). Fewer SHA pharmacies provided information for formulary decisions and new product evaluation (Appendix X, Table 6), probably due to the relative absence of formularies at these hospitals.

4.2.4.4. Provision of drug information and educational services.

Many hospitals had an on-site pharmacy drug information centre (DIC) (Table 4.9) and 236 (96.3%) of these contained designated pharmacists. All SHA pharmacies, but only 10/23 Welsh hospitals, had a DIC (Appendix X, Table 7). There was a single DIC in most Welsh areas. On-site DICs were associated with teaching hospitals (Table 4.10), increasing numbers of pharmacists (Table 4.12), specialist clinical pharmacists (Table 4.11) and those with higher qualifications (Table 4.13), and perceived increases in resources due to The Way Forward[2-4] (Table 4.14) and the Nuffield Report[5] (Table 4.15). In the absence of an on-site DIC,

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t   Formularies are lists of drugs that are available in the hospital. Some also contain information on other products, prescribing policies, pharmacokinetics and costs. They may serve educational and cost control purposes. In this survey, implementation of the formulary meant that fewer than 100% of non-formulary requests were approved.

information was obtained often from other DICs. Irrespective of whether a DIC was on site or not, most pharmacies provided several types of information including clinical information on drug use (312/397, 78.6%) and educational material for hospital staff (179/397, 45.1%), non-hospital health professionals (91/397, 22.9%) and patients (167/397, 42.1%). Fewer Northern Irish (3/13) and SHA (2/9) pharmacies provided educational material for hospital staff and fewer Northern Irish (1/13), Welsh (3/22) or SHA (1/9) pharmacies provided education material for non-hospital health professionals (Appendix X, Table 7).

Education was provided frequently for pharmacists (Table 4.9), often as part of a MSc (86, 30.6%) or a diploma (216, 76.9%) course. Data on these courses in 1991-2[118] indicate that most would have been in clinical pharmacy and are consistent with the observation that more hospitals in Northern Ireland (3/7) and Scotland (18/27) provided education for MSc courses and more hospitals in Wales (16/17) and SHAs (5/5) for diplomas. Pharmacies used several types of educational method including clinical skills training (173/281, 61.6), group teaching on the clinical use of drugs (152/281, 54.1%), in-house clinical pharmacy courses (157/281, 55.9%), teaching using peer review (137/281, 48.8%) and dissemination of printed educational material (116/281, 41.3%); 29 used interactive methods of teaching. More SHA pharmacies provided all the types of education asked about. Few Northern Irish pharmacies (2/7) provided clinical skills training and few Scottish pharmacies (7/27) disseminated printed educational material (Appendix X, Table 7). Provision of education was associated with teaching hospitals (Table 4.10), increasing numbers of pharmacists (Table 4.12), specialist clinical pharmacists (Table 4.11) or pharmacists with higher qualifications (Table 4.13), and perceptions that The Way Forward[2-4] (Table 4.14) or the Nuffield Report[5] (Table 4.15) had increased resources.

Many pharmacies provided education for hospital nurses; few provided it for doctors, medical students or other non-pharmacy health care professionals and workers (Table 4.9). Few Northern Irish (4/14), and more SHA (8/9), pharmacies provided nurse education. Few Scottish (3/45), and more Welsh (6/23) and SHA (2/9), pharmacies provided education for other health professionals and workers (other than doctors, nurses and pharmacy staff) (Appendix X, Table 7). Education for nurses and other health care professionals was associated with increasing numbers of pharmacists (Table 4.12). Education for nurses was associated with teaching hospitals (Table 4.10), specialist clinical pharmacists (Table 4.11) and pharmacists with higher qualifications (Table 4.13).

Table 4.12. Variation in clinical pharmacy service provision in United Kingdom National Health Service hospitals[1] depending[2] on the total numbers of pharmacists employed.

Service (n=318)	Odds ratios[2] for numbers of pharmacists						χ^2	p value
	1-3	4-6	7-9	10-12	13-15	16+		
Acute in-patient therapy monitoring	1	2.55	4.30	N/A	3.40	N/A	6.632	0.0100
Long-stay patient therapy monitoring	1	3.42	1.93	4.10	2.02	2.64	4.855	0.0276
Participation in medical ward rounds	1	5.29	8.69	7.12	22.42	25.85	45.547	0.0000
Participation in DTC[3]	1	4.45	4.19	6.98	8.37	14.30	27.494	0.0000
Application of formulary system[4]	1	1.29	1.30	1.68	3.54	3.21	9.177	0.0025
Advice to clinical directorates[5]	1	2.37	4.08	4.45	5.38	17.44	43.457	0.0000
On-site drug information centre	1	2.56	9.15	11.93	12.11	111.3	77.540	0.0000
Education for pharmacists	1	5.58	13.58	13.54	31.80	N/A	82.631	0.0000
Education for nurses (and students)	1	5.21	6.86	7.25	7.18	50.76	49.516	0.0000
Education for health professionals[6]	1	1.26	1.27	2.18	3.85	4.32	12.215	0.0005
Pharmacy practice research	1	1.82	6.29	8.53	10.22	36.57	73.936	0.0000
Contribution to medical audit[7]	1	1.72	2.72	3.06	4.08	4.71	20.812	0.0000
Participation in pharmacy audit[7]	1	2.16	4.16	4.22	3.70	10.84	25.219	0.0000
Participation in TPN[8] team	1	2.30	6.09	5.02	18.28	15.17	53.909	0.0000
Participation in cytotoxic therapy teams	1	3.14	14.78	7.97	6.02	24.44	28.348	0.0000
Participation in PCA[9] teams	1	1.25	6.75	5.19	5.10	12.50	21.370	0.0000
Provision of TDM[10]	1	2.66	2.42	2.10	3.25	7.46	14.180	0.0002
Provision of CIVAS[11]	1	1.31	2.45	2.41	4.00	5.85	23.847	0.0000
Provision of medication histories	1	0.76	0.94	1.10	0.64	3.02	4.222	0.0399
Provision of self-medication schemes[12]	1	1.73	1.32	1.72	3.07	5.59	17.527	0.0000
Provision of patient counselling	1	1.95	2.70	3.20	3.65	4.73	18.365	0.0000
Provision of patient education	1	5.30	6.48	4.19	5.58	5.98	8.433	0.0037
Assistance with CSM ADR[13] scheme	1	1.18	1.31	1.44	2.31	2.71	8.589	0.0034

See page 112 for footnotes to this table.

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Notes to Table 4.12:

1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;
2. Results of a Chi-squared for trend analysis. Odds ratios are the probability of service provision in each group compared to the first (1-3 pharmacists) group. N/A means that there were no figures in this cell;
3. Drug and Therapeutics Committee;
4. Fewer than 100% of non-formulary requests acceded to by pharmacy;
5. Resource management units in some (279/414, 67.4%) UK NHS hospitals;
6. Other than doctors, nurses, medical students and pharmacy staff;
7. Audit is a quality assurance activity. It may be led by, and predominantly involve, doctors (medical audit), pharmacists (pharmacy audit) or others;
8. Total Parenteral Nutrition;
9. Patient Controlled Analgesia;
10. Therapeutic Drug Monitoring;
11. Central Intravenous Additive Service;
12. Also called self-administration schemes;
13. Committee of Safety of Medicines Adverse Drug Reactions monitoring scheme.

Table 4.13. Variations in clinical pharmacy service provision in United Kingdom National Health Service Hospitals[1] depending on the presence of pharmacists with higher qualifications[2].

Service	Number (%) pharmacies providing each service where pharmacists with higher qualifications[2]	
	Were not present	Were present
Participation in medical ward rounds (n=409)	63/105 (60.0)	254/304 (83.6)
Advising clinical directorates[3] (n=276)	29/65 (44.6)	150/211 (71.1)
Presence of an on-site DIC[4] (n=406)	36/104 (34.6)	208/302 (68.9)
Provision of education for pharmacists (n=408)	52/104 (50.0)	227/304 (74.7)
Provision of education for nurses (n=410)	52/105 (49.5)	213 305 (69.8)
Practice research (n=407)	18/103 (17.5)	152/304 (50.0)
Contribution to medical audit[5] (n=405)	39/103 (37.9)	163/302 (54.0)
Performance of pharmacy audit[5] (n=400)	13/102 (12.7)	95/298 (31.9)
Assistance with clinical trials[6] (n=408)	85/103 (82.5)	290/305 (95.1)
Participation in TPN teams[7] (n=396)	18/97 (18.6)	128/299 (42.8)
Participation in cytotoxic therapy teams (n=394)	9/96 (9.4)	82/298 (27.5)
Provision of a TDM[8] service (n=389)	11/95 (11.6)	72/294 (24.5)
Provision of patient counselling (n=401)	44/99 (44.4)	200/302 (66.2)
Provision of patient education (n=396)	13/96 (13.5)	89/300 (29.7)
Operation of CSM ADR scheme[9] (n=402)	38/101 (37.6)	147/301 (48.8)

Notes to Table 4.13:
1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;
2. Pharmacists who possessed diplomas or higher degrees;
3. Resource management units in some (279/414, 67.4%) UK NHS hospitals;
4. Drug Information Centre;
5. Audit is a quality assurance activity. It may be led by, and predominantly involve, doctors (medical audit), pharmacists (pharmacy audit) or others;
6. Drug-company trials and trials run by the hospital;
7. Total Parenteral Nutrition;
8. Therapeutic Drug Monitoring;
9. Committee of Safety of Medicines Adverse Drug Reactions monitoring scheme.

Table 4.14. Variations in clinical pharmacy service provision in United Kingdom National Health Service Hospitals[1] depending on pharmacists' perceptions of increased resources as a result of The Way Forward[2].

Service	Number (%) pharmacies providing each service where The Way Forward[2] -	
	Did not increase resources	Increased resources
Participation in medical ward rounds (n=401)	157/227 (69.2)	152/174 (87.4)
Advising clinical directorates[3] (n=270)	85/144 (59.0)	89/126 (70.6)
Presence of an on-site DIC[4] (n=398)	119/224 (53.1)	119/174 (68.4)
Provision of education for pharmacists (n=400)	124/227 (54.6)	148/173 (85.5)
Conduct of practice research (n=399)	71/225 (31.6)	94/174 (54.0)
Contribution to medical audit[5] (n=399)	100/227 (44.1)	101/172 (58.7)
Performance of pharmacy audit[5] (n=394)	43/224 (19.2)	64/170 (37.6)
Participation in TPN teams[6] (n=388)	69/216 (31.9)	73/172 (42.4)
Provision of TDM[7] (n=382)	32/214 (15.0)	47/168 (28.0)
Provision of CIVAs[8] (n=369)	64/208 (30.8)	71/161 (44.1)
Provision of patient counselling (n=394)	123/222 (55.4)	116/172 (67.4)

Notes to Table 4.14:

1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;
2. Department of Health. Health Services Management. The way forward for hospital pharmaceutical services. HC(88)54. London: HMSO, 1988 and similar documents in Scotland and Northern Ireland;
3. Resource management units in some (179/414, 67.4%) UK hospitals;
4. Drug Information Centre;
5. Audit is a quality assurance activity. It may be led by, and predominantly involve, doctors (medical audit), pharmacists (pharmacy audit) or others;
6. Total Parenteral Nutrition;
7. Therapeutic Drug Monitoring;
8. Central Intravenous Additive Service.

Table 4.15. Variations in clinical pharmacy service provision in United Kingdom National Health Service Hospitals[1] depending on pharmacists' perceptions of increased resources as a result of the Nuffield Report[2].

Service	Number (%) pharmacies providing each service where the Nuffield Report[2] -	
	Did not increase resources	Increased resources
Participation in medical ward rounds (n=380)	224/303 (73.9)	68/77 (88.3)
Presence of an on-site DIC[3] (n=377)	172/300 (57.3)	52/77 (67.5)
Provision of education for pharmacists (n=379)	188/302 (62.3)	68/77 (88.3)
Contribution to medical audit[4] (n=378)	142/303 (46.9)	47/75 (62.7)
Performance of pharmacy audit[4] (n=375)	72/300 (24.0)	28/75 (37.3)
Participation in TPN teams[5] (n=368)	94/292 (32.2)	36/76 (47.4)
Provision of CIVAs[6] (n=349)	87/278 (31.3)	35/71 (49.3)
Provision of patient counselling (n=373)	164/296 (55.4)	57/77 (74.0)
Operation of the CSM ADR scheme[7] (n=373)	135/299 (45.2)	41/74 (55.4)

Notes to Table 4.15:

1. Hospital pharmacies where a pharmacist was present during normal working hours and services, in addition to drug supply, were provided. The response rate was 89.9%;
2. Pharmacy. The Report of a Committee of Inquiry appointed by the Nuffield Foundation (Chair: Sir K Clucas). London: The Nuffield Foundation 1986;
3. Drug Information Centre;
4. Audit is a quality assurance activity. It may be led by, and predominantly involve, doctors (medical audit), pharmacists (pharmacy audit) or others;
5. Total Parenteral Nutrition;
6. Central Intravenous Additive Service;
7. Committee of Safety of Medicines Adverse Drug Reactions Monitoring scheme.

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4.2.4.5.   Involvement in research, audit and clinical trials.

Some pharmacies undertook practice research (Table 4.9) and 127/155 (81.9%) indicated that the researchers were registered for higher qualifications, mainly MScs (68) and diplomas (64). Larger proportions of pharmacies in SHAs (5/9) and Wales (12 22) were involved in research (Appendix X, Table 8). Performance of practice research was more common in teaching hospitals (Table 4.10), those with more pharmacists (Table 4.12), specialist clinical pharmacists (Table 4.11) or those with higher qualifications (Table 4.13), and where resources were thought to have increased due to The Way Forward[2-4] (Table 4.14). Pharmacies normally provided support services for in-house and pharmaceutical company-sponsored clinical trials (Table 4.9), more so where there were pharmacists with higher qualifications (Table 4.13). Support services frequently provided for in-house trials included dispensing the trial drugs (239/378, 63.2%), record-keeping (222/378, 58.7%) and holding and, where necessary, breaking randomisation codes (212/378, 56.1%). For drug company sponsored trials, services frequently provided included dispensing (371/378, 98.1%), record-keeping (363/378, 96.0%), liaising with the drug company (350/378, 92.6), and holding and, where necessary, breaking randomisation codes (338/378, 89.4%). In general, more SHA pharmacies provided support services for both types of trial (Appendix X, Table 9).

Many pharmacies provided assistance to those involved in medical audit but fewer were involved in pharmacy or clinical audit (Table 4.9). Compared with the UK as a whole fewer pharmacies in Northern Ireland (5/14) and Wales (8/22) contributed to medical audit. Fewer Welsh pharmacies (3/22) carried out pharmacy audit and no SHA pharmacy participated in clinical audit (Appendix X, Table 8). This may, in part, be a reflection of the extent to which audit had developed in 1992. Contributions to medical audit included provision of financial information on drug use (169/197, 85.8%), help with devising prescribing policies (134/188, 71.3%), feedback on adherence to policies (115/186, 61.8%) and information on prescribing problems (86/180, 47.8%) (Appendix X, Table 8). Pharmacy audits examined interventions, clinical pharmacy services, errors and response time. Clinical audits included multidisciplinary audit of departments and of other hospitals or their departments. Contribution to medical audit and participation in pharmacy audit were associated with specialist clinical pharmacists (Table 4.11) and those with higher qualifications (Table 4.13), increasing numbers of pharmacists (Table 4.12), and perceived increases in resources due to The Way Forward[2-4] (Table 4.14) or the Nuffield Report[5] (Table 4.15). Contribution to medical audit was associated with location in teaching hospitals (Table 4.10). A higher proportion of pharmacies in trust hospitals

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performed pharmacy audit (39/114, 34.2%) than in directly managed units (65/276, 23.6%).

4.2.4.6. Provision of specialist clinical pharmacy services.

Pharmacies in many hospitals contributed to multidisciplinary teams, such as total parenteral nutrition (TPN), cytotoxic chemotherapy and patient controlled analgesia (PCA) teams (Table 1), more so in Scotland and Wales than in SHAs (Table 8, Appendix X). Although many pharmacies provided TPN supply (271/401, 67.6%) and cytotoxic reconstitution (217/399, 54.4%) services, only team services are reported here. Participation in TPN, cytotoxic therapy and PCA teams was associated with increasing numbers of pharmacists were associated with (Table 4.12). Participation in TPN and cytotoxic therapy teams was associated also with location in teaching hospitals (Table 4.10) and the presence of specialist clinical pharmacists (Table 4.11) or those with higher qualifications (Table 4.13). Participation in TPN teams was associated with perceptions of increased resources due to The Way Forward[2-4] (Table 4.14) or the Nuffield Report[5] (Table 4.15). The provision of a therapeutic drug monitoring (TDM) service (Table 4.9) was associated with increasing numbers of pharmacists (Table 4.12), specialist clinical pharmacists (Table 4.11) or those with higher qualifications (Table 4.13), and perceptions that The Way Forward[2-4] had increased resources (Table 4.14). TDM services were unavailable in SHAs (Appendix X, Table 8). Pharmacy-run anticoagulation services were rarely, and wound care and pain advisory services infrequently, provided (Table 4.9). A higher proportion of Northern Irish (4/14) and Welsh (5/21) pharmacies provided advice on wound care and more Scottish pharmacies provided advice on pain control (8/41) (Appendix X, Table 8).

4.2.4.7. Central intravenous additives services (CIVAS).

Provision of a central intravenous additive service (CIVAS) (Table 4.9) was more frequent in Scottish (22/39) and Welsh (9/22), than in SHA (3/9) or Northern Irish (2/9), hospitals (Appendix X, Table 8). Its provision was associated with teaching hospitals (Table 4.10), increasing numbers of pharmacists (Table 4.12) and perceptions of increased resources due to The Way Forward[2-4] (Table 4.14) and the Nuffield Report[5] (Table 4.15).

4.2.4.8. Services provided directly to patients.

Medication history-taking was provided by few pharmacies (Table 4.9), except in Scotland (16/45). It was provided mainly for in-patients (56/66, 84.8%) (Appendix X, Table 10). Elderly care (5/44), psychiatric (6/44) and patients who were perceived to be having problems

with their medicines (9/44) were provided most often with this service. Self-medication (self-administration) schemes were available in many hospitals (Table 4.9) except in Northern Ireland (4/13) and SHAs (3/9) (Appendix X, Table 10). Care of the elderly (45/112), psychiatric (26/112), rheumatology (15/112) and rehabilitation (17/112) patients were the groups targeted most frequently. Patient counselling was provided frequently (Table 4.9), usually for in-patients (167/238, 70.2%) and out-patients (151/238, 63.4%). It was provided infrequently in SHAs (3/9) and more often in Scotland (32/43) and Wales (16/22) (Appendix X, Table 10). This service was provided rarely for all patients (8/129), all out patients (6/129) or for patients being discharged (2/129), but often for respiratory medicine (38/129), care of the elderly (36/129) and problem (25/129) patients. Patient education was provided for about a quarter of all patients (Table 4.9) but more often for out-patients (59/98, 60.2%) (Appendix X, Table 10). Cardiology stood out as a specialty where patients often received education (54/77). The provision of all these services was associated with increasing numbers of pharmacists (Table 4.12) and specialist clinical pharmacists (Table 4.11). Patient counselling and education were associated with pharmacists with higher qualifications (Table 4.13) and patient counselling with perceptions of increased resources due to The Way Forward[2-4] (Table 4.14) or the Nuffield Report[5] (Table 4.15).

4.2.4.9. Adverse drug reaction monitoring.

Many pharmacies assisted in operating the Committee of Safety of Medicines (CSM) adverse drug reaction (ADR) monitoring scheme. A few provided an additional ADR monitoring scheme (Table 4.9). Welsh pharmacies often operated two schemes (17/23 and 12/22 respectively). Most pharmacies ensured that doctors received the "yellow card" ADR report form (128/172, 74.4%) and some (95/172, 55.2%) ensured that the form was completed by the doctor. Almost all pharmacies operating an ADR scheme did so for in-patients. About half provided a scheme for day-patients and out-patients (Appendix X, Table 10). The provision of ADR schemes was associated with the presence of specialist clinical pharmacists (Table 4.11). Operation of the CSM scheme was associated with the presence of larger numbers of pharmacists (Table 4.12), pharmacists with higher qualifications (Table 4.13), and with perceptions of increased resources due to the Nuffield Report[5] (Table 4.15).

4.2.5. Further Analysis of Data.

4.2.5.1. Overall provision of clinical pharmacy services.

To depict the provision of all clinical pharmacy services, a "clinical service score"

representing the number of clinical pharmacy services provided by each hospital pharmacy was calculated. For this, each of the 32 services named in Table 11, Appendix X was allocated a score of one. Education of medical students was excluded because of its link with teaching hospitals. Most hospitals provided between 9 and 18 of the clinical pharmacy services (Fig 4.6). There was a positive correlation ($r=0.686$, $n=318$, $df=316$) between the score and the number of pharmacists employed which was enhanced slightly by regression of the log_{10} number of pharmacists ($r=0.7$). The scattergram and log_{10} regression curve (Fig 4.7) were curvilinear, suggesting that service provision required a critical mass of pharmacists, which was at least three, although there was a further steady increase in the number of services provided with increases in the number of pharmacists employed throughout the range. Other staffing (WTE pharmacists) or workload indices (pharmacists/100 beds served and pharmacist WTEs/100 beds) did not correlate well with the score.

4.2.5.2.   Associations between groups of hospitals providing clinical pharmacy services.

It was thought that associations would be observed between groups of hospitals based on the selections of clinical pharmacy services provided. This hypothesis was tested using cluster analysis with no assumptions or weighting being applied to the data. Attempts at cluster analysis using two subsets of hospitals, the first 34 and 40 respectively to reply, failed to identify any hospital characteristics which could be used to identify clusters and this form of analysis was abandoned. Allocation of pharmacies to groups based on different values of the clinical services score also failed to reveal any similarities between hospitals.

4.2.5.3.   Associations between the types of clinical pharmacy services provided.

Principal component analysis was used to search for associations between 32 of the services provided. A scree plot suggested that 10 factors, which accounted for 52.6% of the variance in the data (Table 4.16), were of importance. A varimax rotation enhanced factor discrimination. Many of the observed associations were intuitive. Factor one included services that require aseptic manufacturing facilities and may have been provided at hospitals with large numbers of technical staff who would compound the products and permit pharmacists the time to participate in these team services. Earlier analysis had shown that these services were associated with high numbers of pharmacists (Table 4.12). These are also high profile services that may have developed at sites with innovative pharmacy managers. Factor two services were patient orientated and may have been provided at centres with patient orientated
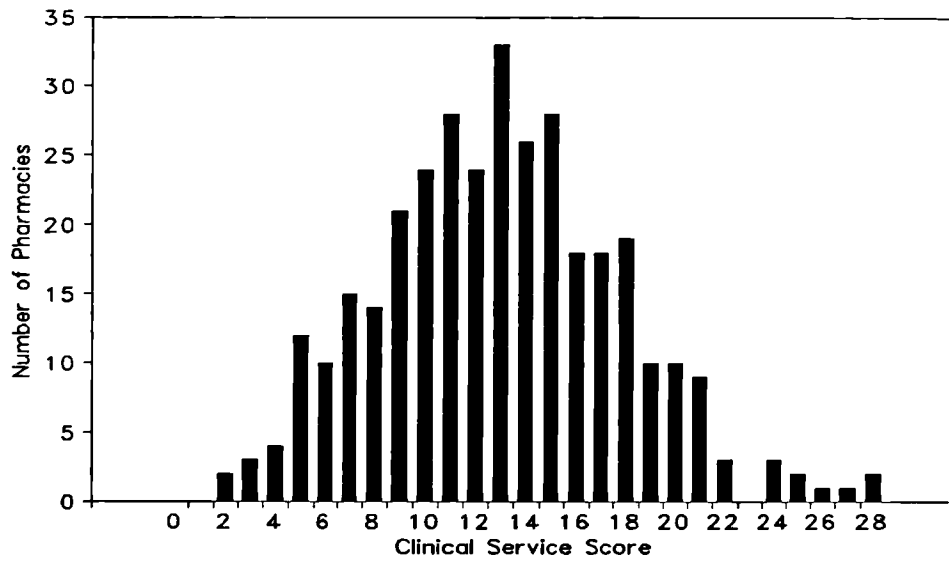
Figure 4.6.   Clinical Service Score in United Kingdom National Health Service Hospital
Pharmacies (n=340).
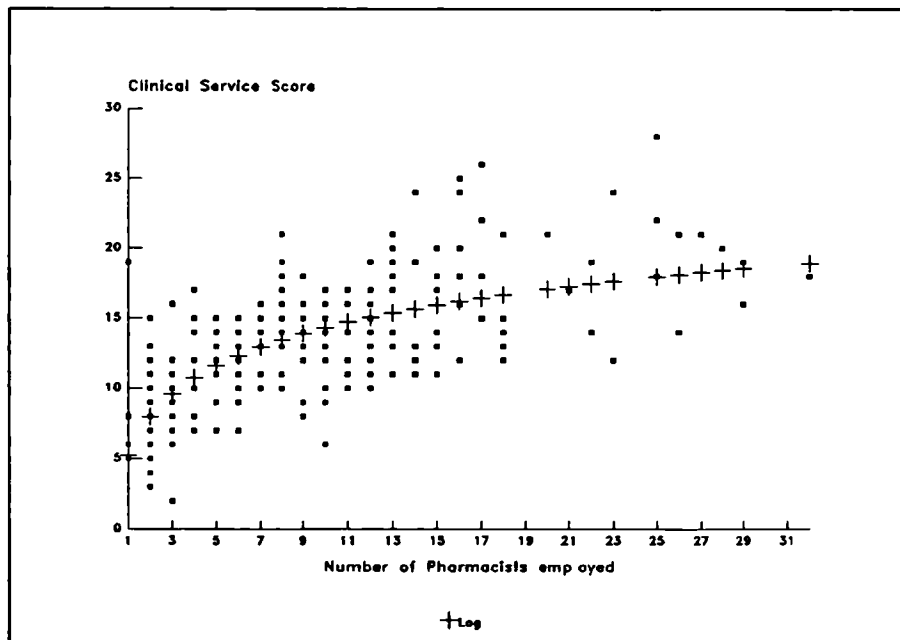
Figure 4.7.   Scattergram of clinical service score against number of pharmacists employed in
United Kingdom National Health Service pharmacies (n=318). The $\log_{10}$
regression curve is also shown.

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Table 4.16. Clinical pharmacy services forming the 10 factors identified using principal component analysis (rotated matrix scores).

Factor number	% variance explained by factors (eigenvalue)	Matrix scores	Clinical pharmacy services forming each factor
1	15.3 (4.8922)	0.5884	Participation in TPN[1] teams
		0.6038	Participation in cytotoxic therapy teams
		0.6269	Participation in PCA[2] teams
		0.5757	Provision of CIVAs[3]
2	6.0 (1.9088)	0.6042	TDM[4]
		0.6191	Advice on pain control
		0.7496	Advice on infection control
		0.5257	Advice on wound care
3	5.1 (1.6266)	0.6186	Advice on drugs for clinical directorates
		0.4991	Participation in medical audit
		0.5283	Pharmacy audit
		0.5840	Participation in clinical audit
		0.4680	Pharmacy practice research
4	4.5 (1.4374)	0.6314	DIC[5]
		0.6525	Provision of education for nurses
5	4.0 (1.2863)	0.7082	Patient medication history-taking
		0.5552	Provision of self-medication[6] schemes
6	3.9 (1.2460)	0.7647	Acute in-patient drug chart monitoring
		0.7034	Clinical trials
7	3.6 (1.1521)	0.5249	Participation on DTC[7]
		0.6822	Application of formulary system
8	3.6 (1.1430)	0.6417	Provision of CSM ADR[2] scheme
		0.6400	ADR scheme in addition to CSM scheme
9	3.4 (1.0815)	0.7821	Provision of pharmacy-run anticoagulation control
10	3.3 (1.0522)	0.8072	Long-stay patient medication chart monitoring

Notes to Table 4.16:
1. Total parenteral nutrition;
2. Patient controlled analgesia;
3. Central intravenous additive service;
4. Therapeutic drug monitoring;
5. On-site drug information centre;
6. Also known as self-administration schemes;
7. Drug and Therapeutics Committees;
8 Committee of Safety of Medicines Adverse Drug Reaction monitoring scheme.

pharmacies where nurses or others had not already provided the services. Factor three services were mainly quality orientated. Some were more often provided in trust hospitals and their association may reflect the needs of trusts to ensure the monitoring of service quality. A postulated reason for the grouping of factor four services was the provision of nurse education by DIC pharmacists. Factor five services are often provided together since one facilitates the other. Factor six services are provided by most hospitals so might be linked logically and Factor eight services are linked logically. Factor seven services may be linked since they relate to pharmacists input in drug policy creation and implementation. Factor nine is an innovative service and factor ten a service provided in response to the presence of long stay patients. Although principal component analysis shed some further light on the interpretation of the data, its contribution was limited and additional analysis was undertaken using Rasch modelling.

Rasch modelling showed the relative sizes of the barriers that existed to the provision of each service with respect to the other 32 services. The numeric results are shown Appendix X, Table 12 and they are presented graphically in Figure 4.8. Few barriers existed to the provision of services on the far left of the figure, for example drug chart monitoring and assistance with clinical trials. Those on the far right, such as the provision of education for medical students and anticoagulation services, were infrequently provided, implying that there were some barriers to their provision.

4.2.6. Clinical Pharmacy Service Provision in Relation to Recommendations made in The Way Forward, the Nuffield Report and other Important Documents.

The provision of clinical pharmacy services in 1992 was compared with the recommendations made in The Way Forward[2-4], the Nuffield Report[5], and the statements on clinical pharmacy made by the UKCPA[7] and the RPhOs' Committee[6] (Table 4.17). There are some differences in these documents but all four concurred on the provision of drug information, ADR monitoring and practice research. They appear to agree in spirit on several others, such as prescription monitoring and education of non-pharmacists, but vagueness in the definitions of clinical pharmacy, especially in the Nuffield report[5] reduced the number of services on which explicit agreement was present. Most services that were recommended in three or more documents were frequently provided; the exceptions were ADR monitoring and therapeutic drug monitoring. A few services recommended in one or more of these documents were not specifically inquired about in the questionnaire and several services not mentioned in these
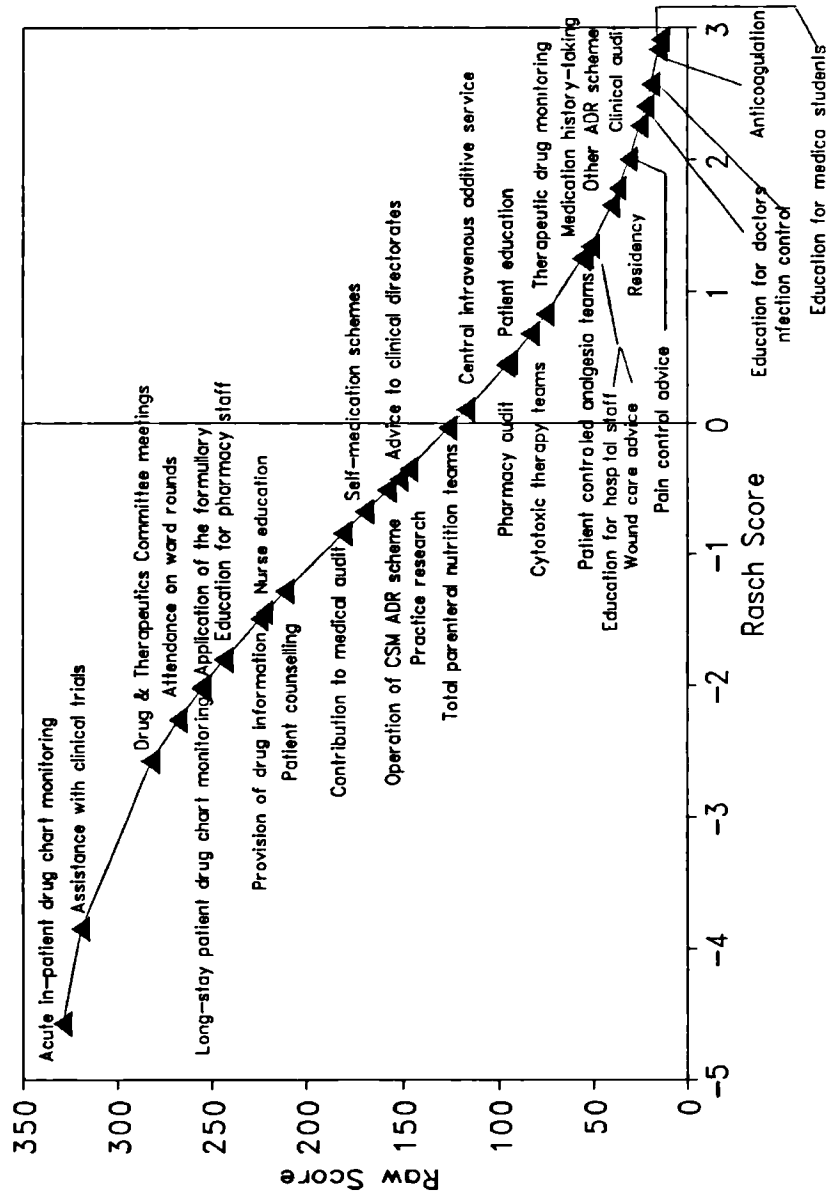
Figure 4.8.   Results of Rasch analysis: Representation of relative ease of provision of clinical pharmacy service in United Kingdom National Health Service hospitals.

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Table 4.17. Comparison of Clinical Pharmacy Service Provision in United Kingdom National Health Service hospitals with Recommendations made in The Way Forward[1], the Nuffield Report[2] and other documents[4,5].

Service	Actual Provision (%)	Recommended by:			
		The Way Forward[1] (✓)	Nuffield[2] (●)	UKCPA[3] (★)	RPhOs[4] (▼)
Prescription monitoring	96	✓		★	▼
Drug information	91[9]	✓	●	★	▼
Activity on Drug & Therapeutic Committees	84[10]	✓			▼
Operation of formularies	87	✓			▼
Medication history-taking	16	✓			
Operation of CSM ADR[5] scheme:	46	✓	●	★	▼
Operation of an additional ADR scheme[5]	13	✓	●	★	▼
Contribution to therapy decisions on ward rounds	70	✓	●	★	
Formal TDM[6] service	21	✓	●	★	▼
Discharge counselling	42	✓			
Support for clinical trials	92	✓			
Practice research activity	41	✓	●	★	▼
24 hour service[7]	10	✓	●		
Education for pharmacy staff	68		●	★	▼
Patient counselling	60		●	★	▼
Patient education	25			★	
Education of nurses	64		●	★	
Education of doctors	7		●	★	
Education of health care staff	15		●	★	
Central intravenous additive service	37		●	★	
Provision of financial information on drug use	91				
Participation in cytotoxic therapy teams[8]	23				▼
Participation in pain control teams[8]	16				▼
Participation in nutrition teams[8]	38				▼

See page 125 for footnotes to this table.

Notes to Table 4.17:

1. Department of Health. Health Services Management. The way forward for hospital pharmaceutical services. HC(88)54. London: HMSO, 1988 and similar documents published in Scotland and Northern Ireland;

2. Pharmacy. The Report of a Committee of Inquiry appointed by the Nuffield Foundation (Chair: Sir K Clucas). London: The Nuffield Foundation 1986;

3. United Kingdom Clinical Pharmacy Association Statement on Clinical Pharmacy, 1983;

4. Harrison PI, Standing VF and Watling JJ. Clinical Pharmacy. A statement from the Regional Pharmaceutical Officers' Committee, 1988;

5. Committee of Safety of Medicine or additional adverse drug reaction monitoring schemes;

6. Therapeutic drug monitoring;

7. Taken to mean a residency service;

8. The figures provided refer to participation in patient controlled analgesia and total parenteral nutrition teams;

9. On-site drug information centres were present in 60% of sites but up to 91% of sites provided various types of drug information;

10. Pharmacists attended Drug & Therapeutic Committee meetings in 96.5% of the 87.2% of sites that had such committees. The compounded figure is 84.1%;

11. Formularies were applied in 88.6% of the 87.2% of sites that had them. The compounded figure is 77.3%.

documents were provided by many hospital pharmacies. Clearly many recommendations made in these documents have been adopted by UK NHS hospital pharmacies.

4.2.7. Limitations.

The data collected in this questionnaire were self-reported. The questionnaire was extensively tested for face and content validity but it was possible only to test it for inter-rater and parallel forms reliability using a small number of questionnaire items. Despite the similarities between responding and non-responding pharmacies in the UK in terms of location in medical school teaching hospitals, it remains possible that responders differed from non-responders in fundamental ways that were not measured. Any such effect, however, would be small due to the low non-response rate (10.1%) and the fact that this was a census rather than a survey based on a sample.

4.3. Conclusion.

Clinical pharmacy services were provided to some extent within UK NHS hospitals by pharmacy departments. Service provision to primary care was less comprehensive.

The levels of clinical pharmacy service provision to primary care were low in general. With the exception of drug information, few services were provided to GPs, community pharmacists, patients and other health care professionals and institutions in primary care. In contrast, nurses working in primary care received moderate levels of services such as education and advice on the use of medicines. The provision of most services was associated with perceived increases in resources due to The Way Forward[2-4] or the Nuffield Report[5].

Within all UK NHS hospitals, clinical pharmacy services were available to some extent and some hospital pharmacies provided many services. Some services, such as prescription monitoring, support for clinical trials and active participation in DTCs, were normally provided by UK NHS hospital pharmacies with little variation. Others, such as education for medical students and doctors, infection control and anticoagulation control services, were provided rarely. There was pronounced variation in the provision of some services such as residency. There was firm evidence to support the existence of associations between the provision of services and the presence of increased numbers of pharmacists, specialist clinical pharmacists and pharmacists with higher qualifications. There was evidence that a critical

mass of pharmacists was required to provided many services. There appeared to be a systematic variation in the provision of services between teaching and non-teaching hospitals and amongst constituent countries of the UK and SHAs. There was also an association between the provision of services and perceptions of increased resources due to The Way Forward[2-4] and the Nuffield Report[5]. There was evidence that the provision of certain clinical pharmacy services influenced the likelihood of the provision of others and there was an indication that some services were more difficult to provide than others. Finally, there were no factors measured in the questionnaire that could be used to predict service provision.

CHAPTER V

AN ASSESSMENT OF THE EVALUATIVE
LITERATURE ON UNITED KINGDOM HOSPITAL
CLINICAL PHARMACY SERVICES

5.1. Introduction.

Evaluative literature on United Kingdom (UK) hospital clinical pharmacy services was examined to ascertain if pharmacy interventions were economically effective and improved patient outcome. It is recognised that literature exists in general health services research that examines the effectiveness of related services, such as the effectiveness of non-pharmacy interventions to change doctors' practices. This has not been included here on the grounds of brevity.

The searches described in Chapter III yielded many publications. Few were evaluations and, of those that were, most were poorly performed. Difficulties in realistically applying the criteria listed in Table 3.3 (Methods) led to the ranking of evaluative studies for each service area according to three criteria, namely study strength, size of effect and generalisability. All studies that were included are described in Appendix XI but only information from the strongest studies is included in tables in this chapter. The chapter is divided into sections, each addressing a category of services. Descriptive and evaluative data are criticised and suggestions are made on the direction that future research should take.

5.2. Evidence from the UK Literature of the Effectiveness of Hospital Clinical Pharmacy Services.

5.2.1. Medication Monitoring.

The services included here were ward pharmacy, prescription monitoring and the review of individual patients' therapy.

5.2.1.1.   The evidence. (see Appendix XI for descriptions of studies)

In the mid 1960s pharmacy sought ways to make drug use in hospitals safer by helping design prescription charts[24,119] and by sending pharmacists onto the wards[24,120,121]. Early reports of ward pharmacy described the ward pharmacist's activities[120,121] and the potential benefits of the service to patients and to the hospital[22] but did not evaluate them. An initial assessment of needs was probably provided in 1965[19]. More recent assessments have concentrated mainly on the frequency of ward pharmacists' visits[122], rather than the need for them, or have assessed needs in particular specialties such as mental health[123], or at specific points in a patient's stay such as at discharge[124]. Assessments have addressed also the need to monitor prescriptions for

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interactions[125] and for general quality[126]. The results suggested that prescription monitoring and ward pharmacy are necessary. In addition, numerous studies have described the problem of monitoring prescriptions in various clinical situations [23,127]. Recently, guidelines for prescription monitoring have been provided[128]. A few studies[129-131] have addressed the nature of the work carried out by ward pharmacists or described new approaches to the assessment of their work[132 135]. Where doctors' views on ward pharmacy were sought[136-140], most were satisfied with the service[236,140] and accepted the ward pharmacist's role[136-139]. Nurses, when surveyed, ranked the ward pharmacy service highly[141,142].

The first evaluation of ward pharmacy was published in 1981[143]. It was followed by several more which purported to evaluate prescription monitoring or ward pharmacy services or to describe such activities[124,125,129-131,133,140,144-156]. With a few exceptions[131,150,151], studies were carried out in a single hospital thus limiting their generalisability. Most measured processes, such as interventions in response to incorrect prescriptions[124,125,131,133,143,144,146,148-156], and even then, rarely evaluated the process completely; one measured the number of prescribing inadequacies that had been missed by the pharmacists[143]. A few addressed economic factors, such as the cost of the service or changes in drug expenditure as a result of the service[145,149,150,153,156], or patient care factors, such as perceived improvements in patient care or standards of service[133,143,144,150,152-156], but these studies were often descriptions or incomplete evaluations. Only a few[150,154,155] included an independent assessment of the effect of the service, more usually a subjective assessment of the perceived value of the interventions was provided. The assessors were pharmacists, doctors or a combination of both. Most evaluations were uncontrolled or before/after studies with consequent potential for confounding due to non-comparability of groups or time periods. Bias was possible since pharmacy staff always gathered the data and were aware of the study. The reliability of variables and the reliability, completeness and accuracy of data collection were not addressed.

5.2.1.2.   Summary of evidence.

Most of the studies listed in Table 5.2.1. show that pharmacists' recommendations to alter therapy were accepted by doctors. Where interventions were assessed for their perceived contribution to patient care, most were thought to improve the process of care but were rarely thought to have contributed significantly. These perceptions were not supported by economic data, such as potential savings through avoidance of litigation due to errors. The evidence suggests positive effects of medication monitoring services but design problems and the limited

scope of most studies make it difficult to claim a definite contribution to care or economic outcomes.

All studies were open to bias in data collection; many were also open to bias in the assessment of the value of the interventions. None evaluated the service against a "no service" scenario in a multi-centre study. This would probably be impossible now on ethical and practical grounds. Most were surveys and had no controls; a few were before/after studies with little evidence that potential confounding influences were excluded. No full economic evaluation of these services has been carried out.

5.2.1.3. Suggestions for further research.

There is a need to assess the effect of prescription monitoring on patient care in multi-centre studies that address economic and health care effects. Given the probable ethical and practical problems of withdrawing prescription monitoring services, future work could not include a control group (no service). Studies also need to address the need for prescription monitoring in a variety of settings, taking into account the likely effects of errors on economic and patient outcome. Completeness and reliability of data collection needs attention. Interventions missed by pharmacists must be recorded and assessment must be carried out by an independent panel. Future work should also address the issue of how prescription monitoring is best performed and by whom (or what technology). Can any aspects be performed by non-pharmacists? Comparative intervention studies may be able to address these issues.

Table 5.2.1.   Evaluative Studies on the Pharmacist's Role in Medication Monitoring.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1981	Leach RH et al[143]	Ward pharmacy	Prospective/retrospective before/after survey of prescription charts, workload and recipients' opinions	46% reduction in errors/patient and 43% in errors /prescription on introduction of the service. Most recommendations accepted. 46% response rate to users opinion survey. Roles suggested were supply, assuring safe and effective use of drugs, provision of information and detection of interactions.	No
1981	Forbes DR[145]	Ward pharmacy	Prospective, before/after, survey of costs of dispensing prescriptions	Pharmacists' time taken to dispense items and nursing time visiting the pharmacy fell. Total costs rose. Data insufficient to indicate economic viability of the service.	No
1990	Hawkey CJ et al[150]	Ward pharmacy	Prospective survey and assessment of prescription monitoring interventions	Interventions were made on 2.9% (769) prescriptions. 86% (639) were accepted by doctors and 575 led to prescription changes. Most were judged to be of little medical consequence and few saved money on drugs.	Yes
1992	Maguiness JA et al[153]	Monitoring of discharge prescriptions	Prospective, before/after survey of interventions on discharge therapy	Monitoring by ward pharmacists reduced queries by dispensary staff from 21% to 4.8%. Ward pharmacists intervened on 21.6% of prescriptions, 34% of which would not have been detected by the dispensary. Small savings were made in dispensing time.	No
1992	Barber PA[154]	Prescription monitoring	Prospective survey and assessment of prescription monitoring interventions	1585 interventions were recorded in 5 months. 81% resulted in alteration of the prescription. 0.5% were considered to be life saving, 3.7% prevented serious toxicity, 24.7% optimised patient care and 32.8% improved the standards of practice.	No
1992	Eadon H[155]	Ward pharmacy	Prospective survey and assessment of prescription monitoring interventions	1315 interventions were recorded in 12 months (accepted and rejected by doctors). 53% were considered to have led to an improvement in patient care and 2% prevented major problems.	No

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5.2.2. Formation of Hospital Drug Use Policy.

Much descriptive data support pharmacists' involvement in the creation, implementation and assessment of hospital drug policies such as formularies and prescribing policies. Policies can help control drug expenditure, improve prescribing and enhance the quality of care. They are created usually by multidisciplinary committees (Drug & Therapeutics Committees (DTC)) or groups such as clinical directorates and are often assessed using drug utilisation review (DUR) or evaluation (DUE).

The first committee addressing pharmacy and drug-related issues in England was set up in 1948[46]. By 1983, there were 198 such committees in the UK[47]. In a 1992 study[157], it was found that many DTCs were involved in creating and managing hospital formularies. Formularies first appeared in 1970[48]. By 1986, 36% of UK districts had a formulary system that covered most drug categories[49]. A 1993 study of hospitals with more than 500 beds found that 60 of the 66 responders operated a formulary[158]. Based on opinion, and crude calculations of drug expenditure, it has been suggested that formularies contribute to improved use of drugs and patient care[159]. Descriptive studies have noted changes in prescribing and drug expenditure when a variety of formularies[149,160-71] and prescribing policies[164,166,169,172-186] were used in hospitals. The extent of non-compliance with formularies[48,149,160,163,165,167,171] and policies[178,180,182,184,185] and the reasons for this have been examined[171]. Other reports suggested that pharmacists have a valuable role to play in evaluating critically the literature on new drugs[187], implementing formularies[170,188,189], creating intravenous drug administration policies[190,191], and performing DUR to inform policy making for the benefit of patients and hospitals[192,193]. Some studies have attempted to consider patient care or outcome[173,175,179,184]. One described a drug costing system that takes patient outcome into account in policy creation[194]. Audit and clinical directorates were thought to have facilitated pharmacists' involvement in drug policy making[179,195]. Pharmacists' involvement in drug policy making has been welcomed by most doctors and nurses[137-139,142,158,191]. Some doctors felt, however, that formularies infringed on their rights to prescribe and they used them rarely[169,189].

5.2.2.1.   The evidence.

An early study showed that the introduction of a formulary had little effect on drug expenditure[160]. These results, and those of a later study[181], showed that, on its own, a formulary or prescribing guidelines were unlikely to change practice. There was a need to operate a system that supported the prescribing guidelines. Some studies showed that changing

to cheaper equivalent drugs reduced expenditure[177] as did introducing policies for specific therapies, such as for laxatives[179,182], antibiotics[185], thrombolytics[180], and iron therapy[196]. The limited list also had a discernable effect on expenditure in certain of the affected classes of drugs[197]. Studies concentrating on process showed that a high level of compliance with formularies and prescribing policies could be achieved[163-165,167,171,178,180,182,184,185] and suggested that the process of care was improved as a result.

5.2.2.2. Summary of evidence.

A body of mainly descriptive evidence strongly suggests that pharmacy participation in the creation and implementation of hospital drug use policy reduces drug expenditure. A smaller number of studies showed that doctors prescribe in accordance with these drug policies. Most studies assessed the effect of prescribing policies on drug expenditure (acquisition costs) and ignored other costs or consequences, such as the production, training and monitoring costs for formulary creation and implementation, and the non-pharmacy costs of using one type of drug in place of another. In addition, no study assessed the effects of drug policy on patient care or quality of life. Design flaws included confounding. This was especially problematic in before/after studies due to the absence of details on patient type and staff factors. Bias was a potential problem also since pharmacists usually carried out all the measurements and had a vested interest in showing savings. With one exception[182], studies were performed in a single hospital thereby reducing generalisability. Finally, the policies and the degree of pharmacist involvement varied from a full formulary system (with enforcement and educational components) to the production of a list of permitted medicines. This makes it difficult to amalgamate the results of studies. The studies support, but do not prove, the beneficial effects of pharmacist involvement in drug use policy in UK NHS hospitals.

5.2.2.3. Suggestions for further research.

Most hospitals involve pharmacy staff in creating and implementing drug use policy. This would make it difficult to perform a study comparing hospitals with and without pharmacy involvement in drug policy. The general acceptance of pharmacy's effectiveness in controlling drug expenditure may make such a study unnecessary. Future research should assess the effects of changes in drug policy on total costs to the hospital, on costs to the primary care sector (especially where joint prescribing policies exist) and on patient care factors. The increasing use of pharmacists to help create drug policy and treatment protocols within the directorate structure has economic and patient care implications. Whilst clearly defined and

carefully chosen therapeutic regimens may have educational benefits for health professionals and improve the care of some patients, their effects on drug costs for the entire hospital and the cost of their creation and implementation may not be favourable. There is a need to assess the economic and patient care consequences of joint hospital-primary care prescribing policies and formularies. Research in these areas would involve several professions, occupational groups and patients. Studies are required also to examine the most effective means of creating, implementing and updating drug policy, including policies on the safe administration of medicines. The cost-effectiveness of several new technologies and techniques that are being used currently in drug policy assessment, such as computers and audit, requires evaluation.

Table 5.2.2. Evaluative Studies on the Pharmacist's Role in forming Hospital Drug Use Policy

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1984	Merton & Sutton Health Authority[160]	Formulary	Prospective time series evaluation of drug expenditure and formulary compliance	Compliance was 96%. Items stocked fell by 23% and their value by £24,864 but the formulary did not decrease overall drug expenditure (patient throughput, drug volume and price changes taken into account) due to lack of implementation of, and pharmacy control over, the formulary.	No
1991	Riley MR & Cooke J[177]	Prescribing policy	Retrospective time series evaluation of the effects of a nitrate prescribing policy on drug expenditure	Actual spending was £24,000 and £21,000 less than projected expenditure.	No
1992	Goodyer LI et al[178]	Prescribing policy	Prospective time series evaluation of the effects of a laxative prescribing policy on prescribing	The policy was complied with but no data were shown on drug costs or patient care factors.	No
1993	Patel K[179]	Prescribing policy	Prospective before/after evaluation of the effects of a laxative prescribing policy on drug expenditure	Reduction of 50% on drug expenditure in the first year. This was maintained in the next year. No data were provided on patient comparability or throughput.	No
1989	Upton DR[185]	Prescribing guidelines	Prospective before/after study using drug utilisation review	Prescribing of antibiotic courses of 6 days or less increased from 31.7% to 53.8% (therapy) and from 84.3% to 92.8% (prophylactic).	No

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Table **5.2.2.** continued

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1988	Upton DR et al[181]	Prescribing policies	Prospective before/after survey of laxative use	Defined daily doses/100 bed days increased by 7% and expenditure by 65% but no data were provided on patient type.	No
1991	Morgan DJR et al[180]	Prescribing policy	Not an evaluation but a retrospective audit of thrombolytic use	100% compliance with prescribing policy. Potential savings of £27000 were estimated.	No
1991	Lewis C[182]	Prescribing policy	Prospective before/after study of a laxative prescribing policy	Prescribing increasingly complied with the policy with consequent savings of £1100 in the first month.	Yes
1988	Baker JA et al[163]	Formulary	Not an evaluation but a retrospective audit of the effect of an educational formulary	Compliance was in excess of 99%. Drug expenditure fell by £0.8-1.0 million pa compared to previous annual rises of 10-15% at the hospital and current rises of 3% at other hospitals.	No

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5.2.3. Provision of Information.

Information may be provided by a drug information centre (DIC) or by various hospital pharmacists via the ward pharmacy service or other services. It may be provided to many recipients, including hospital and primary care professionals, and in many situations, such as at discharge, and following telephone or personal inquiries. This section considers evidence for the effectiveness of the provision of information on drugs, rather than the provision of therapeutic advice (which is addressed in Section 5.2.4). This section concentrates also on the provision of information to those in hospitals rather than to those in primary care (see Section 5.2.11).

DICs were first established in the UK in 1970[198]. The national network was formed in 1975[199] and has been described in detail by several authors[47,50]. Many documents have enumerated the activities performed by DICs[47,50,198,200-209]. The National Poisons Information Service also provides information and therapeutic advice but it will not be considered in this review since it is not a pharmacy-run service[210]. Despite the existence of a national co-operative network of DICs, some feel that a national policy should be created to ensure that prescribers obtain good quality prescribing information[211]. Computerised systems have been developed in an effort to do this[212]. Doctors' awareness of the existence of DICs, and their use of the service, are moderate and are increased by working at a site with a DIC[213].

5.2.3.1.   The evidence.

Pharmacy's role in providing drug information is generally accepted by hospital doctors[137,138] and nurses[141,142]. Studies have found that the acceptability and perceptions of the usefulness of drug monographs and bulletins are high among medical[214,215], nursing and pharmacy staff[215]. It has been claimed that the service can contribute to the implementation of formularies[161] and prescribing policies[196]. The results of a single study that evaluated the effect of a drug information bulletin on the prescribing of oral nitrates support this although the study was open to bias[216]. Many aspects of the service have not been the subject of a full evaluation although several workload studies have provided useful information on costs[202], the nature, numbers and sources of queries[47,50,198,202-208,210] and the resources[207] and time[198,203,205] used to reply to them. One study looked at efficiency factors at a main DIC and its sub-centre but this was a management study rather than a full economic evaluation[203]. In 1992, a study was performed of one regional and two district DICs in Wales[208]. The study assessed the perceived usefulness, and the effects on patient therapy, of replies to inquiries made by hospital and

general practice doctors and hospital and community pharmacists. In hospitals, most answers (94%) were found to be useful and the information had been used to influence patient therapy (66%). In primary care, 68% of the replies to General Practitioners (GPs) and 37% of those to community pharmacists had directly influenced patient therapy. The study suggested that DICs can contribute to the process of care. It was not an evaluation. It did not directly measure outcome but assumed that the patient benefited from the use of DIC-provided information.

5.2.3.2. Summary of evidence.

No comprehensive evaluative studies have been carried out on drug information services. Workload studies have provided details of inputs (costs per query) to the service and outputs (such as the numbers of queries answered, the perceived usefulness of information, the use to which information was put and the bulletins produced). No studies, however, have assessed service effectiveness in economic or patient care terms. The only evaluative study was one on the effect of a bulletin on the prescribing of oral nitrates. Several regions are still collecting workload data (personal communication, A Joshua, 1994) and may be linking these to effects on care processes. The data are not yet in the public domain.

5.2.3.3. Suggestions for further research.

There is a need to carry out a full costing study of the national co-operative DIC network. The nature and effects of various drug information (DI) services must be defined. The costs of the provision of DI services to hospitals and to primary care needs separate assessment. Other methods of providing a comparable service may then be explored and compared on economic and effectiveness criteria with the present service. In addition, there is a need to explore the contribution that a service which provides information makes to patient outcome.

Table 5.2.3. Evaluative Studies on the Pharmacist's Role in the Provision of Information.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1990	Hall T[216]	Drug information bulletin	Prospective before/after study of prescribing patterns	There was a 36% increase in the use of a nitrate-free period and a trend to bring prescribing in line with the advice in a drug information bulletin.	No
1992	Adams PR[208]	Drug Information Centres	Prospective assessment of the perceived usefulness, and use, of replies to drug information inquiries	Hospital doctors and pharmacists (94% of each group) found the information provided useful. In 66% of cases patients' therapy changed as a result of the provision of information. GPs (68%) and community pharmacists (37%) used the information to influence patient care.	Yes

5.2.4. Provision of Advice on Therapeutics.

The service addressed here is the provision of advice by pharmacists to health professionals in secondary care on ward rounds or as part of a team. Advice provided via other services, such as prescription monitoring (see Section 5.2.1), is not included here.

Many studies described pharmacists' activities on ward rounds[152,217,221] or in other settings where they provided advice on therapy directly[217,219,222-224], as part of a multidisciplinary team[225-228], in out-patient clinics[229], at day care facilities[227,230] or via prescribing policies[231]. Recently, increased activities have been reported in these areas. This increased activity is thought to have been facilitated by the development of clinical directorates[232,233]. Studies that assessed the extent to which doctors accepted pharmacists' advice and the pharmacist's role in provision of advice found a high rate of acceptance[152,218,219,221,222]. Positive results have been found also in surveys that assessed doctors' views on pharmacists' advisory role[137-139]. This role was sometimes less well-accepted than more traditional roles, such as the provision of drug information[137,138]. Nurses' views on the advisory role have been less positive than their views on the more traditional roles[142]. A number of studies discussed the effects of pharmacists providing a more active advisory service[233] and described methods of assessing the effects of such services[234-236].

5.2.4.1.   The evidence.

The studies in Table 5.4 provide evidence that pharmacists were considered by medical and/or pharmacist assessors to have contributed to patient care[222,225,226,228,237] and the economic use of medicines[221,225] on rounds. The studies by Cloethe and Heath[221], in a psychiatric unit, and Trewin and Town[222], in a geriatric unit, are among the best examples of these kinds of research. The former study was a time series evaluation that followed the same patients for 12 months. Peer review of pharmacists' interventions by a multidisciplinary group reduced the potential for interventions to have adversely affected patient care. Although it was not a full economic analysis, the study included the main costs of therapy and, if anything, underestimated the full benefits of pharmacists' contributions. The latter study also used physician and pharmacist ratings of the value of interventions. The close agreement between ratings provided reassurance of the validity of results.

5.2.4.2.   Summary of evidence.

The studies in Table 5.4 supply evidence that the advice provided by pharmacists contributed

to patient care or to the economic use of medicines. Most were poorly controlled or uncontrolled and were open to confounding and bias. All were carried out in a single hospital and often involved a single pharmacist in a particular ward or specialty. The two studies discussed above were stronger in design and indicate that pharmacists can have a moderate effect on the quality of prescribing and medication costs in geriatric medicine and psychiatry.

5.2.4.3. Suggestions for further research.

The provision of advice on drug therapy occurs in a variety of settings, not simply on ward rounds, although it is not clear from any of the above studies what the most cost-effective method of providing advice might be. Pharmacists' increased integration into ward teams via the clinical directorate structure should be the subject of future studies. So also should the use of other methods that provide prescribers with advice on therapy, such as computer systems. There is a need for work to determine the needs of prescribers, particularly when pharmacy advice is not freely available. Future work needs to address the effectiveness of pharmacists' advice on the reduction of the total cost of care, including staff time and drug administration costs, not simply on the reduction of drug costs. Where possible, studies should include some measure of the effects of this advice on patient outcome. This can be achieved using multidisciplinary panel ratings of the value of interventions or the changes in a clinical measure in specific cases. The linking of patient outcome to pharmacy advice may be difficult. Pharmacists may have to try to link outcome to their input in large studies that compare the level and type of pharmacy input in different hospitals. This type of study will also address generalisability, the lack of which is one of the main problems in pharmacy studies to date. Studies need to be designed to avoid bias. More imaginative use of data recording and computers may assist in this task.

Table 5.2.4. Evaluative Studies on the Pharmacist's Role in Provision of Advice on Therapeutics.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1986	Walker R & Bussey RA[237]	Ward rounds	Prospective time series evaluation of a pharmacist's contribution on rounds	Interventions increased over time and with number of rounds attended. Most of the 988 (85%) that were accepted were thought to have contributed to patient care and optimisation of drug expenditure. Most of those rejected were considered to be worth making.	No
1986	Trewin VF & Town R[222]	Case conferences	Prospective survey of pharmacists' contributions in case conferences	Most of 465 interventions were rated as extremely, definitely or somewhat helpful in patient care by doctors and an independent pharmacist. 54% resulted in prescription change.	No
1992	Bishop SMJ et al[225]	Therapy review	Prospective controlled before/after study of pharmacists' effects on medication changes and costs	102 interventions were made in the test group. 51% were accepted. The mean number of drugs/patient in the test group decreased by 7%. Cost of drugs/patient day fell by 6% (rise of 11% in the control group).	No
1987	Cloethe B and Heath PE[21]	Psychiatric ward rounds	Prospective before/after study of a pharmacist's effect on medication changes and costs	37 ward rounds were attended (103 pharmacist hours=£706). Of the 180 interventions 150 led to prescription changes. Drug costs were reduced from £863.20 to £518.18. Items prescribed/patient fell from 3.75 to 2.66 (29%). Cumulative savings = £3,212.90 (£2,500 net) pa.	No
1991	Pashley EM & Biggins CA[226]	Therapy review	Retrospective before/after study of a pharmacist's effect on prescribing	A pharmacist succeeded in reducing the use of polypharmacy in an institution for the mentally handicapped over 5 years.	No

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Table 5.2.4. continued

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1989	Taylor D[228]	General clinical pharmacy involvement	Prospective before/after study	There was a reduction in the mean number of items/chart, the amount of regular anticholinergics and benzodiazepines prescribed, and in the number of charts with poorly-written prescriptions.	No

5.2.5. Specialist Services Provided as Part of a Multidisciplinary Team.

The services examined here include total parenteral nutrition (TPN), cytotoxic, pain therapy and other team services. As early as 1967 pharmacists were advocating their integration into therapeutic teams[235]. There are several studies of pharmacists' contributions to teams in specialist areas such as oncology[238,239], psychiatry[225,226,228,240-242], paediatrics[243], pain control[65,244,245], cardiopulmonary resuscitation[246,247] and parenteral nutrition[248-250]. Surveys of doctors'[138,139] opinions on pharmacists' participation in the ward team in individual hospitals have been both negative[138] and positive[139] but the report of a joint Royal Colleges working party on post-operative pain control was encouraging[251]. In addition, the provision of satellite pharmacy services may facilitate the integration of pharmacists into health care teams[252].

5.2.5.1. The evidence.

Evans[238] suggested that pharmacists, acting as part of a team with other health professionals, can improve the quality of care of patients receiving chemotherapy. Patients who received counselling showed a significant improvement in well-being and in knowledge of their treatment and reacted very positively to the pharmacist's efforts. The study may suffer from bias and possible non-validity of the results. In addition, the results are not generalisable. Pharmacists' participation in team care in psychiatry, also, may improve patient care and drug use[225,226,228,240-242]. Some studies have been mentioned already (Section 5.2.4). All studies may suffer to some extent from the problems of bias, and the lack of validity and generalisability. Health professionals, providing their views in a questionnaire, thought that pharmacists' participation in a cardiopulmonary resuscitation team in a single hospital was useful and should be continued[247] but no evaluative study has been performed on this service or on patient controlled analgesia (PCA) services. An assessment of the value of a pharmacy-run TPN service[248] was open to confounding but provides some evidence that pharmacists can improve the treatment of patients receiving parenteral nutrition.

5.2.5.2. Summary of evidence.

Many of the studies cited in Table 5.5 provide evidence that pharmacist participation in team services improves the process of care, reduces drug expenditure and may improve patient outcome. Problems in study design, including lack of controls, confounding, incomplete evaluation (failure to measure all costs and consequences) potential bias, and lack of generalisability, mean that the effect of pharmacists in these areas requires further evaluation. Even in psychiatry, where the best and greatest number of studies have been performed,

further work is needed. None of the studies were full economic evaluations.

5.2.5.3. Suggestions for further research.

There is a need to assess the precise contribution that pharmacists can make in team services. This should be followed by multidisciplinary evaluations of the effects on patient care and economic factors. Studies need to be controlled or, if that is impossible, protected against confounding. They should be multicentre and measure all costs and consequences in an unbiased fashion. In many cases it may be possible for pharmacy to demonstrate an effect on various secondary outcomes or process measures. It may be much more difficult to show if the pharmacist has an effect on outcome because of the multidisciplinary team nature of the services.

Table 5.2.5. Evaluative Studies on the Pharmacist's Role in Uni- and Multidisciplinary Specialist Services.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1987	Evans TC[238]	Counselling of oncology patients	Prospective controlled time series study of changes in symptoms and well-being	Non significant improvement in anxiety and sleep scores but information on therapy and overall feeling of wellbeing were significantly better after follow-up counselling.	No
1989	Branford D[240]	Participation in a psychiatry team	Prospective time series study of changes in drug use and costs, and patients' well-being	Reduction in the amount and cost of drugs used by patients was accompanied by improved functioning.	No
1992	Cloete B et al[241]	Participation in a psychiatry team	Prospective before/after study of drug use and costs	The amount and cost of drugs used fell and patients' mental scores increased. The cost of pharmacists' time was offset by drug savings.	No
1991	Pashley EM and Biggins CA[226]	Presentation of therapy reviews to psychiatric teams	Retrospective before/after study of a pharmacist's effect on prescribing	A pharmacist succeeded in reducing polypharmacy in an institution for the mentally handicapped over 5 years.	No
1992	Bishop SMJ et al[225]	Presentation of therapy reviews to psychiatric teams	Prospective controlled before/after study of drug use & cost	Reduction of 7% in mean number of drugs/patient and of 6% in cost/patient/day in the test group (rise of 11% in the control group).	No
1994	Ferguson BG and Weirs T[242]	Participation in a psychiatry team	Prospective before/after study of drug use	Reduction of 48% in mean daily dose of neuroleptic/patient	No
1989	Hebron BS et al[248]	Total parenteral nutrition	Prospective before/after study of process and outcome	A pharmacy-run service improved the process of care, reduced costs and may have contributed to improved final outcome.	No

Table 5.2.5. continued

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1989	Taylor D[228]	General clinical pharmacy involvement in psychiatry	Prospective before/after study	There was a reduction in the mean number of items/chart, the amount of regular anticholinergics and benzodiazepines, and in the number of charts with poorly-written prescriptions.	No

5.2.6. Provision of Educational Services to Health Care Personnel in Secondary Care.

The services assessed here include the education of postgraduate pharmacists (particularly in clinical pharmacy), other pharmacy and non-pharmacy staff in secondary care.

Several documents have mentioned the role of the pharmacist in educating health professionals. Among the most specific that have been published in the UK were a Guild of Hospital Pharmacists paper[253], the report of a working party of the Royal Pharmaceutical Society that addressed competence assessment for continuing practice[254] and the Royal Pharmaceutical Society's national continuing education syllabus[255]. Continuing education is not yet mandatory for qualified pharmacists but, even in the late 1970s, many hospitals provided it[52]. The provision of education to aid the development of clinical pharmacy was reviewed in 1977[51]. The author considered the education that was available in the United States and in the UK and recommended the creation of residency periods and the use of practising clinical pharmacists as trainers in the UK. Others have provided similar overviews in 1982[256] and 1994[257]. In 1977, nine postgraduate courses were available in clinically-orientated pharmacy[51]. Reports of the development of formal postgraduate courses[258-262] and in-service training programs[263] were common in the 1970s and 1980s. More recently reports have emerged of the educational methods that have been used, such as tutored courses[264], videos[265], computers[266,267], and multimedia[268]. The roles played by regional[269-271] or in-house[272,273] courses, and by the College of Pharmacy Practice[274], in the education of pharmacy staff have also been described. The use of hospital pharmacists to educate doctors[228,275] and nurses[191] has been described. Doctors[137,139] and nurses[141,142], whose opinions were sought, were keen to involve pharmacists in their education.

5.2.6.1.   The evidence.

Two studies have shown that pharmacists' competence may be increased by education[264,270]. These studies were limited in their scope since they assessed only competence. Satisfaction with these and with other courses was high[265,266,273]. Pharmacists also have improved prescribing in a psychiatric unit by educating doctors[228]. This study took place at one hospital and the education was provided as part of a wider initiative to improve prescribing.

5.2.6.2.   Summary of evidence.

There is little or no evaluative evidence on the role of hospital pharmacists in directly educating other pharmacists or health professionals in hospitals. This may be due to their

limited involvement in the provision of formal education for some groups, such as doctors, but this argument would not hold for the provision of education to nurses, pharmacists and other pharmacy staff. The pharmacists' role in educating health professionals is expressed often in the routine ward and clinical services. The separation and evaluation of the educational role from the many other roles played by pharmacists in these settings is difficult and may also have hampered evaluations.

5.2.6.3. Suggestions for further research.

Much of the daily work of pharmacists results in the education of others in the hospital, such as doctors and nurses. Studies evaluating the pharmacist's role in educating non-pharmacy staff should assess the educative effect of ward pharmacy, advisory and information services, drug policies and audit, in addition to more formal educational activities. The reasons for the relative lack of involvement of pharmacists in the formal education of undergraduate and postgraduate doctors, and the potential benefits that such involvement would bring, should be explored. This research should assess the need for pharmacists' involvement in the education of those using drugs throughout the hospital, rather than confine itself to groups that have received education traditionally from pharmacy. This would be useful in determining future needs. The education that is provided for pharmacy staff needs to be assessed in terms of its value in improving patient and economic outcomes and not solely in terms of its effectiveness in increasing the competence of pharmacy staff. The assumption that all education is useful must be challenged so that pharmacists and others can discover the aspects of education that are truly useful in the provision of better patient care. In addition, there is a need to cost pharmacy educational activities fully and accurately and to explore the benefits of the many new technologies currently being advocated for use in pharmacy education.

Table 5.2.6.   Evaluative Studies on the Pharmacist's Role in the Provision of Education to Health Care Personnel in Secondary Care.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1989	Fitzpatrick RW[264]	Pharmacist education in kinetics	Prospective before/after competence assessment	Understanding of concepts increased by 96% and of equations by 157%. All found the course useful.	No
1992	Davies G & Dodds L[270]	Cascade training method	Prospective before/after limited competence assessment	Pharmacists' MCQ scores improved by a mean of 4.9 points (range -4 to +13) for one training module.	Yes (for that module)
1989	Taylor D[228]	Registrar induction training	Prospective time series survey of prescriptions	There was a reduction from 35% to 18% in the proportion of charts with variable dose/route and with no instructions.	No

5.2.7. Pharmacy Involvement in Research.

For the purposes of this thesis, pharmacy's involvement in research includes its contribution to the organisation and performance of clinical trials and to the conduct of pharmacy practice research on clinical pharmacy services. Pharmacists have become involved in research in other areas, such as on the formulation and stability of drug products, but this research is outside the scope of the present review.

Many documents and opinion statements advocate pharmacists' involvement in all aspects of clinical trials and describe the benefits of such involvement[276-278]; the most significant of these was The Way Forward[2-4]. The importance of pharmacy practice research was emphasised by the creation of the Pharmacy Practice Research Resource Centre funded by the Department of Health in 1991[279] and the Pharmaceutical Society's research strategy that was published in 1993[280]. Many opinion papers have been published on the subject of practice research[53,281-287] and schemes have been established to facilitate it (including the Enterprise Award scheme[285]), as have courses on research methods[287]. One survey examined the barriers to the performance of practice research[53].

5.2.7.1.   The evidence.

This chapter is a critique of pharmacists' efforts to evaluate the clinical pharmacy services that they provide. The natural progression of research can be seen in the results. The early anecdotal reports of services have given way to local studies trying to link service effectiveness with resource use. The progression of research seems to have halted at this point. There were few studies assessing needs, few generalisable studies on the economics or effectiveness of services, and little examination of the best methods of service provision. Many studies were small, single centre, poorly designed and poorly conducted. Often, they concentrated on promoting or protecting a particular service. Published studies often claimed that services had effected change but long-term follow-up data were provided rarely. There is widespread recognition in pharmacy circles that many studies were never published and hence there is a high risk of publication bias in the literature. Recent service development studies have tried to be more thorough in their approach to defining the need for a service[288] and have employed a variety of methods to assess service needs and efficiency[130,132-135]. In a few surveys, doctors supported the pharmacist's role in research[137,139]. Pharmacy's role in the conduct of clinical trials has not been evaluated, possibly because of the acceptance of their role in trial drug supply and record keeping.

5.2.7.2.   Summary of evidence.

No published studies evaluated the role of hospital pharmacists in research or clinical trials.

5.2.7.3.   Suggestions for further research.

Research into the pharmacist's contribution to the conduct of clinical trials needs to address the activities that pharmacists can undertake to make the process more effective. A starting point would be to assess the actual roles that have been assumed in this area before considering roles that have not been adopted and the barriers to such activities. Pharmacists have a role in guiding the development of protocols so that economic assessments are included in addition to clinical assessments. Practice research is slowly growing in the UK and has received the support of the Department of Health and other agencies. These initiatives and the publication of critiques of the pharmacy literature[289] will aid further developments by identifying gaps and flaws in the research that has been conducted. There is a need for pharmacy institutions to join forces with health service researchers from other disciplines, such as economists and other social scientists, educationalists, health professionals and managers, to design studies that will address current needs with well-planned and properly executed research. Since most services are now provided by multidisciplinary teams, there is a need also for research into methods of servcie evaluation that will permit the examination of pharmacists' contributions to patient outcomes.

5.2.8. Provision of Services directly to Patients.

Patient education and counselling, and the development of self-medication schemes, are considered here.

There is a perceived need for the provision of information and assistance to those on medication since adherence is known to be poor, there is a legal obligation to provide information, and it may improve patients' quality of life[290]. Hospital pharmacy associations have advocated roles for pharmacists in this area[291]. In addition, surveys have shown that patients on long term medication often know little about their medicines[291-300] or how to use administration devices[301], despite having received written information[293]. A study of changes in patients' medication revealed a need for the provision of information prior to discharge[302]. Reports have appeared of medication history-taking[224,227,229,230,303-309], self-medication[305,306,310-317] and counselling[224,229,230,238,298,301,302,305,309,311,312,315,318-326] services and the provision of written

information[229][230][?91,292][295,321,326-329]. A national survey of primary care patients found that information leaflets improved knowledge of therapy and satisfaction with information provision[330], and smaller studies showed that patients who received information on, or help with taking, medicines were satisfied with the service[291,292,295,300,318,326,327,329]. In many cases, patients have expressed a need for more information[292,294,296,297,300]. A few surveys show that doctors[137] think that pharmacists should be involved in patient counselling and medication history-taking but other survey results disagree[138,139]. Surveys of nurses' opinions do not support pharmacists' assumption of these roles[141,142]. In contrast, where nurses' opinions were sought on newly-provided services, all were positive[238,311,317]. The possibility of counselling being provided by pharmacy staff other than pharmacists[325], by the pharmaceutical industry[331,332] or by technological methods such as videos[333] or computers[70], have been considered rarely. The provision of information by the industry, principally in patient information leaflets (PILs), has been welcomed by some pharmacists but its usefulness remains to be assessed[331,332]. Although there are legal requirements governing PILs, it remains to be seen if the information contained in them is understandable to patients. In addition, the view has been expressed that the information on which material published by the pharmaceutical industry is based may be misleading[334].

It is important to differentiate between changes in knowledge, attitudes and practice. Increased knowledge does not automatically lead to a change in patient behaviour. Mazzuca[335], using the results of a meta analysis of 30 controlled trials of efforts to educate patients with chronic diseases, found that programs with a behavioural component were the most successful in increasing patients' knowledge and in improving compliance and outcome. He confirmed that the relationship between knowledge and compliance was tenuous. Raynor[336] reviewed the literature on efforts to improve compliance. He said that pharmacists can improve patient compliance by informing and educating them but that no particular intervention could be singled out as having been especially effective. He felt that the relatively high cost of providing many services, plus the present cost consciousness of the NHS, means that pharmacists will have to direct their efforts to developing cheap, effective programs that are generally applicable and acceptable to patients and the medical profession. Dr Raynor felt that effective verbal counselling improves knowledge but not necessarily compliance, hence future initiatives should combine verbal with written information that is easily understood. Certain compliance aids, such as reminder charts and aids, may improve compliance in sub-groups of patients. Dr Raynor suggested that the most effective strategy to improve compliance would be

to simplify regimens, to reduce the number of medicines being taken to four or less, and to reduce dosing to twice a day at most[336].

5.2.8.1. The evidence.

5.2.8.1.1. Patient counselling.

Sometimes, counselling was provided as part of a team service[238]. A mixture of counselling and initiatives such as written information were often used[318,319,326,337]. Several small studies have shown that verbal counselling improves compliance and knowledge immediately[301,323] and at various intervals afterwards[318,319,322,326,337]. One study compared the effects of counselling by a doctor, a nurse and a pharmacist. It found that doctors performed slightly better but that the counselling had no effect on the use of additional medicines at one week[322]. Pharmacist counselling alone was no more effective than nurse counselling in a large study[329]. Pharmacist counselling improved compliance, knowledge and outcome to a small extent in another study[337].

5.2.8.1.2. Information leaflets.

Raynor et al[329] found that a pharmacy generated medication reminder chart significantly improved patients' knowledge of their medications. The chart also improved their compliance with their regular drug regimen 10 days after discharge. Dodds demonstrated that information leaflets significantly improved behavioural scores, knowledge and compliance with antibiotic therapy at 3-5 days post-discharge[327]. A number of less well-performed studies also suggest that information leaflets alone[291,292], or in addition to verbal counselling[318], improve knowledge[291,292] and satisfaction with the information provided[318]. The studies failed to measure the effects on compliance and this cannot be assumed to improve with increased knowledge. Sandler et al[328] showed that a booklet was highly-regarded by general practitioners and patients and improved knowledge at a mean of 4 weeks post-discharge.

5.2.8.1.3. Medication history-taking.

Dodds[304] found that medication histories taken by pharmacists were more complete than those taken by junior doctors. A less well-performed study showed similar results[307]. The clinical significance of the service for patient care has not been assessed.

5.2.8.1.4. Self-medication schemes.

A number of descriptive studies suggest that self-medication schemes can improve patients'

comprehension of their therapy and facilitate self-care[109, 17]. A self medication scheme, jointly provided by pharmacists and nurses, improved short- and long-term compliance amongst elderly patients post-discharge[315].

5.2.8.2.   Summary of evidence.

Many studies of interventions that aimed to increase patients' knowledge of their therapy failed to measure changes in patients' medication-taking behaviour. This is a grave flaw since it cannot be assumed that behaviour will change as a result of increased knowledge. In addition, most studies of the effect of counselling on compliance were small, not generalisable, assessed compliance by tablet count, followed-up patients for a short time, did not consider economic factors and did not specify the nature of the counselling. Similar criticisms can be directed at studies of the education of patients using leaflets and other methods, and the effects of studies of self-medication schemes. Medication history-taking suffers from the same types of problems plus the added ones of significant potential for bias and little information on the contribution made by the service to patient outcome. There remains, however, a high acceptance that some efforts must be made to ensure that patients are well-informed about their medicines and are trained in their use. This is to optimise patients' abilities to benefit from their medicines by taking them correctly.

5.2.8.3.   Suggestions for further research.

Counselling, educational videos, interactive computer programs, compliance aids and self-medication schemes are all methods of enhancing patients' knowledge of medicines or their medication use skills. Research is needed to ascertain which methods are best at improving actual drug use (adherence and usage) and in what circumstances. There is also a need for economic studies of pharmacy services in this area. These evaluations should consider the effects of the use of non-pharmacists and of modern technology to educate and train patients or their carers. The contribution that pharmacist medication history-taking makes to patient care needs fundamental assessment.

Table 5.2.8.   Evaluative Studies on the Pharmacist's Role in provision of Services directly to Patients.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1990	Baker D[318]	Patient information leaflets & counselling	Prospective randomised controlled trial	Information leaflets plus verbal counselling increased patients' understanding of therapy and their satisfaction with information given.	No
1977	MacDonald ET et al[319]	Counselling and dosage aids	Prospective time series studies	Verbal counselling increased patients' knowledge and reduced medication errors 12 weeks after discharge.	No
1982	Dodds LJ[304]	Medication history taking	Prospective comparison over 2 months	Medication histories taken by a pharmacist were more complete and detected more adverse drug reactions than those taken by junior doctors.	No
1984	Edwards M & Pathy MSJ[322]	Discharge counselling	Prospective randomised controlled trial	Counselling significantly improved compliance, recall and understanding but not use of additional medicines. Patients counselled by doctors complied better than those counselled by pharmacists or nurses.	No
1986	Dodds LJ[327]	Patient information leaflets (antibiotics)	Prospective randomised controlled trial	Patients found information leaflets useful and necessary; knowledge, compliance and behaviour were improved significantly.	No
1986	Johnston M at al[323]	Discharge counselling	Prospective randomised controlled trial	Counselling significantly improved patients' knowledge at discharge.	No
1989	Sandler DA et al[328]	Discharge information booklet	Prospective randomised controlled trial	GPs and patients were satisfied with a booklet that significantly improved knowledge at first outpatient visit.	No
1987	Kay EA et al[291]	Patient information leaflet	Prospective before/after survey	Knowledge of therapy significantly improved one week after leaflet given	No

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Table 5.2.8. continued.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1989	Sweeney SJ et al[326]	Discharge counselling (+ written information as appropriate)	Prospective controlled evaluation	Counselling doubled compliance at 6-7 weeks and reduced significant non-compliance by 80%.	No
1991	Sexton JA[317]	Self-medication scheme	Prospective before/after evaluation	Improved patients' comprehension. Well received by nursing staff.	No
1992	Wood SI et al[315]	Self-medication scheme	Prospective controlled evaluation	Compliance significantly improved at 2 weeks and 3 months.	No
1993	Raynor DK et al[329]	Computer-generated patient information	Prospective randomised controlled trial	Information leaflets significantly improved knowledge and compliance at 10 days post-discharge.	No
1988	Punchak SS & Kay EA[292]	Patient information leaflet	Prospective before/after study	Knowledge of therapy significantly improved one week after leaflet given	No
1987	Evans TC[238]	Patient counselling	Prospective controlled time series study	Anxiety and sleep scores improved and information on therapy and feelings of well-being significantly improved.	No
1988	Horsley MG & Bailie GR[301]	Patient counselling	Prospective before/after study	Technique improved significantly immediately after counselling.	No
1992	Goodyer L[337]	Patient counselling	Prospective controlled trial	Counselling improved knowledge, compliance and outcome. Improved outcome was not associated with improved compliance.	No

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5.2.9. Quality Improvement Activities.

Many services covered in other sections of this chapter contribute to the quality of care. Here, those services that are primarily concerned with quality improvement, such as audit, and services that are concerned with the detection of poor quality outcomes, such as adverse events monitoring, are addressed.

Evidence exists in the UK[338] and elsewhere[339,340] that the quality of hospital care may be substandard with serious consequences for society and individual patients. A meta analysis that was carried out in 1992 found that, in industrialised countries, an estimated 5% of hospitalisations were due to adverse drug reactions (ADRs)[341]. ADRs leading to[342,343], and occurring in the course of[343,344], hospital admissions have been studied in the UK. Under-reporting of ADRs is widely acknowledged as a problem despite the creation of the Committee of Safety of Drugs in 1963. This committee, which was succeeded by the Committee of Safety of Medicines (CSM) in 1971, instituted the world's first adverse drug reaction reporting scheme in 1964[345,346]. The scheme is a confidential one that doctors and dentists can use to register ADRs. Pharmacists have become more involved in ADR detection and reporting over the years[54,346-355] although they have not yet been allowed to complete yellow cards independently for the CSM[356-358]. The Grahame-Smith working party recommended that health authorities should encourage pharmacists to participate in ADR work in hospitals[358]. A trial, in which pharmacists can report ADRs directly to the CSM using yellow cards, has recently started[359]. Doctors' support for pharmacists' involvement in ADR detection and reporting has been high in some surveys[137,360] but only moderate in others[138,139]. The surveys did not ask about doctors' views on pharmacists reporting ADRs to the CSM, a role that some clinical pharmacologists favour[357]. Nurses' views on pharmacists' participation in ADR reporting were less positive[142].

The government's policy on multidisciplinary clinical audit[361] has stimulated interest in this area. A plethora of opinion papers[362,363] and reports on the performance of audit in the UK[364-366] have been published. In addition, there has been a working party report on the topic from the Royal Pharmaceutical Society of Great Britain[367]. Several studies describe pharmacy's efforts to ensure the provision of a high quality service to their customers[368], to improve pharmacy processes[369-372], to assure the quality of clinical pharmacy services[133,134,373,374] and to increase pharmacy involvement in multidisciplinary audit[375-377]. A survey of doctors' and pharmacists' attitudes to pharmacist involvement in medical audit in hospitals revealed that

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doctors were in favour of this but pharmacists had more negative attitudes[378].

5.2.9.1.   The evidence.

Several poorly controlled studies show that ADR reports increase following the institution of a system that involves pharmacists in reporting[355,379,380], although a system that merely highlighted drugs under surveillance had no effect[353]. One descriptive study showed that, in the short term, increasing awareness increased reporting[354]. Others, which examined ADR detection methods, indicated that the prescription monitoring service could contribute to ADR detection[343,381,382].

Pharmacists may, by contributing to the audit process, improve the process of care[155,178,180,383,384]. These studies were small and some were poorly-conducted although, in some cases, the results would have been generalisable. One study used an attitudinal questionnaire to discover if education would improve attitudes to the audit process[385]. Although the results were positive, the researchers used a questionnaire that had not been validated.

5.2.9.2.   Summary of evidence.

Studies on pharmacy participation in ADR reporting schemes were poorly controlled, open to bias and confounding, and counted ADRs rather than demonstrated the effect on patient care or on the process of care. The costs of providing these services were not assessed and the results are not generalisable. The results suggest, but do not prove, the effectiveness of pharmacy services in this area. The few evaluative studies of pharmacists' contribution to audit were poorly conducted but this may be a problem with audit assessment in general rather than a pharmacy-specific problem.

5.2.9.3.   Suggestions for further research.

Many pharmacy services may contribute to quality improvement. There is a need to cost the provision of such services and to link their effects to changes in patient and economic outcomes. Some research, such as that on the conduct of audit, may be very difficult to perform since the research may interfere with the process under study. Quality assurance of some pharmacy services can be performed by pharmacy in isolation but much research will need to include the other health care professionals involved in the drug use process.

Table 5.2.9. Evaluative Studies on the Pharmacist's Role in Quality Improvement Activities.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1985	Bussey RA and Martin AM[379]	Adverse drug reaction reporting	Uncontrolled before/after study	The scheme increased the number of reports made from 2 per annum to 44.	No
1987	Irvin LE et al[380]	Adverse drug reaction reporting	Uncontrolled before/after study	Scheme increased the reports made from 18/1000 beds to 74/1000 beds but the proportion reported to the CSM fell from 93% to 69%.	No
1992	Smith D[353]	Adverse drug reaction reporting	Uncontrolled before/after study	The scheme had little impact on ADR reporting.	No
1992	Richardson J and Gibbs C[354]	Adverse drug reaction reporting	Uncontrolled before/after study	The scheme increased the monthly ADR reports rate from 4 to 12.	No
1990	Robb J et al[383]	Contribution to clinical audit	Uncontrolled time series study	Pharmacists' involvement in audit led to improvements in the use of diabetic blood glucose monitoring.	Yes
1993	Cavell GF and Taylor KA[384]	Performance of pharmacy audit	Partially-controlled time series study	Audit of prescription monitoring improved its performance.	Yes
1992	Eadon H[155]	Ward pharmacy	Prospective survey and assessment	53% of 1315 interventions led to improved care and 2% prevented major problems.	No
1992	Goodyer LI et al[178]	Prescribing policy audit	Prospective time series evaluation	Compliance with the policy increased.	No
1991	Morgan DJR et al[180]	Prescribing policy audit	Retrospective audit of prescribing	100% compliance with the policy. Potential savings were estimated at £27,000.	No

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5.2.10. Specialist Services.

This section considers intravenous additive (IVA), therapeutic drug monitoring (TDM), anticoagulation control and residency services.

The provision of IVAs by pharmacy was recommended by the Department of Health in 1976[190]. Where IVAs are provided, they are frequently manufactured, centrally, in the pharmacy department although there are moves to decentralise this service[386]. There is evidence that IVAs increasingly are being provided centrally in UK hospitals[387-389] where their provision is appreciated by other health care staff[387,388,390]. Nurses[141] and doctors[139] have indicated, in surveys, that they think the provision of IVAs is a pharmacy role.

Residency services have been described[55,391,392] and the need for an out-of-hours service has been assessed in individual hospitals[55,392-394].

The, mainly North American, literature that explores the relationship between the maintenance of levels in the therapeutic range for drugs with narrow therapeutic indices and patient care will not be covered. Several UK articles described the provision of TDM services[395-397]. Other studies have assessed the usefulness of TDM services[398,399] and assessed the problems experienced in providing such as service, such as problems in obtaining corrects requests for TDM and the interpretation of, and assurance of action on, serum level reports in the absence of active pharmacy involvement[400-406]. Some surveys have shown that doctors think that pharmacists should be involved in providing TDM[137-139], but others were less positive[398,407]. Pharmacists have advocated that a pharmacy-run TDM service should be provided to overcome what pharmacists perceived as deficiencies in the current system[399,407-409]. Even where a pharmacy service was provided, active pharmacy intervention may be necessary to ensure that the misuse of the service is minimised[405].

Anticoagulant therapy has been shown to be poorly controlled[410,411] and clinics run jointly with doctors[412] or by pharmacy alone[63,413,414] have been described.

5.2.10.1. The evidence.

5.2.10.1.1. Central intravenous additives (CIVAs).

Descriptive studies have claimed that the provision of cytotoxic[415,416] and other parenteral therapy[417] by pharmacy from a central facility can save money and reduce risks to patients and

staff. Two partial evaluations suggested that a CIVA service would improve the quality of intravenous drug administration but neither fully costed the service[418,419]. The better evaluation[419] showed that the quality of service was higher for the CIVAs and that the labour costs were lower but the use of minibags made the CIVA service more expensive than the traditional nurse-reconstitution service.

5.2.10.1.2. Therapeutic drug monitoring (TDM).

A number of uncontrolled studies suggest that a pharmacy-run TDM service increases the proportion of patients whose drug levels are in the therapeutic range[420-422]. A small controlled study provided more convincing evidence of this for theophylline[423]. A well performed study indicated that maintenance of theophylline levels within the therapeutic range improved patient outcome[424]. This, however, was not a study of pharmacy services.

5.2.10.1.3. Anticoagulation control service.

A retrospective study showed that measures of anticoagulation therapy processes (interval between visits), outputs (degree of fluctuation in levels between visits and proportion of levels in the therapeutic range) and outcomes (incidence of side effects) were similar for joint pharmacy-doctor clinics and doctor-only clinics[413]. A less-well performed study showed similar results[63].

5.2.10.1.4. Residency service.

No evaluations were found although one study provided cost and workload figures[392].

5.2.10.2. Summary of evidence.

CIVA services have not been properly evaluated. The two evaluations that have been carried out ignored capital investment costs and the value of increasing the quality of the service. Even the better of the two studies on CIVAs lacked several components of a sound economic evaluation and did not link service quality to improved patient care. The results of the studies were not generalisable. Few TDM service evaluations have been published. Those that have demonstrated that the service improves service outputs. Only one linked outputs to changes in outcome and this was a university based study. Few studies were controlled, many were potentially biased and none were economic evaluations or generalisable. Anticoagulation services have been evaluated to a limited extent. The results show that pharmacists perform at least as well as doctors in terms of service process, output and outcome, but the results are

not generalisable and no economic evaluations have been performed. Residency services have not been evaluated.

5.2.10.3.   Suggestions for further research.

CIVA services need to be fully evaluated economically and in terms of patient care. Studies should include comparisons with the services provided by commercial enterprises. The provision of pharmacy services when the pharmacy is closed needs examination. This should include an assessment of technological and organisational interventions to provide services that satisfy patient care needs, rather than simply evaluating residency services. Pharmacy involvement in providing TDM services needs further evaluation, particularly to explore the value of various methods for pharmacy to input into the care process, the implications of phamracy's input for service efficiency and the effect of such servcies on patient and economic outcomes. Pharmacists' participation in anticoagulation control has been evaluated to a limited extent. Further work is necessary to evaluate the economic benefits of the service, using multi-centre studies, and to explore the full range of benefits of pharmacist participation in this service.

Table 5.2.10. Evaluative Studies on the Pharmacist's Role in the provision of Specialist Services.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1990	Wilson M[419]	Central intravenous additives	Prospective uncontrolled study of costs and quality indicators	Use of CIVAs improved service quality and saved nursing time but was more expensive overall.	No
1985	Fitzpatrick RW & Moss-Barclay C[423]	Therapeutic drug monitoring (theophylline)	Randomised controlled trial	The service increased the proportion of patients whose levels were in the therapeutic range.	No
1985	Pegg M et al[413]	Anticoagulation control	Retrospective controlled study	Joint pharmacist-doctor outpatient clinics performed as well as clinics run solely by doctors on service process, output and outcome.	No
1987	Parekh R and Ghee C[63]	Anticoagulation control	Retrospective controlled study	A pharmacy-run anticoagulant clinic maintained levels in the therapeutic range to a similar extent to doctor-only clinics but may be more expensive.	No

5.2.11.   Provision of Clinical Pharmacy Services to Primary Care Recipients.

This section concentrates on services provided by hospital (including community services) pharmacists to primary care staff and patients. It is recognised that other sections of this chapter contain services that could also be included here. For brevity, only those that are considered to be directly relevant are cited. These are descriptive studies that depicted the implementation of joint hospital-primary care prescribing policies[166,168,169,183], the provision of drug information[207,213,214] or information on patients' therapy to primary care professionals[328], the provision of patient counselling and education[70,224,229-30,293,295,298,319-20,322,326,328,333], the provision of drug therapy review[227,229,230], the participation in multidisciplinary care services[238,239] and the provision of education for community pharmacists[385].

Several studies describe specific programs set up by hospital pharmacists, acting as part of a multidisciplinary team, to facilitate the care of patients taking complex medication regimens at home[425,426]. There are also descriptive studies of the role of the community services pharmacist in facilitating the development of the role of community pharmacists in nursing and residential homes[427,428] and in moving patients to the community[429]. A number of opinion papers provided views on the role of the community services pharmacist before[430] and following the NHS changes[431-433]. Deficiencies in the current system of moving patients between primary and secondary care are thought to be detrimental to their care[434]. This has led to efforts to improve the quality of care for these patients[435,436] and to improve communication between practitioners in the different care sectors[437-440]. A number of studies show that savings can be made if hospital pharmacies become involved in supplying patients in primary care with various, difficult to obtain, medications[441] or if pharmacists create schemes that facilitate the re-use of patients own medications that they have brought into hospital[442-444].

5.2.11.1.   The evidence.

A few studies on the provision of services to patients[238,319,322,328,326] or to general practitioners[328] were evaluations. One study showed that pharmacists' input into the care of oncology patients in primary care improved their well-being and knowledge of treatment[238]. Involvement in patient education prior to discharge improved knowledge[328] or compliance[319,322,326] at varying lengths after discharge. The details of these studies are provided in Table 5.2.8. An additional study, listed in Table 5.2.11 below, showed that savings could be made if hospital pharmacists co-ordinated continuous ambulatory peritoneal dialysis (CAPD) fluid supply for patients in primary care who were undergoing dialysis[441]. It failed, however, to measure all the costs and

consequences and, except for satisfaction, ignored patient care outcomes.

5.2.11.2. Summary of evidence.

One study showed that savings can be made by hospital pharmacy involvement in the provision of medications to primary care but it was not a full economic evaluation. Studies on patient counselling and education have been covered in Section 5.2.8. Many were small, not generalisable, assessed compliance by tablet count, followed-up patients for an insufficient period and did not consider economic factors. Studies on the re-use of patients' medicines were descriptive and did not evaluate the service.

5.2.11.3. Suggestions for further research.

Changes in responsibilities for patients in the community, particularly for those in institutional or care settings, and the demise of district pharmaceutical officer posts, has increased the need for appropriately trained pharmacists to provide advice on the pharmaceutical care of patients in institutions in the community sector and in their own homes. Where necessary, these pharmacists should provide services directly to these patients. There is a need for descriptive studies to explore and quantify these needs and to suggest how pharmacists may best meet them. This descriptive research should precede any evaluative studies that compare the effectiveness of various methods of meeting need. Full economic and effectiveness studies should be performed of services that seek to utilise patients' own medicines in hospital, to improve patients' therapy in institutional care and at home, and to provide complex therapies for patients in their homes. The implications of these services for the entire health service, rather than a single health sector, needs consideration.

Table 5.2.11. Evaluative Studies on the Pharmacist's Role in the provision of services to Recipients in Primary Care.

Year	Author(s)	Service	Design	Result (Size of effect)	Generalisability
1990	Mawhinney WM et al[441]	Continuous ambulatory peritoneal dialysis fluid supply service	Prospective before/after study	The service saved £36,000 net in the first year. Patients and health professionals were more satisfied with the service than with the previous non-pharmacy service.	No

5.3. Difficulties Associated with the Evaluation of Clinical Pharmacy Services.

The major difficulty in evaluating clinical pharmacy services stems from problems in linking the effects of these services to economic and, more particularly, to patient outcomes. The multidisciplinary nature of health care means that the pharmacist's contribution is but one part of the total patient care package provided by health professionals, hence it is difficult to separate pharmacy's contribution to a change in patient outcome from that of the doctor and anyone else involved. The failure of pharmacy to record its input into patient care in the medical notes further complicates this issue[445]. For economic outcomes, a similar problem pertains since decisions regarding the use of medicines are not solely the province of the pharmacist. Several factors may influence the choice and use of drugs, such as patient factors, doctors' preferences, hospital policies and pharmacists' advice. Many of these factors are outside the direct control of the pharmacy. Even if decisions affecting therapy were under pharmacy's control, service evaluation could remain problematic due to difficulties in attributing changes in outcome to particular clinical pharmacy services given that patients often receive more than one clinical pharmacy service at a time for one or several problems.

Although outcome evaluation is viewed as the ultimate gauge of the effectiveness of a service, difficulties in its measurement mean that process measurement is often used as a proxy for outcome measurement. Some outcomes, such as mortality and expenditure on drugs, are relatively easily assessed; others, such as changes in health status, are not. Economic inputs and outputs are measurable but their measurement and apportionment may present problems in practice. This may result from absence, incompleteness or unreliability of data on *all* costs and consequences, direct, indirect and external, difficulties in apportioning costs and consequences to specific clinical pharmacy services, and problems in the valuation of non-monetary costs and consequences. Hence many studies did not include, or accurately measure, all the monetary costs and consequences associated with a particular clinical pharmacy service and few confronted the issues of non-monetary costs and consequences. There are significant difficulties in measuring patient outcomes that are not so easily quantified as death because of the relative lack of well-validated, but user-friendly, tools for the measurement of changes in health status and quality of life and the relatively high cost of obtaining such data. Outcomes may be delayed, or occur at an unpredictable time, making their detection and measurement costly and laborious. Adverse drug reactions, for example, occur so infrequently as to make changes in their rates of occurrence insensitive indicators of the effects of clinical pharmacy services. The outcomes of some services, such as patient education, may be difficult, and

possibly expensive, to detect and quantify. If services are provided to health professionals, such as education, drug and financial information, it may be difficult to measure outcomes due to the reliance on recipients' valuations of benefit. Such valuations may be biased since "professionals tend to underestimate the contribution of other professionals"[92]. Frequently, it is necessary to use professionals' and patients' opinions of the value of clinical pharmacy services rather than more objective measures. The limitations of such evaluations may preclude reliance on their conclusions.

The factors described above help explain the use of process and output, rather than outcome, measures in the evaluation of clinical pharmacy services. Since process and output variables are usually attributable to particular clinical services, they offer potential for service evaluation. Such evaluations cannot be relied upon, however, unless a link can be established between changes in process and output variables and a corresponding change in outcome variables. Process variables that quantify clinical pharmacy services are commonly used in clinical pharmacy evaluations but those indicative of quality are less frequently used and, when they are, they are often not validated. Prescriber acceptance of pharmacists' recommendations, for example, is commonly used as a quality indicator although its validity is unproven and it is subject to many influences. In addition, clinical pharmacy service processes are diverse, frequently ill-defined and sometimes difficult to measure. The lack of sensitive, specific and objective measurement tools is compounded by a lack of criteria and standards for the performance of the processes involved resulting in a paucity of well-performed evaluative studies of clinical pharmacy services.

Finally, and most importantly, the shortage of evaluative studies in clinical pharmacy reflects its ad hoc development in the UK and the failure of managers to fully and objectively assess new services. The need to decrease errors in medication ordering, supply and administration stimulated the development of ward pharmacy; in many cases, clinical pharmacy services appear to have evolved from the ward pharmacy service without any prior evaluation of their contribution to health care. It is likely that the evaluation of services may not have become a concern until the 1980s when the health care environment became cost conscious. By then, however, many services were established making their evaluation difficult from a practical perspective. Furthermore, managers may have sought to protect the services thereby giving rise to the mass of poorly-performed single site studies.

5.4. Limitation of the Literature Assessment.

The literature was located using electronic and manual searching methods and follow-up of references. Although every effort was made to identify all relevant literature, including "grey" literature, and, where necessary, to follow up important studies with the authors, the emphasis was on published literature. This may have resulted in the introduction of bias since the literature assessed may not be a true representation of all the research evidence on UK clinical pharmacy services.

In addition, the criteria on which individual studies were judged were exacting. This was considered the best approach, in the interests of establishing research needs for the profession, but it has some disadvantages. It has passed a harsh judgement on the efforts of pharmacy practice researchers and may discourage further research. For the most part, practice research studies have been performed to assess the feasibility of new services or to justify the funding of a new or established service. Evaluative studies have been few and far between. It is recognised, however, that most pharmacy practice research to date has been carried out by well-intentioned hospital pharmacists who may have been inadequately trained in research methods and unsupported in their endeavours. It is hoped that the review that is presented in this chapter will stimulate the appropriate performance of pertinent research rather than deter future researchers.

5.5. Summary - Future Research Initiatives.

Eleven different categories of pharmacy service have been considered in this chapter. The main conclusions that can be drawn are that few evaluations have been carried out on these services and, where they have, they have been limited in scope (concentrating mainly on short-term process and output variables), subject to potential bias and confounding and have produced results that are not generalisable. No sound economic studies have been performed and studies on secondary outcome were very rare. Assessments of need were performed in some cases but the aim seems to have been to show a need for a pharmacy service rather than to assess true need in an open-minded manner.

Assessments of need are required in some areas, particularly in the information, education and interface service areas. In other areas, there is a need to consider the best method of meeting known needs. Technological advances and skill mix should be considered as we l as the

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services of professionals such as pharmacists.

There is a need for full evaluations of all the services. There may be problems carrying out studies where services have been established for several years and non-experimental designs may have to be employed in these cases. Where possible, evaluations should consider economic and patient outcomes, be multicentre studies that guard against confounding and bias, and take a broader view of potential costs and consequences of services. Some evaluations must, due to difficulties in separating pharmacists' contributions from those of other professionals, be of a multidisciplinary team service. This may be threatening to pharmacists in the current economic climate.

Particularly for services at the interface and those provided directly to patients, but also for other services, there is a need to examine the organisation and delivery of services and to evaluate various methods of their provision to ascertain which is the most efficient. This work may be threatening for pharmacists also.

Service evaluation must not be a one-off event. There is a need for the application of processes that consider the quality of services on an ongoing basis. Audit and quality improvement services are required to assure the quality of services provided within the pharmacy department and of those provided to customers in secondary and primary care. Ideally, these should follow on from, rather than precede, evaluations of the effectiveness of the services in question.

CHAPTER VI

PHARMACISTS' AND OTHERS' PERCEPTIONS OF THE CLINICAL ROLE OF THE HOSPITAL PHARMACIST IN THE UNITED KINGDOM NATIONAL HEALTH SERVICE

6.1. Introduction.

Interviews, usually lasting 45 minutes (range 30-120 minutes), took place with 129 people, including doctors, nurses, pharmacists, managers and pharmacy technicians (Table 6.1), at eight NHS hospitals. The sites were selected to encompass as wide a range as possible of the characteristics found to be important in the questionnaire survey and other relevant characteristics (Table 6.2). In the following sections the types of pharmacy service that were encountered are depicted. This is followed by a description of the clinical roles envisaged for hospital pharmacists in the UK NHS, the extent of agreement on these roles and the specific barriers and facilitators to their adoption.

6.2. Views on the Types of Clinically-Orientated Pharmacy Services.

Many pharmacists did not view the service as a unified entity. Some services, including dispensing and supply, were considered essential. Others, such as clinical pharmacy and quality control, were considered by some to be less essential. This division was more pronounced in large departments where clinical pharmacy specialists often behaved as if their area was the only one of real importance. In smaller sites this was not an issue since pharmacists combined several functions during their working day. Pharmacy managers sought to emphasis the interdependence of all pharmacy services but this had permeated throughout the pharmacy workforce in only a number of cases. Pharmacy managers, and some pharmacists in non-managerial roles, were anxious to maintain a model of integrated pharmacy services to reduce the vulnerability of clinical pharmacy in an internal market.

"I think it's important to show how interdependent pharmacy is so they (directorates) can't pick up dispensing but not clinical pharmacy. One can't work without the other" (Unit Pharmacy Manager).

6.2.1. Ward and Clinical Pharmacy.

At some sites, typically where clinical pharmacy was most developed, clinical and ward pharmacy were seen as distinct entities. In these sites ward pharmacy was seen as a mechanistic process to assure safety whilst clinical pharmacy extended to include the optimisation of patient therapy to improve the quality of care and cost-effectiveness. This differentiation created two types of pharmacists with only clinical pharmacists feeling a duty to provide patient-orientated services.

"To my mind, ward pharmacy is a means to an end. Ward pharmacy is a fairly basic mechanistic process. Clinical pharmacy is the real quality side of it in terms of care of patients. It improves the patients' well-being. " (District Pharmaceutical Officer).

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Table 6.1.   Numbers and categories of hospital workers interviewed.

Hospital	Number of interviewees in each group											
	Hospital manager	Pharmacy manager	Specialist pharmacist	Generalist pharmacist	Pharmacy technician	Pharmacy secretary	Clinical director[1]	Clinical services manager	Consultant[2]	Training grade doctor	Nurse	Total (sites)
1	0	4	2	3	0	0	1	0	2	2	2	16[3]
2	1	3	3	1	0	0	1	0	2	2	2	15
3	2	2	1	1	0	0	1	0	1	2	2	12
4	0	3	5	1	0	1	3	2	0[1]	2	3	20[4]
5	0	2	3	1	2	0	1	1	1	2	2	15
6	1	2	5	2	1	0	0	0	2	3	2	18[5]
7	1	2	4	1	1	0	2	3	1	2	1	18[6]
8	1	1	3	3	1	0	1	1	1	1	2	15
Total (groups)	6	19	26	13	5	1	10	7	10	16	16	129

Notes to Table 6.1:
1.   All clinical directors were consultants;
2.   Consultants who were not clinical directors;
3.   Additional material was obtained at a meeting of six ward pharmacists;
4.   Additional material was obtained during informal chats with a group of four pharmacy technicians and a group of three pharmacists and two technicians;
5.   Additional material was obtained at a formal meeting of clinical and technical services pharmacists;
6.   Additional material was obtained during an informal chat with five clinical and ward pharmacists.

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Table 6.2. Characteristics of the eight United Kingdom National Health Service hospitals used as interview sites.

Hospital	Characteristic							
	Teaching hospital	More than 10 pharmacists	Clinical pharmacy specialists	Pharmacists with higher qualifications	Part of UK NHS	State of development of clinical pharmacy	Accepted leader in the field	Subjected to radical change
1	✓	✓	✓	✓	London[1]	Moderate		
2	✓	✓	✓	✓	England	High	✓	
3					N Ireland	Low		
4	✓	✓	✓	✓	England	Moderate		✓
5	✓		✓	✓	SHA[2]	Moderate		
6		✓		✓	England	High	✓	
7	✓	✓	✓	✓	Scotland	Moderate		
8				✓	London[3]	Low		

Notes to Table 6.2:
1. Central London;
2. Special Health Authority;
3. Outer London.

6.2.2. Directorate Pharmacy Services.

Services were provided to clinical directorates at six sites. Although the detailed arrangements varied, the distinguishing factor was that a named pharmacist provided services to a clinical directorate. These services usually included the provision of financial information in addition to the provision of clinical pharmacy. Directorate services co-existed with the traditional ward pharmacy service in several hospitals. Formal contracts with clinical directorates were in place at one site with directorates paying pharmacy for services. Shadow contracts were in operation at two other sites without direct payment. At the remaining sites there were no formal agreements with directorates. Non-contracted and contracted directorate services will be addressed separately here.

6.2.2.1. Non-contracted directorate pharmacy services.

In this case, where there were no contracts, pharmacy had decided to provide directorate services to high cost directorates but had not created service agreements. Most pharmacy managers felt uneasy about directorate services because they felt they could result in a directorate-led, contracted, pharmacy service where directorates could decide if they wanted to purchase a pharmacy service and what type of service this would be. They feared that directorates would not perceive the service to be giving value for money. As a result, some were trying to increase the efficiency of services and to communicate the value of services to managers and clinical directorates.

Pharmacists and others felt that relationships with directorates could cause conflicts of loyalty for directorate pharmacists and impede service provision, especially if directorates were to employ pharmacists directly, although this had not yet happened.

"The new directorates are a worry because clinical pharmacists will be employed by them eventually, I think, and who are they answerable to?" (District Pharmaceutical Officer)

There was the fear also that the entire pharmacy service would become accountable to doctors.

"I suspect that I'll be accountable to the unit physician. It's frightening." (Chief Pharmacist)

Differences between the service provided to directorates required pharmacy managers to select and allocate staff appropriately. Some pharmacists felt that some services, which were provided across the entire hospital, were vulnerable to the tendency to fragmentation arising from the directorate system. Such services included DUR (drug utilisation review), pharmacy staff education and DI (drug information). Where clinical directors or their managers were unclear about, or disinterested in, pharmacy services, pharmacy could define the service provided. This could, however, make it difficult for directorate pharmacists to provide an

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appropriate service and to implement change, for example introducing prescribing policies.

Directorates were seen by pharmacists as providing tremendous opportunities for pharmacy service development since they were more focused on costs, had their own budgets and could make decisions independently of central hospital management.

"We are going to have contracts for an integrated service. It will stop creeping developments. It will give a baseline across the hospital and identify the service that different wards are getting. Based on what's happening now they can see a ward pharmacy service and can request it" (Unit Pharmacy Manager).

Directorates also facilitated the more appropriate use of pharmacists' skills and their integration into teams. They stimulated pharmacy to provide a more patient and customer-orientated service.

Those in clinical directorates saw many opportunities arising from the new system. They wanted pharmacy to provide more information on drug costs and on the factors that affect drug expenditure, to provide assistance with the control of drug expenditure, to participate in ward teams, to increase the cost-effective use of medicines and to improve the quality of patient care. Pharmacy activities that had increased were involvement in policy creation, therapeutic advice, central intravenous additives (CIVAs) and audit. Directorates felt that they were getting value for money. Even where directorates did not yet exist, some doctors and other staff indicated that they would pay for pharmacy advisory services.

"Her cost is about 10% of the drug budget. We will include her cost in the charge we make for treating patients at the hospital if it comes to that. It has to be costed very carefully into the total patient bill. But I think paying £20,000 for a pharmacist is worthwhile. Our drug budget is over £200K pa." (Consultant)

6.2.2.2. Contracted directorate pharmacy services.

At the site with contracted clinical pharmacy services, pharmacy managers negotiated contracts and managed pharmacy staff and services within these contracts and the resources available. The acquisition of managerial, marketing and negotiation skills helped pharmacists cope with these greater demands. Pharmacy managers took pharmacy priorities for service development, their perceptions of directorates' needs, and pharmacy staff and resources into account, in addition to the directorates' wishes, in negotiating the contracts. If services fell short of the contract then pharmacy might have to refund money to directorates. Contracts were organised within a certain time span with some flexibility being required to facilitate recruitment. Leave was strictly regulated to ensure adequate staffing and longer contracts were

favoured to decrease the transaction costs. Pharmacy managers retained managerial control over pharmacy staff and services because differences in contracts meant that several levels of pharmacy services were provided and pharmacy managers had to match pharmacists' abilities to the skill level required for the service. This helped to ensure job satisfaction and to avoid the stress of enforced under-performance. Ward pharmacy (non-contracted) was provided by pharmacists in junior grades (A or B grades) and clinical pharmacy (contracted) by more senior pharmacists (those at C grade or higher). Pharmacy managers at this site had successfully addressed issues of conflicts of loyalty.

"The other potential problem is that the directorate pharmacists can have conflicting loyalties and that can be a problem. They may identify overmuch with the directorates at the expense of the department. So we discuss this openly like the time we had the question about the costs of the TPN (total parenteral nutrition) service. That was a problem for some of the directorate pharmacists. So it came up in a business meeting and I explained how I calculated the on-cost (costs in addition to those of materials) to them very clearly. " (Chief Pharmacist)

The clinical directors at this site were also aware of the potential for conflicts of loyalty.

"Conflict can happen. Well, a, they could see themselves out of a job. Number two, who is the boss? They might see a way of reducing the cost that changes pharmacy not just ward costs. That could be a big problem. But, if it happens, then they will have to be open about it. If you get into conflict it's not good. You don't get anywhere. You get around it ... but you have to recognise it could be a problem. " (Clinical Director)

Overall, the general attitude in pharmacy to working within directorates was positive. Pharmacists felt that they had proof of service acceptability and of the effects of the service on economic and care factors. Their managers felt that it allowed pharmacy to prove its contribution to the provision of health care.

"I'm very optimistic. It's a great time to be in hospital pharmacy. It's a basic philosophy and I've been a hospital pharmacist all my life. I see it as a wonderful opportunity. I think that it's the best news of all for pharmacy, all theses changes. Pharmacy was a stagnant profession before. Now it's changing every day. You might as well face this constant change. I'm glad it's happened. We'd never have been able to do the things we've done without the changes. It's a chance for pharmacy to develop it's full potential. They need us very much, more than ever before, in many more ways. " (Chief Pharmacist)

Staff were under some pressure but were confident of their skills and contribution, were patient and customer orientated, and enjoyed excellent interprofessional relationships.

"Patients get a better quality pharmacy service. The dose is tailored for their needs. You check their renal function and their liver function. You bother to do something about it when the patient is just a bit constipated, things that seem minor to medics. You bother to get medicines to patients fast like TTOs (To Take Out), you don't say no the dispensary can't do it. You're better at using your skills. " (Specialist Pharmacist)

Junior pharmacists were sometimes disturbed by contracts that required them to perform to a

defined standard. Senior pharmacy managers recognised that short term contract were undesirable because they hamper staff recruitment, training and allocation and because pharmacists need about a year to show an effect on budgets, and short contracts. Pharmacy managers realised the importance of marketing their service.

"The whole question is "is it the CSM (clinical services manager) *or the CSD* (clinical director) *or another person who has the power? The first time around we targeted the CSM because they were amenable. That was a big mistake to market to only one of them. You have to know what's going on at the contract level. It's very important to speak to the decision influencers like the nurses and the consultants. In the first round we targeted the CSMs. In one directorate the manager was fairly assertive. We had a contract for one year by April. By June she had left to go to another hospital. The new CSM was in post by October. We had only targeted the CSM. When she left there was a gap. If she had stayed in place we'd have a contract now. "* (Clinical Pharmacy Manager)

Pharmacy was also trying to allocate the costs of the remaining centrally funded services.

"I'm now working on a way to fund it via an indirect cost to the clinical directorate service. The indirect costs include things like DI, management, training, education and training from M (pharmacist) and clerical and secretarial support. These are in the contracts already so the price they pay reflects the direct and indirect costs of the service. They know they're buying this at the moment. " (Chief Pharmacist)

Directorates were usually clear about their requirements for pharmacy services and were starting to demand proof that contracts were being met. The former low expectations of pharmacy had given way to tough negotiations to obtain good contract terms.

"I think it's probably quite expensive .. I don't know if I'd change anything in particular though. Yes you could say at the end of the year I don't want that. You could look at the real benefits of the top-up system. We've used pharmacy rather than our own staff to do it but we will consider it. We do a cost benefit analysis all the time to look at our services to see if they are value for money. " (Clinical Services Manager).

Doctors and pharmacists realised that real savings on drugs could only be made for a finite time. Thereafter the preventative saving and other benefits of the directorate pharmacist would have to be considered. Some directorates had not bought services because their drug budget was small or very well controlled or due to interprofessional conflict or lack of a perception of need.

6.2.3. Equity.

A danger of the directorate service, that was mentioned by pharmacists and non-pharmacists, was its potential for creating an inequitable service. At the site where services were contracted this was acknowledged as an issue. Purchasers of the contracted services thought that those without them were receiving a lower quality service, with implications for the quality of the overall care received and control over drug expenditure. One nurse manager said that the old,

centrally-funded, system, where decisions on service provision were made by the District Pharmacist, ensured good levels of services for all.

"There are advantages and disadvantages of the directorate system. Directorates that are forward thinking get backing for a pharmacy service but it may mean that others are working in isolation and not receiving a general improvement in services. In a non-devolved structure the DPhO (District Pharmaceutical Officer) could top slice the budgets and then the DPhO could put into place some directorate pharmacy services in all, not just some, wards. It has it's advantages. " (Clinical Services Manager).

Pharmacists said that contracting had emphasised the difference between ward and clinical pharmacy. In the beginning, the inequitable service had upset some clinical pharmacists but most now realised that they could not have continued to provide an unfunded service without adverse long term consequences.

"That attitude "you can't do anything unless you're paid for it" really got to me in the start but, if they'd carried on providing the service and not got paid for it, it'd be hopeless. In the long run it's the right thing for the service. " (Specialist Pharmacist)

In reality, the basic services that were provided to non-contracted wards ensured patient safety and were patient orientated in so far as pharmacists communicated with patients on these wards at least as much, if not more than, at other sites studied. The real difference in service was in the amount of informal education and help offered to medical and nursing staff and in the extent of services that ensured optimal cost-effective use of medicines. One pharmacy manager stated the pharmacy position succinctly.

"What the customer wants is the service we provide. The only reason for us to expand the pharmacy is if we give a good service that helps the clinical director maintain his contracts with the purchaser. " (Pharmacy Manager)

The directorate pharmacy system, especially when based on contracts, led to inequitable services but, traditionally, there had been inequities in service provision, although these were less explicit. Most pharmacy managers ranked wards in order of perceived need; some were considered to be in less need of pharmacy services than others.

"All wards get the basic service but orthopaedics and maternity don't. They don't need it. " (Clinical Pharmacy Manager)

This judgement was not supported by any evidence. Most felt that they could decide which services were needed in each area; decisions were based on their perceptions of patient need, relative drug expenditure in the area, pharmacy needs and prior commitments, such as to teaching. Senior pharmacy managers at some sites were aware that differences in staff skills led to the provision of better quality services to areas served by better qualified, or specialist, pharmacists or those who had more time to spend on the wards. It was unclear to them how this could be avoided whilst maintaining training for junior staff and in the absence of a

system for detecting inequity in service provision.

"One disappointment is that we've put specialists in and let them do what they want. We have four MScs (Masters in Clinical Pharmacy) *at the hospital serving four wards. They may have been the most important and expensive wards but I started worrying about the equity of the service. It's ok to pull out of a ward if all the other systems are in place but I worry about the other groups who are not getting the benefits of their service.* " (Chief Pharmacist)

Pharmacy managers at other sites had, however, intentionally created a system where specialists provided services to a small proportion of the hospital. The remainder received a lower standard of service from time-constrained junior pharmacists. At one site every effort was made to ignore the resultant inequity. It was considered of prime importance to place specialist pharmacists in a stimulating and rewarding environment.

"We can't put a pharmacist on orthopaedics. It's too boring. And GU (genito urinary) *is mainly OPD* (out patient) *stuff. There's not much there".* (Clinical Pharmacy Manager)

More junior pharmacists felt that the inequity was inherently wrong and had reduced pharmacy credibility with medical staff. One clinical pharmacy specialist said that the institution of a directorate system would bring the inequity to doctors' attention. They would realise that most services were provided to two directorates and the remainder were getting little input although they all would be paying the same amount to the pharmacy for the service.

6.3. Roles for Hospital Pharmacy - Specific Barriers and Opportunities.

In a thesis that focuses on the clinical role of the hospital pharmacist, it may seem strange that the first role in this section is that of medicine supply. The reason for placing the supply role in this chapter, and for placing it first in this section, was that almost all non-pharmacy interviewees emphasised this role. This occurred despite interviewees being asked specifically about pharmacy's newer, more patient-orientated roles.

6.3.1. Supply of Medicines.

All interviewees felt that the supply of medicines of an acceptable quality was an essential role for pharmacists. This included the procurement of medicines at competitive prices, protection against shortages of essential medicines, particularly at night and over weekends, storage and distribution of medicines, and their supply on prescription to in- and out-patients. Pharmacists thought that these roles underpinned all advisory services.

"The basic service has to be in place, that is the supply service. That's how people see it, especially the nurses and junior staff. They think about if pharmacy gets things done on time". (Clinical Pharmacy Manager)

At one site, pharmacy promoted knowledge of their responsibility for the quality of the drugs supplied by encouraging ward staff to report defective products and ensuring feedback of the final outcome of queries in this area. As well as medicines, some pharmacies supplied dressings and oral nutritional products. Others felt that these were areas into which they should expand. The provision of trial medicines was always considered to be a pharmacy role.

6.3.1.1.   Procurement and delivery of medicines in the hospital.

In general, there seemed to be little or no ownership of drug ordering, delivery or storage within the hospital. The procurement of medicines from outside the hospital, however, and their subsequent storage in pharmacy were clear pharmacy roles. Disagreement existed on responsibility for maintenance of appropriate ward stock levels. Most nurses thought that pharmacy should monitor and control the supply of medicines using a (technician) top-up service but pharmacy staff disagreed, arguing that they lacked the necessary resources and that it was an inappropriate use of technicians. Technicians thought that it was a nurse, or pharmacy assistant (less-highly qualified staff than technicians), role at sites where technicians' roles were well developed. In contrast, technicians were keen to provide this service where their roles were poorly developed since it got them more involved with the provision of care.

"In other places techs (technicians) *do top-up. I don't think it's what technicians are trained to do. It's the nurse's job, or assistants, but you don't go to college for two years to do that. Techs are keen to do it elsewhere because it's their only chance to get out of the department. It reflects the level of responsibility that they've been given."* (Chief Technician)

Pharmacists and nurses both felt responsible for ensuring the proper storage of drugs on wards but there was little clarity about this role. Some pharmacists checked medicine storage, or had technicians do so, although they felt that it was a nursing role.

Managers cited nurses' inability to maintain appropriate stock levels, and nurses cited the inappropriate use of their time, as reasons why pharmacy should provide the service. Sometimes management enforced a decision to make nurses responsible for top-up to the annoyance of nurses. Nurse and business managers suggested computerised ordering as a possible solution. At some sites, ward pharmacists advised nursing staff on correct stock levels using computerised drug use data but left the actual ordering of drugs to the nurses. Where nurses had failed to maintain appropriate stock levels, or where unsuitable ward staff were ordering, a top-up service was provided. This service was managed by pharmacy technicians in consultation with pharmacists and it pleased all concerned. The availability of ward resources for the purchase of services, and the ward's need for the service, influenced choice

at one site. Prompt, responsive and reliable delivery of drugs within the hospital was important to nursing and medical staff. Problems with this service were a source of much dissatisfaction for nurses. Pharmacy depended on porters, often not employed by or exclusively for them due to lack of resources, to deliver medications. Most pharmacists failed to notice delivery problems where they existed, and when they did, they failed to address them.

6.3.1.2.   Supply to individual in-patients.

Responsibility for ensuring adequate supply, particularly re-supply, of individual patient items was unclear. In practice two systems operated in parallel. Either ward pharmacists detected the need for new drugs, or their re-supply, during routine prescription monitoring or nursing staff requested them, verbally or in writing, from the pharmacists on the wards. Nursing or ward staff often went to pharmacy to obtain urgent items or those missed by, or prescribed after, the ward pharmacist's visit. Nurses, managers and pharmacists felt this was inefficient. At two sites, pharmacies were trying to address the problem.

"The other piece of the jigsaw is the pneumatic tube. It will link ward satellites to the central pharmacy and give us a handle on the question of responsiveness " (Chief Pharmacist).

All interviewees thought that pharmacists should be responsible for dispensing medicines, even if the task was performed by technicians. Pharmacists had delegated dispensing to technicians at some sites but delegation of the complete process was hampered by pharmacists' reluctance to delegate and technicians' reluctance to assume responsibility for dispensing. At one site this severely hampered services. Some older technicians feared the magnitude of the responsibility and found the change traumatic. Pharmacists often failed to appreciate the problem.

"I went through the accreditation scheme. I'm not really brave about it. I'd nightmares about it at the start. I said it to C (pharmacist) but she couldn't see it. I said you've got your whole pre-reg (pre-registration year) to get used to it before you take on that responsibility. ... I was very aware it was a very big change for me. They've been very supportive in pharmacy but it's still a big change. " (Chief Technician)

All interviewees thought that pharmacy should supply in-patients and day-patients with medicines to take home (TTOs). At two sites there were large delays in providing TTOs. Most thought that pharmacy was not coping well with the increased workload caused by the increased patient turnover. The failure in the supply system was a key problem for the operation of discharge planning.

"Despite having a huge pharmacy department here the dispensing of drugs is the slowest, and

most complicated, process. Patients often have to go home with out them and come back for their tablets ". (Senior Registrar)

6.3.1.3.   Supply of reconstituted intravenous products.

Most interviewees, particularly doctors, thought that pharmacy should supply pre-prepared intravenous medicines, for example Patient Controlled Analgesia (PCA) medications, Total Parenteral Nutrition (TPN) and intravenous (IV) (including chemotherapy) agents, for reasons of convenience, safety, quality, efficiency and cost.

"They provide us with a very good service. Anything that goes into a patient through a vein, even potassium, is from pharmacy. Virtually nothing isn't. It is good. Mistakes in prescribing are avoided and asepsis is adhered to ". (Consultant)

Pharmacists agreed on this role but defended the lack of an IV additive service at some sites on the grounds of scarcity of resources. One nurse disagreed that pharmacy should have a role in supplying IVs on the grounds of patient safety and convenience.

"If you have a minibag hanging you are not administering the drug if it's running freely into the patient. You can't stop it instantly. If I'm giving it by IV push I can stop it instantly. If you can't do that there's trouble. They found a patient dead. It put me off giving drugs by minibags. " (Ward Sister)

She claimed that nurses could reconstitute IV drugs adequately and argued that patient convenience, and carrying out the doctor's wishes, were of prime importance.

"There's no reason why nurses can't add a few ampoules of drug to normal saline. I don't see it as a problem. It doesn't need to be done in a sterile pharmacy room. Now we have always got the stock here. We have to have an adaptable service to serve our patients' needs. There's no problem with nurses making up IVs as long as they do it aseptically". (Ward Sister)

At another site a nurse manager ignored health and safety regulations in a system where nurses reconstituted chemotherapy in unsuitable conditions. Only a newly arrived pharmacist was gravely concerned.

"I was aghast that, firstly, we weren't concerned and, secondly, that the nurses were doing it. Their attitude totally amazed me. When one of the wall extractor fans broke the nurses wouldn't do it ". (Clinical Pharmacy Manager)

Where pharmacy did not provide central intravenous additives (CIVAs) the reasons given included lack of pharmacy resources, of facilities and of awareness of the issue.

"When patients are on complex IVs like chemo (chemotherapy), *they should be made up by pharmacy. It would be better for us and for the patients. I suppose it's regarded as trivial by them. For the houseman it seems the obvious thing that they do it. Maybe they don't regard it as important ".* (Clinical Director)

Junior doctors, particularly the most junior (the house officers), or nurses provided the service at these sites although they admitted their ignorance of the drugs and their unsuitability to the

task.

"One of the other things that's different is chemotherapy. For things like bowel cancer we used to have to make it up and it was always on my weekend. On my first day as a SHO (senior house officer) the new house officer had to do it. He hadn't a clue what he was doing. So I stayed behind and did it for him even though I wasn't on call. I was raging. It's dreadfully unfair making up something that you're unfamiliar with. It's different with something like 5-FU (a chemotherapeutic agent) *that you know. The very first time I did it, I didn't have a clue. We are never shown how to make up even IVs so I splashed it in my eye. I had no idea what 5-FU could do to your eye really. After that I discovered that people normally wore a gown. Then someone told me that there were goggles somewhere too".* (Senior House Officer)

Doctors felt that the system remained unchanged because junior doctors are a source of cheap labour. In addition, junior doctors simply accepted the established system and did not have the time to fight for alternatives. Furthermore, a change in the system to release resources would be necessary to facilitate the provision of CIVAs by pharmacy. Nurses had often requested that pharmacy provide CIVAs but had been unsuccessful because of the cost factor and because the ward could not, or was unwilling to, provide pharmacy with the necessary resources. Sometimes the stimulus for this request was the shifting of IV preparation and administration from doctors to nurses to reduce junior doctors' hours. Nurses did not mind preparing IVs except during busy periods and at night, when it often fell to night sister. Nurses felt this was a poor use of her time. They felt that there was a particular need for a CIVAs service in areas prone to error, such as paediatric units, and it was perceived that it would enhance the hospital's competitive edge to have a safe CIVAs service. At sites where junior doctors gave all IVs, they were keen to obtain the service but the reluctance of medicine to lose house officer posts was felt, by pharmacy, to be a barrier at one site.

Where pharmacy supplied pre-prepared IVs, this was often on the grounds of reduced wastage, improved product quality and savings in nurses' and doctors' time. These factors were seen as important and CIVAs were funded by the wards on this basis, at some sites.

"The CIVAs service has worked very well. It seems ridiculous to use all a vial when you don't use most of it and you end up wasting it. It's very popular on the ward. It's saved nursing time and nurses on the ward and reduced costs and increased quality by having the right dilutions. " (Clinical Director)

Junior doctors suggested that pharmacy provide epidural solutions. At a site where clinical pharmacy services were relatively underdeveloped, anaesthetists would happily provide the first epidural dose but preferred if pharmacy provided subsequent doses due to its disruptive effect on theatre routines. Pharmacists and others thought that the preparation of IV additives was part of pharmacy training, hence it was a logical role for them.

"The junior doctors were doing the cytos (cytotoxic chemotherapy). *They were the least*

experienced ones and the ones who were going to be able to make the greatest hash of things. And junior doctors are not specifically trained to make up therapies, unlike nurses. To be honest even a simple mistake could lead to greater consequences with cytos than with other IVs. We said we were going to have to look at this. The trend was to do centralised cytos, the strong trend was to do it in pharmacy. It's the only course where we're specially trained in aseptic techniques except for microbiology. It's logical that it went to pharmacy. (Technical Services Pharmacist)

Some though that the production of CIVAs restored the pharmacy production role and re-expanded their professional territory. A number of junior doctors though that pharmacy did not tell doctors they could provide IVAs because they would be overwhelmed by the demand for them.

6.3.1.4.   Supply to day and out-patients.

The supply of medicines to out-patients was also considered by all interviewees to be a pharmacy role although there was an awareness amongst pharmacists and non-pharmacists that this had been an area of conflict. Usually the conflict had been caused by hospitals supplying drugs for shorter periods than was considered safe and appropriate by general practitioners (GPs) but in Northern Ireland the opposite was true. There, community pharmacists were strong and had objected to, and prevented, hospital pharmacies supplying drugs to out- and day-patients. The hospital lost money since it often supplied those with urgent needs or gave them the remainder of containers that had been opened in hospitals. Although the system of drug supply to out-patients is similar in Scotland and Northern Ireland, conflict was not mentioned by any interviewee at the Scottish site.

Home IV therapy was provided for patients at one site and was under consideration at another. Ongoing supplies were arranged through a commercial company under pharmacy guidance. This, the chief pharmacist claimed, ensured a good quality service since hospital pharmacists checked all prescriptions, and ensured that a supply system was in place, prior to patient discharge. The service had difficulties at the beginning due to lack of funding but these had been overcome.

6.3.1.5.   Supply out-of-hours.

Outside normal working hours, medications were obtained from pharmacy, via a resident pharmacist, or by medical or nursing staff from an emergency drug cupboard. Nurses commonly borrowed drugs from other wards. They, and some junior doctors, felt that pharmacists should provide medicines out of hours and were generally in favour of extended

pharmacy opening hours and, possibly, a residency service. Nurses were annoyed at having to take the responsibility for calling a pharmacist out to supply drugs after hours. Many pharmacy managers were aware that pharmacy opening hours were unsuitable and should be altered to reflect patient and professional work flow. They cited pharmacy staff's reluctance to work shifts or late as reasons why it would not happen.

"We don't understand patient processes and prescribing. When is pharmacy needed? If you look at the admission process, a lot of the prescribing is done at the end of the day, when the pharmacy is closing or after we have left the ward. ... If we were logical we'd provide a 24 hour service. Why not? Because it doesn't suit us to. Is it reasonable? No, I wouldn't say so but the attitude to work, even to pharmacy work, is not what it used to be. We need a lot to persuade pharmacists to offer something like flexitime." (District Pharmaceutical Officer).
"Technicians are very much clock watchers. Just between me and the wall, we've had trouble here in setting up the extended service because they didn't want to stay past 5 o'clock". (Specialist Clinical Pharmacist)

At sites without a residency service, pharmacists considered the availability of a pharmacist on call from home generally adequate for the supply of drugs. Some had resisted the provision of services on Saturdays due to fears of abuse of the service.

6.3.1.6. Reduction in waste of medicines.

Some nurses were concerned about the lack of pharmacy activity in reducing medication waste, especially that of drugs brought into hospital by patients. They felt it was a pharmacy rather than a nursing role to reduce waste.

"One of the awful things that grieves me is the issue of waste of drugs patients bring into hospital. I used to put lots of drugs belonging to patient into the pharmacy box. They'd go to pharmacy and be destroyed. That cost a lot. And we got complaints about it from the patients. It's their property so, frequently, that scenario of the patients' complaint was added to the waste and there was no explanation about it. It caused a lot of anxiety. I talked with the pharmacy at the time .. and the pharmacists would try to match the patients drugs to the TTO (to take out). *But the system was of a limited pharmacy service so the pharmacists couldn't support me in saying what matched the TTO and say we could now give her back her own supply. Nobody would take the responsibility of saying .. that* (the patient's own) *Zantac was the ranitidine on the TTO. And the pharmacist had no time to do it. I'd like to see the clinical pharmacist doing it.*" (Nurse Manager)

6.3.2. Provision of Information.

6.3.2.1. Provision of information for national and regional networks.

A regional Drug Information Centre (DIC) provided information for the national DIC network, Pharmline (national abstracting service) and drug bulletins and evaluations. This was a role undertaken voluntarily by large DICs and drawn on by other DICs. The service is part

of a national, co-operative, network. To date, those providing the services and the Regions, who fund regional DICs, were happy with this situation since the co-operation was on a reasonably equitable basis. This DIC had recently sought users' opinions on the service to ensure it met their needs. Its manager felt that this would ensure some protection against the threat of the demise of national co-operative networks from hospital managers in trusts. The threat was twofold; managers in trusts with DICs that were contributing to the national networks might want to generate profit from the services and those at other hospitals might refuse to pay for them.

"By having work sharing nationally we have co-operation on a reasonably equitable basis. It's not paid for by the hospitals but we all benefit. I'll be sad to see it go. If it does, it will be replaced by a commercial interest. Any change represents an opportunity but, equally, there are threats. I'd prefer co-operation but, if not, then I'd prefer it to go to open competition. I don't want a half way house. I'd rather know where I am with it. There are signs now that national co-operative things are being accepted but I don't really know what will happen."
(Drug Information Pharmacist)

6.3.2.2.   Provision of drug information in the hospital.

All interviewees thought that the provision of drug information was a key role for pharmacists both during pharmacy opening hours and after pharmacy had closed. Many pharmacists considered it a normal part of their work to reply to any queries received on the wards but some used the drug information centre to respond to such queries. At all sites, information was provided by pharmacy to health care professionals and patients within and outside the hospital. Sometimes, formally designated DIC pharmacists provided the information but, often, it was provided informally by directorate, specialist or other pharmacists. At a site that held contracts with clinical directorates for the provision of drug information, a technician was used to help in its provision. She carried out searches, wrote replies to queries and performed routine work, such as the updating of information sources, under the supervision of a pharmacist but was not allowed to answer telephone queries. Some sites had a DIC but others provided information using a stock of books and journals located in the pharmacy and contacted more specialist DICs where necessary. Some pharmacies attempted to ensure that junior doctors and other knew about the drug information service by advertising its existence in the formulary/newsletters. Information was usually provided on request rather than spontaneously although the latter was becoming more common with the introduction of specialist and directorate pharmacists and pharmacist attendance on ward rounds. Many DICs replied via the pharmacist serving that area. Pharmacists were confident about the excellence of, and need for, this service even at sites without a DIC. Drug information was provided out-

of-hours by a residency or on-call service but often doctors, and sometimes pharmacists, were unhappy with the service.

"The ones on-call aren't much good. They read stuff to you from the data sheet. We can read that ourselves believe it or not. They don't give us any extra information. " (Registrar)

The provision of financial information by pharmacies is addressed under "cost control".

Medical and nursing staff considered pharmacy an excellent source of drug references and information. Where a DIC existed, most doctors distinguished between the services provided by the DIC and those provided by the ward pharmacist. A few thought that the provision of information as a result of in-depth literature searches was beyond the normal duties of ward pharmacists because searches are time-consuming to perform. Most non-pharmacy staff used pharmacy information services extensively. They said it was adequately or very well-provided, freely available and highly valued. DIC staff, and ward pharmacists who answered queries, were always thought to be extremely helpful.

"We've got a very good drug information centre here. They're very very helpful. We consult them about a lot of things. We use their expertise to help us " (Clinical Director)
"The pharmacy are our first port of call if there's any agent we need to know about. N (pharmacist) gets us all the data currently available. They (pharmacists) are very good for provision of information. " (Senior Registrar)

Doctors, in particular, would welcome a more pro-active drug information service. Most valued information on aspects of drug use with which they were unfamiliar, such as TPN and paediatric doses. DI was valued also at sites where specialists were absent, for example clinical pharmacologists. In contrast, specialist doctors were more interested in information on drug availability and delivery devices than on pharmacological actions of drugs. Junior doctors contacted pharmacy information sources for drug doses especially in specialist areas, such as paediatrics and cytotoxics. Other information that was commonly requested included the identification of side effects and interactions, and information on drug availability, choice, new drugs, pharmacology, pharmacokinetics, costs and cost-benefit. Consultants saw drug information as an updating service on changes in drug therapy and a foil to the pharmaceutical industry. They, and nurses, welcomed the newsletters provided at some sites. Some suggested the provision of ward manuals, giving basic information on commonly used therapies, and the use of newsletters published by larger DICs where pharmacy resources were limited. Nurses readily used pharmacy information sources and commonly inquired about doses, costs and value for money in drug choice. They indicated that patient information leaflets (PILs) would be welcomed as a source of information for nurses as well as for patients. Nurses could use PILs to enable them to answer patients queries on their medicines.

6.3.3. Provision of Education for Pharmacy Staff.

Most hospital pharmacies had a continuing education program for their staff and felt that significant amounts of resources were invested in education and training. The majority of junior pharmacists were trained to provide clinical pharmacy services. Pharmacists could usually proceed to diploma or MSc qualifications. Education was provided frequently in-house by senior pharmacy staff. Such education often complimented courses provided by Schools of Pharmacy. At one site, pharmacist training was formalised on the medical model with senior specialist pharmacists acting as mentors for junior pharmacists. Training was provided frequently to facilitate the provision of services when specialist pharmacists were on leave. A site with a regional DIC produced current awareness bulletins for pharmacy staff. Pharmacists also pursued self-education by attendance on ward rounds and, at a site with little opportunity for education, by preparing material for teaching other groups.

Junior staff were often attracted to a pharmacy because of the training opportunities. Systems where junior staff were tutored by their senior colleagues were valued. At sites without this system, or where the system had failed due to loss of specialist clinical pharmacists, junior, and even specialist, staff felt that they had to depend on senior medical staff for support and peer review. There was a general feeling at a number of sites that pharmacists should specialise to be experts and to train others.

Improved education was thought to have increased pharmacists' skills and the quality of their contribution to the multidisciplinary team, and given them the confidence to interact with medical staff and provide clinical services.

"The basic level of clinical competence has improved, particularly in the B/C grades (junior grades). *It arises from a very good Part I (Diploma in Clinical Pharmacy) course.* (Chief Pharmacist)

"As I see it, basically, to be effective as clinical pharmacists you have to be knowledgeable, to have the right education and training to be able to identify problems associated with care of patients. " (District Pharmaceutical Officer).

"I'd like to see pharmacists as co-partners with physicians and to get a good dialogue established. Pharmacists felt a bit threatened in the 1970s. They couldn't talk to the house officers. So I said "Why don't you make a contribution when the pharmacists are more highly skilled?". (Clinical Pharmacologist)

In addition, the requirements of certain courses meant that pharmacists were attending ward rounds when this might not otherwise have been the case. Some doctors commented that the theoretical bias in pharmacists' training made it difficult for them to perform well in the patient care area where there were few hard and fast rules.

"There are two things. First pharmacists are very well trained and know what they're talking about with respect to pharmacy. They're not always on the ball when applying it to the patient situation. They used to, at least until they got a bit of sense, ring me up about doses outside the BNF (British National Formulary) dose. There is a dichotomy between the theory in the books and the position on the ward. ... Pharmacy is a good thing on the ward rounds. You can tell them things. It's an applied science and they can tell you things. Some are a bit divorced from patients" (Consultant)

At the individual level, good communication and interpersonal skills were considered to be as important in achieving success as knowledge.

The NHS changes were thought to have potential negative effects on the funding of pharmacist education.

"In the new NHS Trust environment it will be more difficult than it has been to develop services. Trusts don't recognise that professional people need training and professional contact. Here, the training budget has been independent but it may not be in the future." (District Pharmaceutical Officer)

Ways forward were, however, being explored at a few sites.

"At the moment pharmacy aseptic costs are put into our costs (haematology/oncology). All the essential pharmacy stuff has been put in. Research and education are both problematic. We're trying to have costing for them (for pharmacy) to get a research and development strategy put into the business plan" (Consultant).

Education was provided for pharmacy technicians by pharmacists and senior technicians. For pharmacy roles, such as the checking of dispensing, it was provided by pharmacists but education on technical aspects of services, such as aseptic dispensing, was provided by technicians. Technicians also trained pharmacists in technical roles. The provision of technician education to facilitate role delegation was a priority in several sites.

6.3.4. Education of Non-pharmacy Health Professionals in Hospitals.

The education of non-pharmacy health care professionals ranged from formal schemes to informal education via other services, such as ward pharmacy.

6.3.4.1. Education of doctors.

Doctors thought that pharmacists' attendance and activities on ward rounds and the ward pharmacy and other advisory services, helped educate (mainly junior) medical staff about drugs. These activities also informed them of pharmacists' roles in therapy and hence facilitated the appropriate use of pharmacists. Most doctors wanted to increase the education

that they received from pharmacists and suggested journal clubs, lectures, updates on drugs, one-to-one education in informal settings, written information on common therapies (via the formulary or other means), and ad hoc sessions on prescribing as a means of achieving this.

"More active teaching, like a drugs update every three months for the juniors as well as the consultants, would be good". (Clinical Director)

Clinical directors said that pharmacists often failed to take opportunities to educate doctors during routine activities.

"Education for junior doctors isn't only at induction. They are educated in indirect ways. P (pharmacist) is attached to the clinical meetings. She contributes. She asks doctors why they prescribe this and that. " (Consultant)

If directorates had to pay for pharmacy services, however, some would require pharmacists to provide more education to doctors in informal settings and via written material.

"If I had the decision, I'd make sure they would function as medical staff educators. That there's access to reviews. A lot of stuff that is given to doctors is misleading. We asked here that the bulletins from R (another hospital) are provided. Every local pharmacist has to bear in mind their responsibility to educate and to guide". (Clinical Director)

Most junior doctors welcomed education provided via advice from pharmacists on the wards or on rounds. They highlighted flaws in the current induction provided by pharmacy.

"We have an introduction morning where we have a talk for an hour and a half on the dose of radionuclear medicines. There's no help at all in how to write up a drug chart and that's what we're all worried about. We were really worried about it. What doses to use and so on. You want to know about practical things. " (House Officer)

Doctors recognised that it might be logistically complex to provide induction training due to the difficulty in getting a group of junior doctors together, uninterrupted by bleeps, for a sufficiently long period. Some doctors also thought that pharmacists could educate them about drug costs and cost-effective prescribing and said that pharmacy information sheets often failed to reach them. They frequently requested more formal teaching on drugs and therapies.

Clinical pharmacologists felt that pharmacists should be much more involved in medical education and felt that the excuse of lack of time was a symptom of over-concern with saving money and of a lack of concern about improving the quality of prescribing. This was seen to have reduced the co-operative spirit between medicine and pharmacy. Doctors were no longer colleagues in need of help, advice and education to use drugs wisely.

"I've had to fight to retain the educational aspects of the doctor-pharmacist interaction and to maintain the idea of helping each other as colleagues. Now it's "I'll do something for you so you spend less on your drugs". It's a financial judgement only. That's what pharmacists did years ago at the start. Pharmacists then worked as policemen of the drug budget. They'd send out edicts saying "thou shalt stop using A and start using B". That got doctors bristling. We're going back to that now" (Clinical Pharmacologist)

The financial orientation was thought likely to endear pharmacy to managers and to ensure its

survival but was thought also to have a damaging effects on interprofessional relations.

Service managers and nurses indicated that the provision of education for doctors was worthy, and in need, of development since it led to a higher quality service.

"She (the directorate pharmacist) *checks individual charts and, an on-going basis, she acts to improve education and communication with junior doctors so that standards are retained even though the doctors change every 6 months."* (Clinical Services Manager)

Pharmacists were generally unaware of the extensive educative role that they were perceived to fill. Interventions as a result of prescription monitoring were considered by doctors and nurses as much needed and valued education, but were seen by pharmacists as a failure of their efforts to educate doctors. Most pharmacists did not consider it continuing education for rapidly changing junior medical staff. They were reluctant for the ward pharmacy service to be considered an educational and corrective service and would rather provide education in more formal ways. A few pharmacists were more aware of their educational role and rejected writing interventions in the notes on the grounds that it would reduce their potential role in the education of doctors by decreasing face-to-face interactions between the pharmacist and the prescriber.

"If we are recording interventions, that's ok. Writing in the notes? I wondered if we'd run it by them (doctors). *But we'd have to be careful about the educational aspects of it for doctors. That's why we feed the interventions back to them directly".* (Directorate Pharmacist)

One pharmacist thought that pharmacists could provide doctors with lectures on good prescribing and some already educated doctors about TPN and nebulisers. At all sites, pharmacists had limited involvement in formal post-graduate medical education although a pharmacy manager at one site wanted to develop this service if given the resources. As with induction sessions, they said that the difficulty in bringing junior doctors together uninterrupted hindered the provision of formal education as did lack of pharmacist time.

6.3.4.2.   Education of nurses.

Pharmacy departments routinely provided education for nurses. for example IV study days and education on drugs and equipment. All pharmacists thought that these activities were worthwhile and some wanted to increase them. Nurses thought that pharmacists contributed to their education in formal and informal settings, appreciated these services, and would welcome more education on drugs, patient counselling, and the selection and teaching of nurses in need of education. They emphasised that sharing of knowledge increased patient care indirectly by increasing carers' knowledge.

"When it comes to education, it's a matter of sharing knowledge, not keeping it to oneself". (Staff Nurse)

Nurse managers and managers highlighted the opportunities for education provided by the interactive ward pharmacy service and the contribution this made to patient care.

"She (pharmacist) will go through it (patient information leaflet) with the patient. It's also useful for the nurses who are not familiar with a drug. It may be a resource for education of nurses, an off-shoot". (Staff Nurse)

Pharmacists may also have a role in teaching future nurse prescribers.

"Nurse practitioners can't prescribe yet but they will. They're going to need more guidance and education. " (Nurse Manager).

Doctors and managers alluded to pharmacists' valuable contribution to nurse education via the routine ward activities and indicated that pharmacists should teach nurses how to educate patients about drugs and prescribing regiments.

6.3.4.3. Education of other non-pharmacists.

Some pharmacies trained professions allied to medicine although few pharmacists mentioned this role. A few junior doctors said that pharmacy should be more involved in this. Senior pharmacists often considered pharmacists' activities in team services as an educational experience.

"What we're really doing may be training others, especially nursing staff, to treat patients better. It's a mixture of direct and indirect initiatives. " (District Pharmaceutical Officer)

6.3.5. Research.

Pharmacists' involvement in research was often confined to the planning and co-ordination of clinical trials. This involvement varied from dispensing the drugs and maintaining records to advising on trial design. Doctors valued highly pharmacists' assistance in trials and specifically mentioned their roles in evaluating new therapies, assisting with blinding, co-ordinating trials and liaising with the drug companies.

"They supervise drug trials. We do few conventional ones here. They are especially valuable for evaluating potential therapeutic advances. They do the blinding. They liaise with the drug companies. They're really important. " (Clinical Director)

Doctors would like to see pharmacists becoming more involved in evaluative research on new drugs, and in research in general, but knew that such involvement was still limited.

"Research and clinical studies ought to happen but they don't. They (pharmacists) are too busy doing other things" (Consultant)

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"I'd like to see more done in new drugs research, to give me information on new drugs, the pros and cons, CBA (cost benefit analysis). I encourage them to do research projects locally. I'd like someone here to do research. I wouldn't say they are hugely active" (Consultant)

Doctors felt that pharmacists should be involved in evaluating the quality and effectiveness of the care provided by the multidisciplinary team rather than pharmacy services in isolation. This view was based on the belief that pharmacists often exert their influence on care through others, for example by influencing doctors' prescribing and by improving nurses' abilities to counsel patients effectively on discharge. In contrast to doctors, few nurses and managers mentioned pharmacists' role in research outside the context of clinical trials and economic studies (see Section 6.3.8).

Pharmacists agreed that they had a role in clinical trials and most would like to be more involved in research, given the resources. One District Pharmaceutical Officer (DPhO) said that pharmacists should follow the medical model and perform research during their training and subsequent career, with an emphasis on pharmacy practice research.

"I always believed that we should follow the medical model. Doctors did three things, they practised, they did research and they taught. That would be someone like a senior lecturer in medicine. " (District Pharmaceutical Officer)

A pharmacy manager at one site indicated that the postgraduate courses in pharmacy had increased pharmacists' involvement in practice research. Uncertainty, change and cost containment pressures had reduced pharmacy involvement in research at some sites. The absence of long term pharmacy practice research strategies was also though to be detrimental. Some pharmacies were, however, involved in multidisciplinary and pharmacy practice research on a small scale but this was not mentioned very often as a priority by pharmacists.

6.3.6. Therapeutic Advisor.

Pharmacists were considered to have a significant role as advisors in hospital drug policy and for individual patients' therapy. They could advise independently or as part of a team. They advised also on cost control, in addition to therapy, but this role is addressed later. The acceptance of their advice by doctors was seen as the main determinant of the effectiveness of their services. Clinical directorates have increased the need for, and facilitated, this role.

6.3.6.1.   Creation, implementation and assessment of drug use policy.

6.3.6.1.1.   Creation of policy.

All pharmacies were involved in the creation of drug policy, including formularies,

prescribing guidelines and therapeutic protocols and, more recently, discharge planning. In some cases DICs provided information for policy creation; in others, formulary pharmacists were responsible for policy creation; at further sites specialist or directorate pharmacists were responsible for policies in their own areas only. There was general agreement on pharmacists performance of this role.

Formularies and drug policies were seen as co-operative ventures between health care professionals.

"I'm not on the drugs panel (Drug and Therapeutics and Formulary committee), *although I believe that that's a very good thing. A lot of very important decisions are made there. A lot comes out of it like the drugs guide. L (Clinical pharmacologist) is guiding this but I know that a lot of the senior pharmacists have had an enormous input too. It's a good example of a co-operative venture. A lot of the doctors have contributed to it in their own specialty but I'm perfectly sure it would never have been possible except for the pharmacists' contribution. "* (Clinical Director)

The feasibility of retaining a single formulary, given the demands of the directorate system, was under discussion at several sites as was the effect of fundholders on formularies and the power of the Drug and Therapeutics Committee (DTC).

"At present the hospitals DTC is powerful but, in the future, GPs may decide which drugs go in the formulary. Prescribing may be GP led not hospital led. " (District Pharmaceutical Officer)

Clinical directors and managers were especially aware of the pharmacists' role in drug policy creation and wanted this increased.

"I'd be perfectly happy for pharmacists to be more forward and more involved in this sort of work". (Clinical Director)

Doctors thought that activities in this area helped control drug expenditure, ensured quality prescribing and educated junior doctors.

"I have worked in hospitals with a formulary. I think it might be useful here for junior staff but I think it's really for provision of advice and guidance to junior staff and to other staff to some extent". (Clinical Director)

Junior doctors found drug policies helpful, especially when they were new in a hospital and unaware of their consultant's normal prescribing patterns. Drug policies were considered also to be a useful educational tool.

"The other thing we don't have here is a formulary. In a way it helps us. You become familiar with the drugs being used. A lot of my friends have used formularies where they work. You become aware of the side effects of the drugs. Here you get a broader knowledge but you are not so familiar with the drugs". (Senior House Officer)

Medical staff suggested roles for pharmacists in policy creation in areas such as anaesthesia

and pain control. They emphasised that the policy-making mechanism should facilitate discussion. Policies should not exist solely to save money but must be an economic tool that improved the quality of care or facilitated the care of more patients. Cost-effectiveness data, although currently lacking, could be used to create policy.

"I have mixed views on it (the formulary). *We have to manage as well as we can. If there's too much clinical freedom you have problems. If you don't control prescribing you have problems. If the extra funding is not there, you have to manage within existing resources. If, for example, A, B and C are equally effective, then you go for the cheapest. Clinical freedom is not just based on CBA* (cost benefit analyses). *The data's not there anyway. "* (Consultant)

Many nurses saw pharmacists' involvement in policy-making as an expression of their expertise and were keen to extend this to the creation of new therapeutic regimens in areas of uncertainty, for example AIDS (acquired immune deficiency syndrome) therapy and thrombolytic therapy for myocardial infarction.

"There's quite a lot of discussion about different things now like tPA (tissue plasminogen activator). *Pharmacists have a role in developing the protocols ".* (Ward Sister)

Many pharmacists wanted to increase their drug policy-making activities. Some had become involved in Anticipated Recovery Pathways (ARPs), or Integrated Care Pathways (ICPs), and discharge planning. Specialist pharmacists had written treatment protocols with the ward teams. The directorate structure was considered to have facilitated pharmacists' involvement in advising on, and creating, drug policy and care protocols since it gave them an overview of the directorate and of therapeutic needs.

6.3.6.1.2. Implementation of policy.

In all but one site, formularies of some sort existed to guide junior doctors' prescribing and to control drug expenditure. Pharmacists thought that junior doctors relied on ward pharmacists to ensure their prescribing was consistent with policies. Junior doctors admitted that they relied on pharmacists to correct minor errors in prescribing. At the site with no formulary, junior pharmacy staff had operated a formulary of sorts and stock levels were well controlled. The chief pharmacist though that they should have a formulary and drug and therapeutic committee (DTC) since these would facilitate the provision of pharmacy services. A formulary was about to be introduced and it was envisaged that pharmacy would help implement it.

"Now we've got one we've got to make it work. It's the process of implementing it. The pharmacy is going to have to help us to do it, to take ownership of and implement the formulary. They will have to answer questions on it for the doctors and identify reasonable cost limits for pharmacy" (General Manager)

Drug policy implementation was aided by the provision of pharmacy advisory services. Advice on drug policy was often sought and provided on ward rounds and during ward pharmacy visits. Doctors valued this and sought greater pharmacy involvement in the provision of advice on errors, generic prescribing, new drugs and alternative ways of taking drugs (methods and devices) and in the provision of comparative cost-effectiveness data. They thought that the advice provided at the point of prescribing was excellent.

"She increases our awareness of problems we'd never think of. She tells me things I've never heard of before. By working with her we provide a better care for some patients anyway."
(Senior Registrar)

Pharmacists' activities on ward rounds were seen as a foil to the pharmaceutical industry.

"At the moment I see them as providers of information and guidance on prescribing, pharmacology, side effects, costs, formulations, as a useful foil for the pharmaceutical industry's promotions". (Clinical Director)

Many said that they would not disregard the pharmacist's advice lightly.

"You always have to remember that the pharmacist is an expert in her field, just like the physiotherapist or the occupational therapist is in hers. What you have to be careful about is overriding what your colleague in another field says. You've got to be very sure of your ground to do that." (Clinical Director)

Some said that an interactive policy implementation service could prove useful in audit. Many junior doctors, however, were unhappy with the inflexible approach of some pharmacists in the application of policies. This inflexibility was attributed to pharmacists' lack of appreciation of team prescribing and the individuality of patients. The result had been interprofessional conflict, especially in the past.

"Sometimes things can be difficult. They ask you "Why are you prescribing that?". It's difficult for a junior doctor. You get put in the situation because the consultant want's to use it and often they're not aware of why not. It's the junior staff who get it" (bothered by pharmacy).
(Senior House Officer)

"The drugs guide is quite regimented. Pharmacy often get it out of perspective. Pharmacists creating protocols and guidelines is all right so long as it's not too dogmatic. Pharmacists see the generalities, not the one-offs. It's the same with policies and drug restrictions. They are fine most of the time but they're inflexible when you come across the exception" (Senior House Officer)

Senior medical staff were unaware often of this conflict since they had to deal with pharmacists on this level only on rare occasions.

Pharmacists' activities in the implementation of drug policies were universally welcomed although there was some disagreement amongst junior doctors on the methods employed. Pharmacists were thought to have helped control drug expenditure in the past. Their activities were now increasing in importance, not only for cost control, but also to increase the quality

of care.

"I'm generally aware of costs and I think they should be kept to an absolute minimum. If you can provide the same treatment for less cost then I think you should" (Consultant)

"Drug efficacy and opportunity cost are also to do with quality. We have to control our drug costs if we are not denying the opportunity of therapy for someone else. It's the whole issue of the price of non-conformism with the formulary". (General Manager)

Managers welcomed pharmacists' contributions to drug policy implementation since it exerted a positive influence on prescribing and increased cost-effectiveness and quality.

"The area where pharmacy contribute most is their contribution to costs control. It's an important area. It's an area where C (chief pharmacist) has contact with management to tell us about trends, blips, new drugs, individual patients causing problems with the drug budget. They influence clinicians, manage is perhaps overstating it" (General Manager)

Where pharmacists were not involved in such activities, managers would like to see this changed and were usually prepared to pay for such services.

6.3.6.1.3. Assessment of policy.

The introduction of directorates was thought to have facilitated pharmacists' increased involvement in the assessment of drug policy and therapy. Some doctors proposed that pharmacists become more involved in evaluating established regimens since many were not based on sound scientific data. Managers and nurses sometimes mentioned this role.

"The urologists have medical audit and A (a pharmacist) comes to those meetings. We've actually changed policies as a result of those meetings and A contributes information to them". (Nurse)

The use of the audit mechanism for policy assessment was felt to be dependent on the availability of standards. Several felt that pharmacy was already making a valuable contribution to audit by providing data on the appropriateness of therapy and the utilisation of drugs. This had helped in policy creation.

"Prescribing policies are created via the audit process, for example in the treatment of hypertension, laxative policies. Pharmacy is involved and is definitely useful. " (Consultant)

"There have been two pharmacy based audits which have been very successful. There were excellent contributions by pharmacy. " (Clinical Director)

Some doctors had not, however, thought of using pharmacists in the audit process.

"In the audit we did there was no input from the pharmacist really. It didn't cross my mind that they could contribute at the time but now I see that perhaps they could have. " (Consultant)

Pharmacists at five sites were, or intended to become, involved in medical audit but not at three others. The development of hospital-wide audit had facilitated pharmacy involvement, as had regional initiatives to involve pharmacy in medical audit. Where pharmacy was uninvolved, their services in general were poorly developed or the issue of audit had not

arisen in the hospital. Pharmacists' envisaged that their involvement in audit would increase.

"Its not an issue at the moment. We are very much in the initial steps. It's coming. I do think its very important. I'll do my best to get involved". (Specialist Pharmacist)
"I'll probably wait until the pharmacy computer system gets geared for it. That's the rate-limiting step. It's not up yet". (Specialist Clinical Pharmacist)

Pharmacists also thought that DUR and the presentation of intervention data at medical audit

or other fora were useful contributions to the quality assurance of drug use.

We're more involved with DUR now. That ties in more with the quality side of drug therapy".
(Clinical Pharmacy Manager)
"I did a cefotaxime audit for them. I collected the information and wrote a report. I gave it to the clinical director. He said come and talk to us about it. I went and explained it all to him."
(Directorate Pharmacist)

6.3.6.2.   Advisors for individual patient's therapy.

This role was exercised by attending ward rounds, being on the ward or on teams and

advising health professionals, and by providing advice over the telephone. Directorate

pharmacists felt better able to provide advice due to their close relationship with the ward

team.

6.3.6.2.1.   Ward Rounds.

Many pharmacists, especially at sites with directorates, attended ward rounds and acted as

advisors on drug therapy, TPN and interactions. Some pharmacists and pharmacy managers

questioned the value of pharmacist attendance on ward rounds, saying that it reduced the time

available for other activities, but most acknowledged its public relations effect.

"It's a bit of a waste of my time going on his ward round. It's really a PR (public relations) job" (Ward Pharmacist).

A few pharmacy managers refused to allow pharmacists on certain ward rounds because of the

resource implications, given what they considered to be its limited value. Some would

reconsider the issue if the directorates held pharmacy staff budgets and were willing to pay.

Most pharmacists, however, thought that the ward round facilitated their provision of

therapeutic advice and helped them understand patients' needs better. In addition, issues could

be discussed and resolved before prescribing decisions were made thereby saving time

correcting such decisions. Most pharmacists wanted to increase their attendance on ward

rounds but were prevented from doing so by lack of time, other commitments and the

unpredictability of ward round times.

Almost all doctors thought that it was a good idea to have pharmacists provide advice on ward

rounds although they would prefer a more pro-active contribution.

"He advises us when we request drug data. So far he seldom offers his opinion. ... The tradition is that you're an advisor (the pharmacist) *rather than volunteering information. ... Generally speaking it* (advice) *comes after I request it rather than being spontaneous."* (Consultant)

Advice was welcomed particularly on TPN, where pharmacists may effectively do the prescribing, on choice of formulation and on the suitability of prescribing for individual patients (including dose adjustment, interactions, contraindications and side effects).

"I wasn't sure how best to make use of his time in the start especially but it has evolved over the period of its operation. Once you have discussed the patient's management and got round to the patient's medication you automatically ask the pharmacist what he thinks. You'd be surprised how often it changes as a result of what he says. It's the job of the doctor to make the diagnosis and prescribe the therapy in a broad sense not just drugs and the pharmacist can advise on the best formulations, the dose perhaps and as regards interactions and side effects. Pharmacists are likely to be more knowledgeable than doctors in that respect". (Consultant)

Most were satisfied with the immediate help provided by the pharmacist and were keen to retain and encourage this interactive pharmacy service within the team setting.

"She is a team member for the ward round. Interactive pharmacy is a fantastic advantage for ward rounds and audit. They make a significant contribution to patient management and to audit in the unit". (Senior Registrar)

If the pharmacist could not attend ward rounds, their presence on the ward for some time during the day was thought to be a next best option. Many nurses and managers welcomed pharmacist attendance on the ward rounds and their advice on drug therapy,. Some nurses would like greater involvement of pharmacists in this role but others had a more negative attitude.

"They (pharmacists) don't go on the ward round. We wouldn't expect them to". (Nurse)

They and some medical staff felt that it would be difficult for pharmacists to find time to do so. A minority of doctors questioned its efficiency.

"I do question at times their role on ward rounds. I just do not know whether that's a good use of their time. They don't have a lot of input into the situation except saying "It's about time you stopped this antibiotic or something". Routinely, I think, they should either attend the ward rounds or do the ward pharmacy but not both. I try to involve them in the ward round. They should be there as a member of the team all the time or not at all. They haven't done that". (Senior Registrar)

6.3.6.2.2.   Ward pharmacy.

During ward pharmacy visits, pharmacists often provided advice to doctors and nurses. The advisory role of the ward pharmacist was considered to be a positive aspect of pharmacy services by all pharmacists. Many pharmacy managers felt that the ward presence was important and should be increased. A few pharmacy managers mentioned that pharmacists

were not working to their full potential because they were unable (lack of resources) or unwilling (lack of perceived need or self-confidence) to stay on the wards and perform activities in addition to routine ward pharmacy (prescription monitoring and supply).

"The problem is we haven't found a way to keep pharmacists on the ward long enough to do more. We tend to be visitors. That's the main constraint and it's a time constraint. ...The difficult bit is to find a way of preventing them going back to the dispensary...But do they want to stay on the wards. Even though they're now clinically trained and therefore should feel less insecure on the ward, it's a bit like being an astronaut. We like having a lifeline back to pharmacy. We've somewhere to go back to. That's because of having to provide non-stock drugs. It's what people are using to give them confidence." (District Pharmaceutical Officer)

Directorate pharmacists often provided advice to nurses on drug administration and advice to doctors on TDM (therapeutic drug monitoring) and on other areas where these groups were inexpert. Some pharmacists felt that they had a role in advising nurses on drug administration but many were more interested in advising doctors on prescribing. At two sites, pharmacists were not very involved in TDM but felt that they should be.

Nurses thought that pharmacists' advice to doctors on drug therapy was necessary and useful. Doctors often saw the ward pharmacy role as a safety net but some indicated that it was also a means whereby pharmacists could discover problems that would benefit from their advice, such as interactions and side effects. Nurses often consulted their directorate or ward pharmacist by telephone, for example about discharge medicines or drug dosages, and would ask the pharmacist to contact the doctor where necessary. Managers welcomed the increased presence of pharmacists on the wards and the provision of advice on all aspects of therapeutics. They were keen that pharmacists be present and advise when prescribing decisions were made to ensure patient safety and quality prescribing.

"There should be greater focus on prevention, not QA (quality assurance) at the end of the line. They need to influence what people do more clearly, to give advice on the effect of different drugs in different circumstances nearer the front part of the process, getting in at the decision-making phase". (General Manager)

6.3.6.2.3.   Other services.

A clinical pharmacologist thought that DIC pharmacists could provide more valuable, useful and relevant advice on therapy by combining forces with clinical pharmacologists or doctors and thereby use both professions' skills. He felt that pharmacists' should recognise the difference between, and value of, the contribution made by each group. Other doctors also expressed the view that pharmacists' and doctors' expertise complemented, rather than being substitutes for, each other.

6.3.6.2.4.   Out of hours advice.

Advice on medicines outside normal working hours was available through resident pharmacists or a pharmacist on call from home. Nurses favoured extended pharmacy opening hours and a residency service. All pharmacists agreed that advice on medicines should be available at all times. Although such a service was available at all sites, even if provided by a pharmacist on-call from home, many pharmacies did not actively advertise the service. Where there was no residency service, pharmacy managers were aware that the advisory services were inadequate, mainly due to the use of inexperienced junior pharmacists. At sites with a residency, pharmacy managers were concerned that it was only a supply service, rather than a clinical service, and indicated that pharmacists should work a shift system to facilitate the provision of advisory services.

"I'd like to see the residents more actively involved in clinical pharmacy when they do their dispensing and supply. Sometimes they are asked questions but often they just concentrate on supply. Because it's a very busy residency - they get information calls all right but - when they are called for Amoxil syrup they just dispense it. Probably it's because they've been working all day not on a shift. If they were working like the nurses, they might be more interested in clinical pharmacy. " (Clinical Pharmacy Manager)

At sites with a residency there was an awareness that a 24 hour pharmacy service was available. Some doctors said that residency and on-call services were sub-standard because the pharmacists employed were too junior to provide the high quality advice that was provided by their usual pharmacist. Non-pharmacists did not, however, seem to expect pharmacists to be available on-site to provide advice on drug therapy outside working hours. Rather, they seemed to favour extending the availability of advisory services late into the evening and at weekends and improving the quality of the advice provided.

6.3.6.3.   Operation of an advisory service as part of a team.

Some pharmacists acted as therapeutic advisors on teams, such as pain, wound care and nutrition teams, and in team-run schemes, such as self-medication and patient education schemes. Team services involved pharmacists as advisors on policy as well as on individual patient's therapy, and, in some cases, in co-ordinating services such as patient counselling and drug history taking. Most non-pharmacists welcomed pharmacist participation in multidisciplinary teams and felt that this improved patient care. Nurses envisaged an essential role for pharmacists in several teams as advisors on drug therapy and were keen to involve them in these.

"We are in the process of introducing specialist teams like wound care teams. The pharmacist is part of that team. We do intend to set up more teams like pain control teams and nutrition teams. That's what we envisage. We see pharmacy taking an active part in these teams. The

teams are primarily coming from nursing but we are inviting the pharmacist onto them I can't see how we could exclude them. If you are talking about wound care, to me the pharmacist is essential to have as part of it. We invited them on". (Nurse Manager)

Doctors thought that a team approach would help prevent drug error and would improve pain control and discharge procedures. Managers thought it could help create and implement prescribing policies. Pharmacists felt it would facilitate the increased use of their skills. Some would like to monitor discharged patients to ensure that medication problems experienced after discharge would be addressed. They would willingly take part in such teams, given the time, but appeared to prefer to be asked rather than to take the initiative themselves. Participation by pharmacists in multidisciplinary activities was viewed differently by pharmacists and managers than by doctors and nurses. The latter saw pharmacists as part of a team whereas the former were less certain and, at times, pharmacists felt excluded. All, however, viewed pharmacists' incorporation as team members positively. Most pharmacists were keen to become members of the team since they saw benefits in this. They felt, however, that this demanded that they spend more time on wards, attending audit and other meetings and attending ward rounds.

"I've been here for two years. I can now make a much more positive contribution. I now have more experience than some of the doctors. Going on the ward rounds I'm seen as a member of the unit. If you're part of a team then they'll ask you questions" (Specialist Pharmacist).

In most cases where pharmacists had become involved in a team service, the initiative came from a profession other than pharmacy. Pharmacy's dependence on others to ask them to participate could be a barrier to service development since other health care professionals often admitted that they had not thought of including pharmacists on such teams. At a site where this was not the case, the pharmacy had a high proportion of specialist pharmacists with an enormous amount of ambition and drive. They were very self-confident and inspired by their clinically-orientated pharmacy managers who firmly believed they should be full team members. Many pharmacy attitudes to team services were based on a medical model of care and few pharmacists were really patient-orientated or had real patient contact. Despite efforts to change, most retained a prescription or policy-orientated approach. Some doctors felt that colleagues who were in specialties which had a multidisciplinary orientation would be more likely to encourage pharmacist involvement in teams, such as in intensive care, pain control and geriatric medicine.

"Some people couldn't work in a team like (for example) orthopaedic surgeons. Most doctors treat pharmacists like surgeons do, do this and do that. An open minded attitude helps. It depends on the specific problem. It tends to be the people who are required to work in a multidisciplinary team looking at the whole patient problem. They are very aware they need all

the others to help treat the patient's problem". (Consultant)

Advice on drug therapy provided on the ward round was considered to foster team spirit and the integration of the pharmacist into the team.

"We actually see the pharmacist here and know who they are. I can put a face to a name. They are just more helpful and happy to come down. That's the whole idea here. They seem to want to be part of the department. In other places I've worked they don't come down. They ring you up and say 'Are you the pratt who prescribed this?' Here they say it in front of you. "
(Senior Registrar)

Pharmacists said that their non-involvement in team services was due also to opposition from non-pharmacists to pharmacy role expansion but non-pharmacists disagreed. No evidence of opposition was found by the researcher despite looking carefully for this at sites where it was mentioned as a problem by pharmacists. Most barriers to pharmacists' integration with the team were internal to pharmacy and involved attitudes and organisational factors. Many pharmacy managers recognised this. Some were involved actively in facilitating team involvement by creating directorate pharmacist positions and by allowing pharmacists the time to go on ward rounds and participate in other team activities. This had been effective in a few sites.

"We've tried to integrate ourselves quietly onto the team over the past few years and we've done it" (Clinical Pharmacy Manager).
"There are only a few areas like oncology where the pharmacy is truly integrated into the team. It's hard to say where else. In the renal team, we've done the dialysis booklet. Pharmacy has to find a different way in. It depends on the specialty". (Clinical Pharmacy Manager)

Pharmacists often tried hard to gain acceptance on the team by being helpful to doctors and nurses and by showing their contribution to cost control. Some formally introduced themselves to ward staff and informed the clinical director of their services.

6.3.7. Optimisation of the Use of Medicines.

Although it can be argued that this role encompasses all pharmacy activities, the discussion here relates to two functions. These are the reduction of risk in medicines' usage and the tailoring of therapy to the needs of individual patients. Reduction of risk in the use of medicines primarily encompassed those services that ensured that patients' therapy was safe. The tailoring of therapy to patients' needs involved services that provided advice on the use of medicines for individual patients. Other contributions to the optimisation of the use of medicines, such as the education of professionals and patients, the provision of information and of advice on therapy, are dealt with in separate sections of this chapter. The optimisation

of the use of medicines was defined succinctly by one manager.

"One important thing that pharmacists do to increase patient care is they enhance patient safety. I liken their contribution to patient care as to optimise the process of therapeutics. Patients getting the best drug therapy that's considered available for particular (individual) patients. If I was a patient I'd want to know what was being pumped into me was safe and enhanced my recovery prospects. That's what clinical pharmacy does." (Clinical Services Manager)

Interviewees wanted pharmacists to continue in this role. It was perceived to be vital since it contributed significantly to the quality of patient care. In the following paragraphs, which discuss ward pharmacy and other clinical pharmacy services, the tailoring of therapy and the reduction of risk are addressed together.

6.3.7.1.   Ward pharmacy.

Pharmacists saw the ward pharmacy service, where pharmacists monitored medication charts, more in terms of reactive risk prevention and reduction than pro-active optimisation of therapy. They intervened and initiated change if therapy was unsafe (drug, dose, strength, directions, interactions) and advised on safe, effective drug administration.

"I also see it as my job to ensure that the drug is used in the right way on the ward, that it is given at the appropriate rate, that it's actually given at the right rate. At the same time I monitor for side effects during their time on the drug". (Specialist Clinical Pharmacist)

Doctors saw prescription monitoring as an essential day-to day safety check (safety net) on prescribing that prevented doctors harming patients. Pharmacists ensured that the drug and dose were correct, no problematic interactions or adverse effects (potential and actual) were missed, prescriptions were unambiguous, legal and legible, and advice was

provided on adverse drug reactions (ADRs) and inadvisable combinations of drugs.

"There is a medicolegal aspect to it (ward pharmacy). *If something goes wrong the costs would pay for pharmacists for 50 years. It's something I'm very aware of but managers will be too soon"* (Consultant).
"There's a ward pharmacy system where they are particularly important for the more inexperienced doctors. They are a very important risk stop net, generally making sure there aren't any errors being made". (Clinical Director)

Ward pharmacy activities were also seen as providing medical education. Junior doctors valued ward pharmacy.

"It's nice they make sure you don't do something stupid. When you've been on for twenty eight hours you don't know what you're doing. Or worse, when patients come from A&E and we don't know what they're on or the dose. Pharmacy tells you when you've prescribed a completely wrong dose for them" (House Officer)

Consultants valued ward pharmacy's contribution to safety and the supervision of prescribing.

"House officers and SHOs (Senior House Officers, the grade above the House Officer grade) *- they need some kind of professional supervision really. The sort of supervision that's not*

provided by consultants. We mustn't allow the wrong drug or the wrong dose to be prescribed. We need to feel that someone knows enough about the clinical team to pick up on deviations from normal prescribing. If suddenly the dose shoots up the pharmacist will pick up on the mistake. " (Consultant)

All described the activity as a consultative one with discussions between doctors and pharmacists on the optimal choice of therapy for individual patients.

"At present there's a reasonable dialogue between us and the ward pharmacist. I can turn and ask an opinion of them on drug therapy" (Clinical Pharmacologist).

A minority of doctors felt that this service sometimes failed to detect inadequacies in prescribing and that there should be a better mechanism for assuring the quality of service.

Nurses valued the ward service highly as a quality assurance mechanism. They, like doctors, realised that the number of medicines had increased greatly in the past few years hence the need for expert help in using drugs safely. They also used ward pharmacists to ensure safety and optimal therapy by making inquiries about therapy that worried them.

"Pharmacists contribute to patient care in .. the way they contribute to safety massively in the organisation. They check prescription cards and challenge inadequacies and recommend changes if necessary. (Nurse Manager)

In a few cases, nurses mentioned their annoyance at having to contact doctors regarding questionable prescriptions because pharmacists did not do their job correctly. Nurses thought that the optimal use of medicines would be increased if pharmacists expanded their role in multidisciplinary teams and in direct patient care. They thought that pharmacists were not achieving their potential contribution in many areas.

"I think that there's a lot of knowledge and skills which aren't being used to their full potential". (Nurse Manager)

All managers were aware of pharmacists' contribution to risk reduction and improvement in the quality of care through the ward pharmacy service. They considered it key to maintaining prescribing standards especially amongst junior doctors.

"She checks individual charts and, on an on-going basis, she acts to improve education and communication with junior doctors so that standards are retained even though the doctors change every 6 months. " (Clinical Services Manager)

6.3.7.2.   Ward rounds.

Some pharmacists, and many doctors, nurses and managers, felt that pharmacists' participation in ward rounds helped optimise therapy and should be increased. Those with pharmacists on their rounds used this expertise almost automatically.

"Pharmacy were a very good addition to the ward round. I don't know why they stopped coming. I think they were busy doing other things. .. I'd like them on the ward round since they were a great source of advice". (Consultant)

The views of pharmacists about attending ward rounds were mixed. The arguments in favour of this activity were that it increased their knowledge of individual patient's needs and permitted judgement of the suitability of therapy. It allowed pharmacists to identify potential or existing problems, helped them decide on appropriate treatment, increased their knowledge of the disease state and permitted intervention at the point of prescribing to achieve change concurrently rather than retrospectively (which was though to be antagonistic and time consuming). Medical notes were thought to be grossly inadequate sources of information. The lack of a treatment plan in the notes increased pharmacists' difficulties in deciding if treatment was optimal.

"The ward round mainly helps me to know the patients, to get familiar with them. It increases my knowledge of psychiatric therapy and symptoms". (Specialist Pharmacist)

The arguments against participation in ward rounds were that it was a time-consuming activity, an inefficient use of time when it could be better spent in other activities, and that the desired information on patients and their problems could be obtained by other means, such as from ward staff or the notes. Those arguing against participation in ward rounds were often specialists who spent large amounts of time on the wards interacting with patients and staff.

6.3.7.3.   Other services.

Other services that were thought to help optimise therapy were pharmacists' participation in the creation and evaluation of drug policy, especially within directorates, the provision of advice (directly or via audit), drug information, and of medication history taking and TDM services. Many doctors would ask pharmacists directly for help in TDM and some thought pharmacists should manage this area of therapy. Specialists doctors held the opposite view and were content to adjust doses based on laboratory reports alone. Many pharmacists with limited TDM involvement wanted to develop the service, but were sometimes unable to do so because of lack of time or staff. A clinical pharmacologist thought that pharmacists' patient counselling and educational activities, especially in outpatient departments, could help detect ADRs and hence reduce the risks involved in the use of medicines. Some pharmacists said that it would be useful to be involved in assessing patients on admission to review therapy for ADRs, compliance and problems being experienced by patients. All interviewees thought that CIVAs optimised care.

"We get CIVAs from H (another hospital). *It saves time for doctors and nurses, reduces errors and hopefully increases patients' chances of getting efficacious treatment."* (Consultant)

6.3.8. Cost Control.

Cost control was seen as a major role for pharmacists. It was linked closely with several other functions, such as the creation of drug policies, the reduction of risk in medication use, the tailoring of drug therapy, the provision of financial and therapeutic information and advice, and with profit generation. Pharmacists felt often that they needed to use their ability to control and reduce drug expenditure to gain acceptance on ward teams and thereby begin to develop a more clinical role. Whereas pharmacists often spoke of cost control in terms of direct drug costs, other professionals took a broader view and also mentioned the effects of drug choice on staff and patient stay costs.

6.3.8.1.   Stock procurement and control.

All interviewees felt that pharmacists contributed to cost control by purchasing wisely, ensuring that stock holding was low, but adequate, and that wastage was minimised. A few pharmacy managers were concerned that the system of co-operative drug purchasing by consortia would be destroyed by trusts since none would be willing to pay for it. These pharmacists suggested that consortia cost be met by a charge for drugs (in addition to their cost). This costing strategy should, some felt, be extended to include products of the mini-industry that pre-packs drugs in smaller packs for hospital pharmacies. DTCs and formularies were seen as positive contributions to cost-control. Often, pharmacy provided financial information to help select drugs for purchase by the hospital. At a site where pharmacy services were contracted, decisions of this nature were made jointly with the directorates and were informed by pharmacy data on the probable effects on the directorate drug budget and contract price. Purchasers were approached for funding if the hospital could not pay for drugs within the terms of contracts.

"At the end of the day, the purchaser decides, if the product costs a lot, for example surfactant and it can't be covered for within the hospital, he decides if he pays for it." (Pharmacist)

6.3.8.2.   Provision of financial information.

Pharmacists thought that the provision of financial information to directorates and managers was an increasingly important role since it assisted in cost control. Many were improving information collection and provision using pharmacy computer systems and their experience as

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former managers of hospital drug budgets. Most pharmacy computer systems were, however, in need of upgrading.

"Our strength is we dispense drugs and it all goes through a computer system and we have the information. So outsiders aren't so much of a threat. With the new JAC (computer), information is produced in any way you want it. " (District Pharmaceutical Officer)

At a few sites, technicians or pharmacists had extensive knowledge of the computer system and were able to produce good quality reports easily but, in general, the lack of clerical support had hindered such provision. Forecasts provided by pharmacy were used in some hospitals to help with budgeting and to acquire extra funds from purchasers as treatment options changed. Doctors, nurses and managers commonly inquired about drug costs, best value in drug therapy and costs for particular therapies or for groups of patients. They identified a role for pharmacists in informing managers and directorates of the expected effects of novel therapies on drug budgets. Most valued this type of service.

"C (DI Pharmacist) has done a lot .. He produces factual information on a monthly basis on drug expenditure for the consultants with explanations of why people overspend. ... Whether or not they use it I don't know. At my level now I use pharmacy quite a lot and I get the response from them. I got them to do a talk at the medical meeting on drug use and prescribing and to make recommendations at consultant level". (Business Manager)

Several doctors said that pharmacy should provide information on the total cost associated with drug use, not just drug costs, and that more information should be provided to help improve prescribing.

"We have no feedback on why we use antibiotics for instance and no rationalisation and proper use of drugs. But doctors think they know best and hence there is mayhem. There's a computer system in pharmacy but it does not give us costs. It's an obvious areas where they (pharmacy) could do more" (Clinical Pharmacologist).

6.3.8.3.   Effective and economic use of drugs.

Some doctors and nurses, and all managers, felt that pharmacists' contribution to patient care was achieved partly by ensuring effective and economic drug use, thereby freeing resources for the treatment of others. This was achieved via the advisory services provided on ward rounds, during prescription monitoring, via audit, via the regular provision of information and by the creation of prescribing protocols based on comparative cost-effectiveness data. Some junior doctors said that it annoyed them when pharmacists intervened solely on cost. This harped back to an era when pharmacists "policed" the drug formulary to enforce it and may explain why some pharmacists were reluctant to seem overly concerned with costs. Most pharmacists agreed that they had a role in cost control. However, they tended to think only in terms of reducing the expenditure on drugs. Doctors wanted pharmacists to take a broader

economic perspective.

"Pharmacy does not, and should not, concentrate on cost only. Their approach to drug use and the time they spend in various activities should take overall morbidity and mortality associated with the use of drugs and health care into account. " (Senior Registrar)

Managers were supportive of pharmacy's role in improving the economic use of drugs by influencing prescribers. Most managers, like pharmacists, interpreted the cost control role narrowly in terms of money saved on drugs. Managers felt also that they needed pharmacists' help because managers lacked the knowledge of drugs and pharmacists had professional credibility with doctors.

"If I need to have a dialogue with clinicians about a drug, I wouldn't do it without C's (Chief Pharmacists') *help. She knows about the product, its cost and has done the research on the product's efficacy. They should have as much knowledge as the clinician. Their views are likely to be more objective and they can tell about the comparative effectiveness of products"* (General Manager)

In addition, the size of the drug budget, the difficulty that managers have in controlling it, problems in anticipating changes in drugs availability or use that will affect the drug budget, and predicting the effect of these changes, means that pharmacy service are being used increasingly and are valued. Doctors felt that this role was so important that pharmacy will survive, even if threatened by the NHS changes.

Drug information pharmacists felt that they could promote the economic use of medicines via their advisory service. Pharmacy managers at three sites said that DUR was useful in informing expenditure control policy. At one small hospital, ideas on the reduction of drug expenditure were proposed to hospital managers routinely. All pharmacies were increasing their input in cost control and economic use of medicines via clinical pharmacy activities and, at two sites, pharmacy managers that clinical pharmacy sought to increase the cost-effectiveness of therapy and to improve patient care, outcome, and quality of life. *"What pharmacists are doing now is ensuring cost effective prescribing. Clinical pharmacy is not there to give cheap drugs".* (District Pharmaceutical Officer)

6.3.8.4.   Formularies.

Formularies were considered to be successful mechanisms for drug expenditure control by all interviewees. It was pharmacy's role to ensure adherence to the formulary at all sites. Most wanted to maintain or increase pharmacists' involvement in monitoring and assuring adherence to the formulary. Pharmacists preferred to emphasise the therapeutic benefits to the patient from rational prescribing rather than the cost control aspect of formularies.

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6.3.8.5. Supply of CIVAs.

All interviewees were increasingly aware of the effect of pharmacy-prepared IVs in reducing the wastage of drugs and the inappropriate use of nurses' and doctors' time. Pharmacy had not, however, provided the service at several sites due to lack of facilities or funding. Non-pharmacists sometimes claimed that pharmacy had refused to provide the service without extra funds. There were counterclaims from pharmacy that managers, and medical and nursing staff, were unwilling to pay for the service. At sites with CIVAs, cost control had been used as a funding argument and this had been accepted.

"The CIVAs service has worked very well. It seems ridiculous to use all a vial when you don't use most of it and you end up wasting it. It's very popular on the ward. It's saved nursing time and nurses on the ward and reduced costs and increased quality by having the right dilutions. " (Clinical Director)

6.3.8.6. Profit generation schemes.

Clinical directors, managers and nurses at a small number of sites saw a role for pharmacy in profit generation for the hospital. This would be achieved through charges to private patients for their medicines, the sale of medicines in pharmacy shops and the sale of various products compounded in the pharmacy, such as TPN and IVAs. Most junior and middle-ranking pharmacists were unconcerned about the institution of such schemes. Senior pharmacy managers at two sites in particular had, however, used the profits generated from various schemes to fund pharmacy services or development (for example conference fees, costs of pharmacists' education and the start-up costs of new services). These managers were concerned that the new profit-making schemes would result in the exploitation of pharmacy by managers with consequent disbenefits for pharmacy staff. Although pharmacy had, in the past, contributed a proportion of the profits to the hospital, pharmacy managers feared that greater pressure would be placed on pharmacy staff from such new profit-making schemes or that pharmacy would be required to use the profits to finance their services.

6.3.8.7. The directorate service.

The role of the directorate pharmacist has evolved into one involving the control of drug expenditure and the assurance of rational and effective prescribing. Pharmacists had assumed this role willingly and provided information on drug use and costs, ensured therapy was cost-effective and suggested economically advantageous uses of drugs to directorates. The directorate system had facilitated the integration of pharmacists with ward teams since it placed greater emphasis on financial aspects of patient care and drug use and allowed them to

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demonstrate their contribution.

"It's easier to go and intervene with rational therapy now, not just intervening on costs, as long as you can say the treatment is as good. If not, you have to put in for extra funding or save elsewhere. You still have to present a rational argument. They (doctors) don't want to affect patient therapy just on cost. Two years ago they wouldn't even have considered it. Now they will but not solely on cost" (Specialist Pharmacist).

Directorates recognised pharmacists' role in monitoring and controlling drug expenditure. At one site contracts were agreed with some directorates on the understanding that the pharmacist would save the directorate money.

"Pharmacy came to us and said that clinical pharmacy would improve prescribing. In practical terms that it would save money and improve prescribing. I was very sceptical. If they could save me what they cost me and there were other benefits then I said yes, I'd buy the service. They've always done that especially by targeting expensive drugs. They've suggested prescribing guidelines for these and for cheaper drugs also." (Clinical Director)

Clinical directors were very positive about pharmacists' assistance in cost control, achieved through the development of policies and by the provision of advice on individual patient's therapy, and would like more of these services. They, and managers, expected that the least cost alternative would be recommended to prescribers. Several doctors felt that pharmacists should initiate the provision of information and assistance rather that waiting to be asked. In contrast, pharmacists thought that directorates frequently did not know what information they required so they awaited requests and were conservative in providing advice about cost control.

The pharmacists' role in cost control at the directorate level was dependent on directorates' needs. The amount and frequency with which information was provided varied and was decided upon by the directorate pharmacist in most cases (or within the terms of a contract). At one site, some directorates expected pharmacy help in cost control only if there was a financial problem.

"I work on the basis of if there's a problem we look at it. The problem is that we're not that pro-active. If there is an overspend we look at it. We don't have time to be pro-active." (Directorate Business Manager)

Nurses said that directorate pharmacists helped them cost medicines and other items. They would like pharmacists to be more involved in making choices on medicines based on monetary data.

6.3.8.8.   Informing contracting.

Clinical directors and managers at some sites envisaged a role for pharmacists in informing hospital contracts by providing information on the costs of drugs for specific procedures.

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Some managers thought that pharmacy could tailor its service to the overall organisational objectives, including initiatives to help the hospital satisfy contracts, and develop new services in discussion with top managers.

"It's better if people come up with the ideas and I guide them through the business planning and how it fits the administrative objectives of the unit. " (General Manager)

At one site, pharmacists took the attitude that everything they did was driven by the requirements of their internal customers, which in turn were driven by the external purchasers' contracts. Several pharmacists envisaged a need to provide information for internal contracts between pharmacy and the directorates but this was happening only at one site. At many sites, however, pharmacists and non-pharmacists had not started to consider the process of internal contacting and had not considered a role for pharmacists in informing external contracts.

6.3.9. Education and Empowerment of Patients.

Pharmacists were involved in the education of a wide variety of patients, for example cardiac rehabilitation patients and those receiving post-operative pain relief and home IVs. The style and amount of patient education varied. The groups of patients chosen depended on local interest, such as multidisciplinary initiatives, local consultant and nursing interests, or the interest of a specialist pharmacist. Pharmacists said that they would like to increase their activity in this area, especially at discharge and in outpatient and day care clinics. Some were interested in writing more PILs. They though that these activities would help increase adherence but often felt unable to become involved due to prior commitments, workload and general lack of time.

Some sites routinely provided counselling for some or all out-patients, frequently using technicians as well as pharmacists. Specialist pharmacists provided services for selected groups, such as diabetics and those on home TPN. Other sites provided the service on an ad-hoc basis and out-patients frequently received no education. Pharmacists and nurses felt that poor pharmacy facilities for patient counselling interfered with service provision.

"It can't be good to tell people about their medicines through a hatch. If there were more patient information leaflets people could read them as they waited sitting in the waiting area. It would educate patients and fill a need". (Ward Sister)

Pharmacists also mentioned that their lack of information about patients (due to poor hospital information systems) hampered counselling by dispensary staff. Managers viewed patient

education as an expert contributing to patient care in a very important area since it could help increase the proper use of medicines. They strongly supported the provision of patient education by pharmacy yet none suggested ways of financing the service.

6.3.9.1.   In-patient counselling.

In-patient counselling was provided routinely by pharmacy at some sites but usually for specific groups of patients, such as the elderly. At other sites counselling was provided by nurses. In a few sites it was hardly provided at all. Some pharmacists were trying to increase their bedside contact with patients and others were actively pursuing involvement in admission and discharge schemes. There were efforts to obtain PILs in cases where pharmacists were unable to spend time educating patients. Pharmacists disagreed on the provision of counselling for all or only selected patients and also on who should provide it. Lack of time, poor technician support and difficulties in proving the service was useful formed barriers to its provision.

"We're not exceptionally (bad) with respect to patient counselling. It's difficult to identify a payback for that service. You can argue that it may prevent re-admissions. We can measure the savings on IVs, nursing time in ITU (Intensive Care Unit) etc for the CIVAs. It's an easier service to sell". (Clinical Pharmacy Manager)

"All the sorts of stuff they (theorists in clinical pharmacy) tell you to do like inhaler counselling, we don't do. Why don't we? Quite often they (patients) are acutely ill. They don't want to and we are not able to spend time telling them about their drugs. They may be off them. It's a cop out clause really". (Clinical Pharmacy Manager)

"I have a vision of using the technicians for counselling. There's a lot more technicians can do. I have worked with good technicians and it makes a big difference. They're (the technicians at this site) severely limited in what they can do and in forward thinking". (Specialist Pharmacist)

Technicians were, however, involved in counselling at some sites and were keen to expand the service.

"I'd like to see more patient counselling and patient contact on the wards. The technicians could take it on if we got time." (Chief Technician).

Pharmacists said that in-patient counselling was often shared with nurses and nurse specialists due to pharmacists having insufficient time to provide the service. Pharmacists sometimes helped to create protocols and educated nurses to facilitate the provision of a high quality service. Most pharmacists were happy for nurses to provide education, but this was often dependent on nurses being highly knowledgeable or the counselling being a co-operative venture with pharmacy. Role sharing was uncomfortable for some pharmacists.

"With the overlapping roles I thought it was a difficult situation. I prepare the drugs and know a lot about the funny side effects of all the drugs but who should counsel the patients? I'm a pharmacist, I thought, and I know the drugs. They're nurses and they know the patients. We

agreed that it was better they did it since they've got more contact with the patients. They did find it threatening at first but we all sat down and worked out our roles. It was a certain amount frustrating for me since I know nurses have not got a very science based education. " (Specialist Pharmacist)

Patients who overheard pharmacists educating other patients were more likely to ask questions about their own medicines. Hence the provision of the service was thought likely to stimulate its use.

Most nurses thought that patient education was a basic pharmacy service that contributed to patient care. They felt that more should be provided and that the information that was given to patients should be relevant and easily assimilated.

"They should make the .. information that they provide easy to understand and relevant. As a ward sister, I'd hate to think of anyone going out of hospital and not understanding their medicines". (Ward Sister)

Nurses envisaged pharmacists having a major role in patient education in the future by being more available for discussion with patients on the wards and elsewhere. Many felt that pharmacists spent insufficient time on the wards and identified the interaction with patients during routine prescription monitoring as an ideal opportunity for providing education. There was no opposition from nurses to pharmacists providing education in this way and the lack of development of the service depended entirely on the lack of pharmacy effort and of resources. Nurses' lack of initiative in inviting pharmacists to become more involved was also mentioned as a factor by some nurses as was the current rapidity, and disorganisation, of patient discharge. Where pharmacy was educating patients, nurse managers thought it had contributed to patient care. A few nurses, however, thought it was exclusively a nursing role to educate patients. These were older nurses or nurse managers and their subordinates often took the opposite view. At two sites, however, this opposition had prevented or delayed pharmacy providing education to patients cared for by nurse specialists. Most nurses thought that the educational role could be shared and, due to perceptions of their own lack of knowledge, preferred if pharmacy provided education for patients receiving more complex therapies. Nurses, however, often ended up providing the education due to lack of pharmacist time.

"Our pharmacist has not got enough time for patient education. Pharmacists don't ignore patients but I'd like them to have a greater input in patient care and understanding of drugs. We're looking at self-medication here. ... We cannot do it without the pharmacy's input. I think that the pharmacists should be available to talk to patients. Nurses and doctors are both poor at that. Nurses don't have the knowledge. If the patient asks questions the nurses don't and can't be expected to have the knowledge to answer them. " (Nurse Manager)

"Patient education. That's probably one of the things we could do more of. She (pharmacist) doesn't have much time to talk to patients about TTOs. Nurses are still involved and talk to the patient about them. Some nurses are probably unhappy to do this. I think it's time is the issue,

the lack of it. With the turnover here A (pharmacist) *doesn't get time to do it. It is an area where the nurses feel they're very lacking in knowledge. They'd feel happier if A did it rather than them. For any specific patient with real problems she does it anyway. "* (Nurse)

Nurses were anxious also to be educated by pharmacy on the provision of education for patients. At one site nurses checked with pharmacy that a patient collecting their own medicines to take home would be counselled. This annoyed pharmacy technicians but clearly shows that nurse do not take pharmacy provision of discharge counselling for granted.

Medical staff and managers felt that pharmacy had a major role in patient education. They valued the service where it was provided. Only some realised that many patients were not receiving the service at present. Many thought counselling should be available to all patients and a number thought that pharmacists could co-operate with nurses to ensure this by training nurses to counsel and to identify patients to refer to pharmacists.

"With drug counselling each nurse could do it for the common ones but refer for the specialist drugs. The person who counsels will have to talk to the team to find out what their (the patient's) *cognitive skills are. They should target their counselling on patients with the ability and taking their health beliefs into account. Pharmacists can help only so much. If the pharmacist is attached to the ward as a counsellor they will have to put a lot in initially but if it's a stable ward they're catalysts. They help others to care. We can't afford a pharmacist for every patient. They should ensure that the nurse knows when to refer up. "* (Consultant)

Pharmacists were considered to be very knowledgeable about medicines and could educate patients about the manner in which drugs worked to improve compliance.

"Their other role is patient education. Hopefully they have more time .. to spend time with patients to educate them to improve compliance. " (Senior Registrar)

Patients on polytherapy, the elderly, those experiencing difficulties with medication, and those on home parenteral medication and inhalers were thought to be especially in need of education. Many doctors, but clinical directors in particular, identified the ward pharmacy service as an ideal opportunity for in-patient education that pharmacists were not using because they spent insufficient time on the wards. Several doctors said that they would like to target the service for development since it improved the quality of care.

"An area I think should be looked at more by pharmacy is discharge medication. I have the feeling that it's not looked after properly. It's one of my hobby horses. I've asked the pharmacist to do a little study on it. The self-medication scheme is part of it. I feel that patients are sent home on too many or on unnecessary drugs. There's a big area that needs attention. That's discharge. Patients are given a bag of bottles and waved goodbye. Even the young intelligent ones get mixed up with their drugs after a few weeks never mind the older ones or those who can't read the labels. It's one area where pharmacists could get involved very much. " (Consultant)

6.3.9.2.   Out-patient counselling.

Some doctors mentioned the relative absence of pharmacists from outpatient clinics, and the lack of education for out-patients, as problems but felt that these were due to a lack of resources. A clinical pharmacologist felt that pharmacy did not want to invest resources in the services since they perceived no financial return for pharmacy. He now used nurses to provide the service.

"With counselling. I've looked towards specialist nurses to do it not pharmacy. Pharmacy just wasn't interested." (Clinical Pharmacologist)

A few doctors were opposed to pharmacists counselling patients, one because it was a nursing and medical role and the others because it might interfere with the well-established holistic care of patients that was being provided by nurses. Nurses thought that pharmacists should provide education for out-patients and educational material in patient waiting areas. One nurse was pursuing the idea of a pharmacy drop-in clinic for the provision of discharge counselling. Another thought that pharmacists should become more involved in health promotion if they had the time. When questioned directly, most pharmacists thought that they should provide counselling for out-patients. Many, however, felt unable to increase the present low level of service due to resource constraints.

6.3.9.3.   Schemes to empower patients to take medicines appropriately.

Pharmacy and non-pharmacy health care professionals were keen to promote schemes that increased patients' knowledge of medicines and enabled them to manage them better.

"The next major area of opportunity is discharge planning and quality, how to get across the idea that patient's don't go from being incompetent one minute to competent the next on dealing with their medicines. That encompasses the whole area of counselling and patients knowing how to use medicines" (Business Manager, Support Services Directorate)

It was also seen, by some nurses, as addressing patients' rights.

"I'd like patients to self-medicate. That's something that was proposed to the pharmacy department but they thought that it would be too expensive. I feel it's something we have to look at in the future. To a degree, patients are treated like babies here. When we see it from the patient's point of view we're annoyed. That's where we have to move forward to self-administration for patients. Patients do need to be involved with their care. It addresses patients' charter rights and patient autonomy." (Nurse)

Pharmacists were thought to have key organisational and educational roles in self-medication (administration) programmes and many pharmacists wanted to be involved. At several sites pharmacists were helping to set up and run programs with nursing staff, particularly for care of the elderly or chronically ill patients. Some doctors and pharmacists were eager to increase communication between hospital pharmacists and patients following discharge to improve the

follow-up of patients. Pharmacy managers realised that their involvement in this area was not optimal.

"I do think we've handled things about moving patients in and out of hospital badly. What happens at the end is we think they are boring and we want a brand new interesting patient like the doctors, yet that is the most important time for the patient. " (Chief Pharmacist)

There was some confusion regarding nursing and pharmacy roles in self-medication schemes. A minority of nurses saw little role for pharmacists. Lack of pharmacist time was recognised as a barrier by nurses and pharmacists. Nurses also felt that the capital cost of the scheme was an impediment. Some nurses thought that patients may be unaware of pharmacists' roles and hence did not avail of pharmacists' advice. They felt that this could be remedied by pharmacists' involvement in self-medication schemes and the provision of written and verbal information on pharmacy roles.

"The self-medication scheme would promote their image with the patient as well and would reinforce what they do .. I would reinforce their role" (Nurse)

6.3.10. Roles at the Primary-secondary Care Interface.

The extent of development of hospital pharmacy roles in primary care was mixed. Sometimes, responsibility for this area rested with pharmacists employed by a community or priority care trust that was distinct from the acute care trust that had formerly held the responsibility. Community services pharmacists (CSPs) were heavily involved in this area. The role of CSPs has developed over the last decade or so. They were hospital pharmacists who were employed to provide services to health authority clinics, such as child care and vaccine clinics, and to act as a source of pharmaceutical advice for health authority employees working in primary care. The priority care trust usually employed a number of CSPs whereas non-trust sites employed a single CSP who was sometimes assisted by others. This resulted in a less focused and less comprehensive approach at non-trust sites.

CSPs were developing services with an awareness of changes in funding of primary care. At a site with highly specialised clinical pharmacists, the CSP thought that services to primary care should develop along similar lines to clinical hospital pharmacy with various specialists developing as necessary. Some CSP functions were thought to be within the remit of Family Health Service Authorities (FHSAs) (for example inspection of some institutions) and a reorganisation of FHSA/Trust responsibilities was thought to be necessary to ensure the

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efficient and responsive provision of service.

"What I'd like to see develop is the same structure in the FHSA to that in hospital (pharmacy). So many different issues - some services need to be run by the FHSA. CSP type services should be dealt with by the FHSA Pharmaceutical Advisor. Inspections of nursing homes should be done with the FHSA, and residential homes with social services. There are so many different branches of pharmacy in CSP. .. All it needs is reorganisation. " (Community Services Pharmacist)

The main barriers to the increased provision of services in primary care and at the interface were resources and pharmacy attitudes. Due to lack of numbers, CSPs limited their activities to the support of other health professionals. Few were able to become as involved in their work, particularly with patients and carers, as they would wish.

"My contribution is via support for staff (health authority staff). By making the environment safer for patients " (Community Services Pharmacist)

The lack of numbers was due to pharmacy managers' concentration on developments in secondary care and the relative novelty of the CSP role. CSPs felt that their services were invisible both within pharmacy and to other professionals. Some CSPs were reluctant to act assertively and to develop services or question the activities of other professions. In general, hospital pharmacists ignored interface or primary care issues except where current events demanded otherwise, for example pharmacy involvement in pharmaceutical discharge, self-medication schemes and hospital at home initiatives. Then, the focus was on groups of in-patients with particular acute needs rather than on all patients crossing the interface.

A few pharmacy managers had recently started to focus on interface and primary care issues and had developed services as a result. Often this was due to a general hospital trend to increase services to primary care. There was growing awareness that the movement to primary care was on the political agenda and that funds were shifting towards it thereby offering opportunities to well-trained hospital pharmacists.

"Pharmacists have got to be politically astute, to learn to adapt, to spot where priorities lie like the move to primary care at the moment. .. To follow through patients to the community. It's very important because patients are being treated at home. C (chief pharmacist) is very involved in a scheme to keep children there, out of hospital. We're faced with the quality issue of patients at home receiving drugs. They need support. ... There's no reason why we, or community pharmacists won't get money from purchasers to fill the gap". (District Pharmaceutical Officer)

Some hospital pharmacy managers were making efforts to acquire funds for CSP-type services. The absence of community pharmacy involvement in the area, and the potential for payment for services by purchasers, were incentives to hospital pharmacy involvement. Some

pharmacists thought that community pharmacists were inadequately trained and poorly equipped to provide these services.

Pharmacists working as pharmaceutical or prescribing advisors realised that they were uniquely qualified to advise GPs on good prescribing. This was seen as a large area of opportunity since the reduction in primary care prescribing expenditure was high on the government's agenda. Where advisors were hospital pharmacists, their lack of experience in primary care worried them and was recognised as a potential cause of friction with GPs and community pharmacists. To counter this, these pharmacists sometimes forged close alliances with FHSA medical advisors and frequently carried out joint visits to the GP practices to increase their acceptability amongst GPs. One CSP felt that her community pharmacy experience increased her acceptability to an FHSA that had been antagonised previously by a hospital pharmacist. No advisor indicated that their advice had been rejected by GPs. Although pharmacists said that they tried not to act as "prescribing policemen", many saw their ability to contribute to drug budget control as a major factor increasing their acceptability to GPs and FHSAs. The existence of separate drug budgets for primary and secondary care had been a source of some ill-feeling between hospitals and GPs and created potential negative effects on patient care.

There were barriers in primary care to pharmacy service developments. Pharmacists felt that hospital pharmacy has had a low profile in primary care and potential recipients of their services needed greater knowledge of what was available. Lack of pharmacy involvement in primary care and at the interface meant that other groups, such as nurses and occupational therapists, had stepped in to provide some services, and doctors and nurses felt that there was no need for pharmacy to become involved now. It was noted that most primary care roles were those that CSPs or other hospital pharmacists felt should be adopted; non-pharmacy professionals rarely mentioned any roles.

6.3.10.1.   Provision of drugs.

A limited number of drugs were supplied to primary care, such as vaccines, products that were not easily obtainable in primary care from community pharmacies and drugs supplied to health clinics. Some specialised therapies were provided by commercial companies, such as TPN and dialysis fluids, but in line with hospital pharmacy guidance. Pharmacists were beginning to identify new opportunities for supply, for example TPN to AIDs patients.

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6.3.10.2.   Provision of drug information.

Hospital pharmacists working at the interface thought that their knowledge of drugs was valuable and comprehensive.

"I have a better knowledge of the range of drugs. That's what I can offer above the GP reps (pharmaceutical company representatives)". (Pharmaceutical Advisor)

CSPs spoke of their role in providing information to, and supporting, health authority employees. They sometimes provided information under contract to those working in primary care, provided written information to primary care institutions, including regular drug updates, advertised the presence of the local hospital DIC and provided information on policies, such as wound care and head lice. The supply of information was seen as a growth area. One DIC was under contract to provide new product appraisals to GPs as part of the indicative prescribing initiative.

"A couple of years ago we got money for a FHSA service. That is only in part to do with answering inquiries from community, GPs and practice nurses. ... it's to support the indicative prescribing initiatives." (Drug Information Pharmacist)

6.3.10.3.   Therapeutic advice.

Pharmacists working at the interface provided advice on individual patient's therapy, for example on wound care, usually to primary care institutions (nursing and residential homes, day centres, mother and baby and family planning clinics, and learning disabilities, mental health and children's institutions), and to professionals (chiropodists, dentists, GPs, health authority staff, other primary care workers, and community and school nurses).

"We'd like to look at rationalisation of prescribing in nursing homes. We look closely at patient care in nursing homes. It's probably one of the areas where we do influence patient care. We look at the prescription and advise GPs on changes. We look at wound management with nurses in nursing homes." (Community Services Pharmacist)

Although they had little direct patient contact, they fulfilled a caring role by acting as team members and advising and educating other professionals and hence improving other professionals' ability to care for patients. They also reduced the inefficient use of these professionals time by answering questions on drug therapy. The historical CSP role of inspecting residential and nursing homes was thought to have facilitated the provision of advice on drug therapy to GPs caring for patients in these homes.

6.3.10.4.   Inspection.

Some CSPs inspected residential and nursing homes for registration under contract to health and local authorities. This is a role that CSPs had adopted several years ago.

6.3.10.5.   Optimising therapy.

Many CSPs advised on therapy and policy but few considered that they helped optimise therapy. One CSP said that she did this by providing ward pharmacy to institutions. Another felt that her contribution to the rational use of medicines by GPs enabled more patients to be treated. A CSP at a site with specialist clinical pharmacists liked to visit patients and their carers to monitor therapy but was often unable to do this so often due to lack of time.

6.3.10.6.   Patient counselling and education.

CSPs educated and counselled patients, particularly those in primary care institutions, but it was a role reserved for patients with particular difficulties. Most CSPs were content only to educate other professionals to provide the services.

"District nurses often ring me up and tell me if patients are not coping with their medicines and I would go and assess them and talk to them. I do domiciliary visits to primary referrals from district nurses and GPs. " (Community Services Pharmacist).

Some felt that community pharmacists should provide counselling to patients in homes.

"I know a lot of people say it's the role of the community pharmacist. In an ideal world it would be but I'm aware it isn't going on and there's not an integrated domiciliary visiting service in community pharmacy in the UK. I've tried to get community pharmacists involved but it's not worked. I understand their pressures. " (Community Services Pharmacist).

6.3.10.7.   Education of health care professionals and primary care workers.

Education was provided for nurses, family planning clinic workers, occupational therapists, residential home staff and groups such as MenCap. Many CSPs felt it was the most effective way in which their knowledge could be used to influence patient care. One said that it helped to make the environment safer for patients. Another saw this as one of her most important and necessary roles.

"I'm involved in training of community staff, district nurses, family practice nurses or whoever deals with medications. It's very much a passive role. They say 'Could you fit this in'. We could go seek training needs when we have better staff numbers here. In a way I'd say I'm like a specialist support service to staff working in the community. Not just the primary health care team but more the health authority community unit staff. I provide less support to GPs. It's more focused in on staff like district nurses, chiropodists, dentists, family planning staff. I link in with them. So very much is on advice, information, training, policy making. My domiciliary visiting role is my only real patient contact area but I still link in very much with patient care by providing useful services to people dealing with patients like district nurses training courses and so on. " (Community Services Pharmacist).

6.3.10.8.   Creation of drug policy.

Hospital pharmacists were involved in creating protocols for training patients and assessing

their proficiency in drug administration prior to discharge. Managers and doctors thought that they could help rationalise GP prescribing and increase concordance between hospital and primary care formularies.

"Primary health care is using a greater share of the budget but we've no control over it at the moment. We've no control over the increasing demands as fundholding GPs increase. The GPs can basically order what they want. We've got to work with the purchasers to control them. The Pharmaceutical Advisor does something but I don't know how much of his time and energy he's spending trying to persuade and advise them to change their prescribing patterns". (General Manager)

CSPs wanted to increase CSPs', FHSA Pharmaceutical Advisors' and GPs' input into hospital drug policies by increasing their participation in DTCs.

"We're setting up an area DTC to tackle the area between primary and secondary health care". (Community Services Pharmacist)

One DIC was involved in creating prescribing policies and formularies with GPs. CSPs assisted in the creation of various emergency, wound management, head lice and other policies with primary care professionals and institutions. Some CSPs involved FHSA pharmacists in creating policies to co-ordinate treatment in secondary and primary care. One barrier to team care across the interface was thought to be GPs' reluctance to become involved in shared care.

"GPs here are not so interested in shared care. GPs are nervous about prescribing for patients on high tech therapy". (Community Services Pharmacist)

6.3.10.9.   Team care.

Many CSPs thought that they should become involved in discharge planning, possibly in co-operation with FHSA advisors. It was viewed as a new opportunity that could be taken only if other hospital pharmacists became involved. Some CSPs may be obstructing community pharmacists' involvement in discharge because they feel that they have lower standards of confidentiality than hospital pharmacists. Several doctors wanted hospital pharmacists to provide information on discharge medications to GPs, or to the referring institution, to improve the quality of care. A nurse said that this would ensure the continuity of care and was central to pharmacists' duties. Other areas for attention were drug misuse and elderly care clinics, and AIDS, children's and women's services.

6.3.10.10.   Facilitators of community pharmacy development.

A few CSPs thought that they should increase the involvement of community pharmacists in the provision of more services by educating them and by facilitating communication with GPs. One CSP was informing primary care professionals and workers about the services provided

by community pharmacies. Some CSPs mentioned liaison with community pharmacists as an important role in improving the communication between hospital and community pharmacists.

6.3.11. Prescribing Within Protocols.

Pharmacists prescribed within protocols at a few sites, mainly for TPN and cytotoxics. This was with the consent, and under the direction, of consultants who retained overall responsibility for patient care. Senior doctors thought that specialist pharmacists could prescribe within protocols or in specific areas where doctors lacked expertise. Junior doctors welcomed this service and some envisaged its extension to other areas.

"With TPN we just give them the IV results and they do it. It's very useful. They tell you what to prescribe. I'm ignorant of that type of stuff" (House Officer)

"With gentamicin, nobody thinks about it. So there's no reason why pharmacy can't do it. They could write the blood forms and even take the bloods. There's no reason why they can't change the prescription as well. They're interested in it and know what they're doing. With fluid management, I think some overall supervision is useful, someone comparing the U&E's with the fluids prescribed. House officers and SHOs don't write up fluids often enough for them to be knowledgeable enough about it. On-call, then, they just write-up anything they want but they don't really think about it. " (Senior House Officer)

Most doctors were resistant to pharmacists taking on a general prescribing role. They felt that prescribing decisions rested with doctors and contributions must be made in a team framework.

"It has to be clear that the responsibility is the doctor's since the doctors ultimately do the prescribing. I don't think you can have more than one person taking responsibility for that. There's lots of room for pharmacists to become more involved with the decision-making process. I don't think they can understand patient issues to the same extent as doctors do. The person who takes the history must know more. " (Clinical Director)

A few pharmacists said that they would like to prescribe within protocols. A pharmacist, who was likely to start providing this service in the near future, was concerned that her ability to provide the service would be restricted due to her enforced absence from ward rounds (due to their unpredictability) and the impossibility of getting good information from incomplete medical notes. Were these problems remedied, she would happily prescribe.

"The new (next) clinical director would like me to do the prescribing but I can't do it because I don't know all the facts and they're not in the notes. So I don't have the information to prescribe. If we had protocols I'd do it but not if we haven't good doctors notes and protocols. " (Specialist Pharmacist)

Some pharmacists were resistant to prescribing because of potential conflicts with doctors.

"I'm not in favour of pharmacists prescribing. There's too much conflict. It's the responsibility thing - who takes it at the end of the line. And what happens if the doctor wanted to prescribe

something and didn't want to prescribe the thing that you had prescribed". (Specialist Clinical Pharmacist)

These issues of interprofessional relations are further explored in Chapter VIII and IX.

6.3.12.   Maintenance of Records of Pharmacy Activities.

Pharmacists often recorded prescription-monitoring activities in pharmacy. At one site they were starting to record their input in educating in-patients in the notes. Doctors welcomed it.

"They are just introducing a system here where they write in the notes about their interaction with the patients. In the old system, one of my criticisms about their interactions is we didn't know if they did it. I'd get information if I wanted it but I didn't know what was normally done with patients. Writing it in the notes, that came from a prescribing audit. I suspect it was welcomed by doctors and, from what I know, it was. If they had an interaction with the patients then they could write it in the patients' notes like if they explained the side effects of drugs. It has quite a useful medicolegal aspect. It's very useful for us to know what the patient has been told." (Senior Registrar)

Doctors felt also that it showed patients the importance of the pharmacist's role.

"I've no objection to pharmacists writing in the notes. All the people I have in the clinic, they all write in the notes, what they have done. They have to come off the fence and say what they have done. Patients and others then see the relevance of what they are doing." (Clinical Pharmacologist)

Although some pharmacists were keen to assume this role, others were anxious about its medicolegal implications. Pharmacy managers saw its advantages.

"When pharmacists intervene it should be recorded in the notes. I think it should be done. It's our responsibility if we are intervening. ... If we do intervene there should be evidence. In clinical audit you ought to be able to see pharmacists' interventions. It should be transparent. Why should we be paranoid." (District Pharmaceutical Officer).

6.3.13.   Management of Pharmacy Staff, Resources and Services.

The Pharmaceutical Society was not seen as providing leadership or developing strategy. Pharmacy strategy development was the DPhO's and, at some sites, the chief pharmacist's role. Chief Pharmacists and their middle managers managed the service and led it through the NHS changes. They had responsibility for organising services on a day-to-day basis, promoting services to customers, co-ordinating staff and services, and addressing issues of skill-mix, education and training, and staff self-development. At sites with directorate pharmacists, much routine service management was their responsibility. Senior managers co-ordinated the various pharmacy support, supply and clinical services. Services were usually financed by central hospital funds but, at one site, clinical pharmacy services were financed by

contracts with directorates.

The management of pharmacy strategy, staff, resources and services were key roles. Doctors, managers and pharmacists thought that pharmacy should manage its own affairs. The quality of pharmacy management, however, had profound implications for the service and staff. This is addressed in Chapter VIII.

6.4. Limitations of the Interview Survey.

This study was carried out at eight sites chosen on the basis that they possessed some of the factors that had been shown to be important in the questionnaire survey and because they had other theoretically relevant characteristics. These sites were felt to embody the range of factors that were important to the development of clinical pharmacy. Whilst the results are considered to be representative of clinical pharmacy in UK NHS hospitals, it cannot be claimed that they are statistically representative. There was a potential for bias since the contact pharmacist at each site helped select interviewees. This factor was, however, considered to be unimportant since the interviewer retained a large degree of freedom in selecting interviewees. Interviewee knowledge, in some cases, that the interviewer was a pharmacist was unavoidable and may have been a potential, although relatively minor, source of bias. The decision not to tape-record interviews may be criticised as limiting the scope for making verbatim records but it was considered that data validity remained unaffected and it may have encouraged some interviewees to speak more freely.

6.5. Summary - The Clinical Roles envisaged for Pharmacists, the Services stemming from them and the extent to which Agreement existed on these.

Many of the roles performed by UK NHS hospital pharmacists are recognised and perceived to be appropriate by themselves and by non-pharmacy health professionals. Although the interviews focused on the clinically- or patient-orientated roles, many interviewees, especially non-pharmacists, mentioned the supply role. Pharmacists also acknowledged that this was a core role that underpinned their other services. Interviewees spoke of many of the more established clinical roles, such as the provision of therapeutic advice, and the services that were thought to fulfil these roles, such as ward pharmacy. They also mentioned newer roles and services, such as the extension of activities into primary care. There was unanimity within

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pharmacy and with non pharmacists on certain roles and services, such as the provision of information, but disagreement regarding others. In particular, there was disagreement within pharmacy on the control of drug levels on the wards, the provision of education for doctors, the participation in ward rounds, the provision of out-of hours services and prescribing. There was disagreement between pharmacy and nursing on the education and empowerment of patients and between pharmacy and medicine on the provision of TDM and prescribing. The roles, the services that they include and the extent to which agreement existed about them are summarised in Table 6.3. The most striking feature of the table is its length and the extent to which agreement existed on roles. Clearly, pharmacists are considered to have a large potential role in the provision of health care.

The next chapter will set the evidence presented in this chapter, which reflects health professionals' perceptions of pharmacists' roles and their value, in context by comparing it with data obtained earlier in the research, namely evidence of the widespread performance of various roles (questionnaire data) and evidence of their effectiveness (literature data). This triangulation of evidence will facilitate the comprehensive description of the present and future clinical role of hospital pharmacists in the UK NHS.

Table 6.3. UK NHS hospital health professionals' perceptions of hospital pharmacists' roles and the extent of agreement on these roles.

Role	Service	Extent of Agreement[1]			
		Pharmacists	Nurses	Doctors	Managers
Supply of medicines	Purchase & distribution	+	+	+	+
	Control on wards	±	+	+	±
	Supply - In-patients	+	+	+	+
	Supply - Out-patients	+	+	+	+
	IVAs[2]	+	±	+	+
	Trial medication	+	+	+	+
	Out-of-hours supply	±	+	±	O
Drug information	Information networks	+	O	O	O
	Within hospital	+	+	+	+
	Out-of-hours	+	+	+	+
Education	Pharmacists	+	O	+	O
	Pharmacy technicians	+	O	O	O
	Doctors	±	+	+	+
	Nurses	+	+	+	+
	Other health workers	?	O	?	O
Research	Practice research	+	O	+	O
	Clinical trials	+	+	+	+
	Multidisciplinary research	±	+	+	+
Therapeutic advisor	Drug policy				
	Creation	+	+	+	+
	Implementation	+	+	+	+
	Assessment	±	?	+	?
	Individual patients				
	Ward rounds	±	±	±	±
	Ward pharmacy	+	+	+	+
	Out-of-hours	±	+	+	O
	Team services	+	+	+	+
Optimise medicine use	Ward pharmacy	+	+	+	+
	Ward rounds	±	+	+	+
	TDM[3]	+	O	±	O
Cost control	Stock procurement and control	+	+	+	+
	Provision of financial information	+	+	+	+
	Ensuring effective & economic drug use[4]	+	+	+	+

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Table 6.3.   continued.

Role	Service	Extent of Agreement[1]			
		Pharmacists	Nurses	Doctors	Managers
Cost control	Formularies	+	+	+	+
	IVAs[2]	?	?	?	?
	Profit generation	±	+	+	+
	Directorate work	+	+	+	+
	Informing contracts	?	O	?	?
Patient education and empowerment	In-patient counselling	±	±	±	±
	Out-patient counselling	+	+	±	O
	Self-medication schemes[5]	+	±	+	+
Primary care	Supply	+	O	O	O
	Drug information	+	O	+	O
	Therapeutic advisor	+	O	O	O
	Inspection	+	O	O	O
	Optimise therapy	+	O	O	O
	Patient counselling	+	O	O	O
	Education of health workers	+	O	O	O
	Advisor on drug policy	+	O	+	+
	Team care	±	+	+	O
	Community pharmacy development	+	O	O	O
Prescribing	General	±	O	±	O
	Limited (TPN[6], cytotoxics)	+	O	+	O
Record activities	Medical notes	±	O	+	O
Management	Staff and services	+	O	+	+

Notes to Table 6.3:
1. Extent of agreement is coded as follows;
   + Complete agreement   ± Some disagreement
   — Complete disagreement   O No opinion expressed on role
   ? Weak positive opinion expressed on role
2. Intravenous additives;
3. Therapeutic Drug Monitoring;
4. Using the advisory service on ward rounds and ward pharmacy and by implementation of policy;
5. Also known as self-administration schemes;
6. Total Parenteral Nutrition.

CHAPTER VII

TRIANGULATION OF EVIDENCE ON THE CLINICAL ROLE OF THE HOSPITAL PHARMACIST IN THE UNITED KINGDOM NATIONAL HEALTH SERVICE

7.1. Introduction.

The results of the research have been reported in the last three chapters. They were from two questionnaire surveys that quantified the extent of clinical pharmacy service provision in the UK NHS, a literature review that assessed the evidence whether these services could be expected to improve the effectiveness and cost-effectiveness of care, and a series of interviews seeking health professionals' views on the clinical role of the hospital pharmacist. In this chapter, the results from the three studies will be triangulated. The triangulation will present the evidence for various roles, the services that they include and the strength of the evidence in favour of them being undertaken. Based on this information, the clinical roles that hospital pharmacy should adopt will be proposed. The chapter will conclude with a description of the limitations of triangulation, the discrepancies in the evidence supporting the triangulation and an exploration of the remaining research questions.

7.2. Triangulation of Evidence.

7.2.1. Medicine Supply.

Medicine supply was not explored in detail in the questionnaire surveys and some aspects of supply, such as the purchase and dispensing of medicines, were not examined. Questionnaire II did, nonetheless, provide some information on service organisation and provision that can be linked to the supply function. It found that all pharmacies were open for an average of 8.5 hours on weekdays and many provided out-of-hours services using a pharmacist on-call from home (88.1%) or a resident pharmacist (9.5%). It can be assumed that medicine supply was available at all times, although less so when the out-of-hours service was provided by a pharmacist on-call from home. Many pharmacies dispensed trial drugs (98.1% for drug company-sponsored trials), provided cytotoxic reconstitution (54.4%), intravenous additive (IVA) (36.5%) and total parenteral nutrition (TPN) (67.6%) services.

The literature review largely ignored supply issues since its remit was to examine clinically-orientated services. In addition, medicines are still supplied to NHS hospitals by their pharmacy departments and no evaluations of competing supply services were found. The literature on IVA (including cytotoxic therapy and TPN), clinical trials support and residency services were, however, examined. The review found limited evidence suggesting that the provision of IVAs by pharmacy led to improved care and reduced drug expenditure. No evaluations of out-of-hours or clinical trials services were found.

There was, however, general support from all interviewees for the pharmacists' role in drug supply. Roles that were strongly supported were pharmacists' involvement in drug purchase, storage, supply to patients (dispensing), and in the provision of trial drugs and IVAs. Some nurses were in favour of pharmacists helping control drugs on the wards. Many non-pharmacists, and some pharmacists, felt that pharmacies should provide out-of-hours supply services.

The supply role mainly encompasses non-clinical functions. Standard medicines were supplied by all pharmacies and specialist products, such as IVAs, by many pharmacies during, and outside, normal working hours. The literature on the supply role, where it was examined, was sparse. This role, however, was perceived to be a key one for pharmacy by all interviewees.

7.2.2. Provision of Drug Information in Hospitals.

The questionnaire survey found that drug information was provided by almost all hospital pharmacies. Most (59.6%) had a drug information centre (DIC). Irrespective of whether or not a DIC was present, 78.6% of pharmacies provided clinical information on drug use. Residency services, which would have provided a ready source of out-of-hours drug information, were available in only 9.5% of hospitals but the provision of information services outside normal working hours was not examined in detail.

The few evaluative studies on information services in the literature showed positive effects of information provision on the process of care. These were incomplete evaluations.

The interviews revealed widespread support for the pharmacist's role in the provision of drug information in hospitals. Pharmacists, other professionals and managers were in favour of the availability of DICs and the provision of information routinely by all pharmacies. The quality of out-of-hours information services was criticised, mainly by non-pharmacists.

Pharmacies were commonly providing drug information. Their role in its provision was supported by evidence from the interview survey but literature in the area was scant.

7.2.3. Educational Services for Hospital Health Professionals.

The questionnaire survey revealed that most hospital pharmacies provided education for pharmacy staff (68%) (mainly pharmacists) and nurses (64.2%) but few provided it for

doctors (6.5%) or other health workers in secondary care (15.4%).

The literature review found some studies that supported the pharmacist's role in the provision of education for pharmacists. These studies were limited in scope but suggested that competence improved following education. There were no sound evaluations of educational services provided for other health professionals.

Pharmacists strongly supported a role for themselves in the education of other pharmacists and nurses but were less enthusiastic about such a role with doctors and other health workers. Nurses encouraged such an involvement. In contrast to the reservations expressed by pharmacists, however, doctors indicated that they would welcome pharmacist involvement in their education, both formally and informally.

7.2.4. Research.

The questionnaire survey indicated that many hospital pharmacies were performing practice research (41.3%) and were involved in the design (34%) or in some aspect of the implementation of clinical trials, such as compliance monitoring (73.3%).

No studies were found that evaluated the role of hospital pharmacists in research or clinical trials.

Most interviewees perceived a role for hospital pharmacists in clinical trials and research. Many pharmacists, and some doctors and nurses, wanted research activities increased.

Some pharmacies were performing practice research and many were providing support for clinical trials. The interview survey supported these roles but there was no evidence for their effectiveness in the literature.

7.2.5. Therapeutic Advisor.

7.2.5.1.   Advisor on drug policy.

The questionnaire survey found that pharmacies were providing many advisory services on drug policy. Pharmacies were involved routinely in policy creation through Drug & Therapeutics Committee (DTC) activities (96.5%). Most hospitals had a formulary (82.4%)

and pharmacies usually provided information for use in new product evaluations (59.7%), formulary decisions (72.5%) and the creation of prescribing policy (74.6%). Where there were clinical directorates, many pharmacies (64.9%) advised them on drug policy. Most pharmacies supporting medical audit provided information for use in policy creation (71.3%). Pharmacies often were involved in implementing the formulary system (88.6%) but less often in the implementation of infection control policy (6.1%). Pharmacies helped assess drug policy by providing information on adherence to it in medical audits (61.8%).

The literature revealed a body of descriptive evidence that strongly suggested a role for pharmacists as advisors on hospital drug use policy. The evidence from evaluations was limited since these studies were incomplete evaluations and may have been subject to problem such as bias. Nevertheless, the literature suggested a role for pharmacy in the area of drug policy creation and implementation and, to a lesser extent, in policy evaluation.

In the interview survey, there was general support from pharmacists and others for a pharmacy role in policy creation and implementation. There was some confusion about, and less support for, a role in policy assessment; pharmacists favoured involvement in drug utilisation review (DUR) and were less positive about audit whereas others favoured audit as the means of assessing policy and did not mention DUR.

Most pharmacies were involved in drug policy creation, implementation and evaluation. The literature supported this role although the quality of the evidence was mediocre. In contrast, the interview evidence strongly favoured this role.

7.2.5.2.   Advisors on individual patient issues.

Most pharmacies advised on prescribing for individual patients. The questionnaire revealed that most pharmacies provided ward pharmacy services (93.4%) and pharmacists on ward rounds (77.6%). Advice on patient-specific drug issues would have been provided in these settings. In many hospitals, pharmacists advised as part of multidisciplinary teams providing services such as TPN (36.6%), patient controlled analgesia (PCA) (15.5%) and cytotoxic therapy (23.1%) services. Few pharmacies provided advice outside normal working hours via the residency services (9.5%). Although some advice may have been provided out-of-hours by pharmacists on-call from home (88.1%), residency was considered to be a more advice-orientated service. Advice was also provided on pain control (8.3%) and wound care (16.3%).

The literature survey showed that prescription-monitoring services often resulted in a prescription change. A few studies, which assessed doctors' or pharmacists' perceptions of the contribution that the service made to patient care, were positive although their methods are subject to criticism. No full evaluations of this service had been performed but the mass of evidence suggests a role for pharmacists in advising on individual patients' drug therapy. Several studies suggested that pharmacists contributed to patient care by providing advice on ward rounds. Although many of these studies were subject to criticisms regarding their methods, some produced plausible evidence of the effectiveness of the service in psychiatry. No evaluations were found of out-of-hours services. Studies on team services were weak but they suggested a role for pharmacists in psychiatric therapy, cancer care and parenteral nutrition teams.

Interviewees strongly supported the pharmacist's role in advising on individual patients' therapy via the ward pharmacy service, attendance on ward rounds and team services. In contrast to pharmacists, who disagreed about the effectiveness of their attendance on ward rounds, non-pharmacists felt that those who were active on rounds made valuable contributions. There was less support amongst all interviewees for the out-of-hours advisory service. It was considered to be inadequate by some non-pharmacists mainly because of the relative lack of knowledge and experience of the pharmacists involved.

Advice on individual patients' therapy was provided often during normal working hours by pharmacists alone (ward pharmacy) or acting as members of teams (TPN, cytotoxics, ward rounds). This role was supported by a limited amount of literature evidence and strongly supported by interview data. In contrast, the provision of advice outside normal working hours was limited, un-evaluated in the literature and not well-supported by interview data.

7.2.6. Optimisation of the Use of Medicines.

The optimisation of the use of medicines included several services. Pharmacies participated frequently in ward rounds and often provided ward pharmacy. The questionnaire survey found that therapeutic drug monitoring (TDM) was provided by 21.1% of pharmacies, that many helped administer the Committee of Safety of Medicines (CSM) adverse drug reaction (ADR) scheme (45.9%) or another ADR scheme (12.5%), and that few participated in clinical audit (7.2%) or took medication histories (16.4%).

As already mentioned, the literature suggested a role for pharmacies in prescription monitoring and in ward rounds. For TDM, the literature evidence was incomplete. Some studies suggested that it improved the process of care and one study suggested that outcomes improved as a result. The studies on medication history-taking suggested that this service can improve the process of care. No evaluations were found of ADR monitoring or audit.

As already stated, there was widespread support for ward pharmacy. Pharmacists favoured participation in ward rounds less than non-pharmacists. In contrast, pharmacists supported the provision of TDM whereas non-pharmacists were less positive about this. Some interviewees, mainly doctors and pharmacists, mentioned ADR monitoring and medication history taking as roles for the pharmacist.

Pharmacies were involved in the optimisation of the use of medicine mainly via ward pharmacy and through participation in ward rounds and in the CSM ADR monitoring scheme. Fewer provided TDM or medication history-taking services. The literature provided some support for the role, particularly for services such as ward pharmacy, participation in ward rounds and TDM. The interview survey, however, found little support for services other than ward pharmacy and participation in ward rounds for the optimisation of medicine use.

7.2.7. Cost Control.

Most pharmacies provided services that helped control drug expenditure. The extensive involvement in DTCs and formulary systems have been mentioned. Many pharmacies provided general financial information on drug use (90.7%) and information on financial aspects of drug use for medical audit (85.8%). Those that provided advice to clinical directorates (64.9%) probably provided some that helped control costs. Widely available services such as ward pharmacy, and the provision of advice on ward rounds and in the creation of drug policy, also contributed to cost control. Involvement in profit generation schemes and in informing contracts were not inquired about in the questionnaire survey.

The literature on pharmacy services often concentrated on the savings that could be made as a result of services such as formulary management. There was some evidence that the implementation of formularies and drug policies, the provision of advice to multidisciplinary teams, and the provision of IVAs reduced drug expenditure but no full economic evaluation were found. There were also no economic studies on prescription monitoring services. The

literature, therefore, suggested that some pharmacy services may contribute to cost control.

Evidence from the interview survey strongly supported a pharmacy role in cost control via formularies and policies, and the provision of therapeutic advice and financial information. All interviewees supported these services but non-pharmacists adopted an economic perspective on cost control. They emphasised the total savings, including drug and non-drug savings, that could be made through the use of sensible drug policies. Pharmacists focused, instead, on savings made only on drugs. Less strongly supported as contributors to cost control were the provision of IVAs, participation in profit generation schemes, and the provision of data to inform contracting. Only some pharmacists and non-pharmacists suggested that cost control was enhanced by IVAs or the provision of information for contracting. Participation in profit generation schemes was mentioned by a few pharmacists and by several managers.

Most pharmacies were assisting with cost control, mainly by providing advice on drug policy and drug therapy for individual patients, and by providing financial information on drug expenditure and use. The literature suggested that some of these services could help control costs. The interview survey, however, revealed widespread support for a role in cost control.

7.2.8. Patient Education and Empowerment.

These roles had been adopted to a certain extent. The questionnaire showed that many pharmacies counselled patients (60.3%) or were involved in self-medication (self-administration) schemes (50.1%). Fewer were providing other educational services (25.4%).

Many studies showed that education, via counselling or written information, improved patients' knowledge. Few studies went on to assess either behavioral change or improvement in outcomes. The minority of studies that did, showed improved compliance following education. These did not measure outcomes but suggested a positive effect of education on patient care through improved compliance. Like the literature on patient education, that on self-medication failed to measure behavioral changes or improved outcomes. None of the studies considered economic factors.

The interview data strongly supported a role for pharmacists in educating and empowering patients by providing patient counselling and contributing to self-medication schemes. Pharmacists and non-pharmacists supported these roles in general although there was debate

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amongst nurses and pharmacists regarding their respective roles. Some pharmacists and nurses felt that the role was solely theirs whereas others felt that there was a place for both groups in ensuring the comprehensive provision of services to all patients.

Many pharmacies were involved in educating and empowering patients to take medicines correctly and the interview survey strongly supported such roles. In contrast, the literature evidence for the effectiveness of these services was incomplete but did support these roles.

7.2.9. Roles at the Interface and in Primary Care.

Pharmacy's clinical roles at the interface and in primary care were examined in Questionnaire I. This questionnaire did not, however, examine medicine supply to primary care or the inspection of primary care institutions. Drug information was provided often by DICs to nurses (49.7%), general practitioners (GPs) (51.6%), community pharmacists (41.5%), and other health workers (33.3%) and institutions in primary care (26.9%). Advice on drug policy was provided to GPs (35.9%) as was information on general drug-related issues (40.6%). Education was provided rarely for primary care workers other than nurses (52.8%) and workers in primary care institutions (31.6%). Nurses often received advisory services on topics such as wound care (52.8%) but advisory services were provided less frequently to other primary care workers. There was limited contact with community pharmacists. About 25% of respondents counselled patients in primary care but other education was provided infrequently.

The literature revealed one study, which was a partial evaluation, that showed savings due to hospital pharmacy involvement in the provision of specialised medicines to primary care. Studies on patient counselling and education were limited in scope and methods. None considered economic factors and most followed patients for a limited period after discharge. No evaluations were found of the provision of drug information, therapeutic advice, education for health workers and advice on drug policy, the inspection of residential or nursing homes, the optimisation of therapy, team care and assistance with community pharmacists' development. In summary, the literature on roles at the interface and in primary care was sparse but suggested roles in cost control and in patient education.

Most roles at the interface were mentioned only by pharmacists in the interview survey and most frequently by senior pharmacy managers and Community Services Pharmacists (CSPs)

within whose area they fall. The exceptions were the provision of drug information (also proposed by doctors), participation in multidisciplinary teams (proposed by doctors and nurses) and advice on drug policy (proposed by doctors and managers).

Many pharmacies were providing services to primary care and fewer were providing services at the interface. The evidence for their provision was meagre and the support for such roles was moderate and usually one-sided (pharmacy only).

7.2.10.   A Role in Prescribing.

Except for anticoagulation control, in which 4.8% of hospital pharmacies participated, the pharmacists' role in prescribing was not examined by the questionnaire survey. The anticoagulation control service would have included a prescribing role.

The literature assessment found that anticoagulation services have been evaluated to a limited extent; pharmacists performed at least as well as doctors in terms of service process, output and outcome, but the results are not generalisable and no economic evaluations had been performed. No other studies were found on the pharmacists' prescribing role.

Pharmacists and doctors spoke of a potential, but limited, role for pharmacists in prescribing in the interview survey. Both groups refrained from promoting a general prescribing role but felt that pharmacists could competently prescribe medications, such as TPN, within protocols.

7.2.11.   Record-keeping.

This role was not examined in the questionnaire survey. Pharmacists' potential contribution to care by writing in medical records has been proposed in the literature but the role has not been evaluated. There was moderate support for this role in the interview survey from some interviewees in all groups.

7.2.12.   Role in Management.

Some (26.7%) pharmacies performed pharmacy audit. This was often an audit of clinical or non-clinical pharmacy services and hence a quality management activity. The questionnaire survey showed that the chief pharmacist normally (60%) managed the hospital drug budget. They also managed the pharmacy service and were accountable to a hospital manager (48.5%).

The only aspect of the management role that was examined in the literature assessment was the performance of pharmacy audit as a quality improvement activity. There was some evidence that audit may improve service performance but the studies were limited and audit may be difficult to evaluate.

Most interviewees assumed that the pharmacy department should be managed by the chief pharmacist. Management of the quality of pharmacy services was raised with regard to specific services, such as the out-of-hours and medicine supply services, when these were perceived to be poor quality. There was an expectation that pharmacy managers should be responsible for ensuring the quality of their service.

Pharmacies were usually managed by pharmacists. In addition, pharmacists were involved frequently in the management of drug budgets and were involved sometimes in the management of service quality. The literature suggested that quality management may be useful. There was strong support from the interview data for pharmacy roles in the management of their services and of the pharmacy department.

7.3. Summary - The Evidence for Clinical Roles for the Hospital Pharmacist.

This section summarises the evidence for clinical pharmacy roles, identifies discrepancies between the reality of service provision, the evidence supporting it and health workers' opinions on the pharmacists' clinical role. Table 7.1. depicts the evidence. There are obvious gaps in this evidence. Some are due to the scope of the research, which concentrated on clinical pharmacy services but, throughout, there are major gaps in the literature evidence. From this evidence, the elements of the clinical role of the hospital pharmacist can be proposed. Tentative suggestions will be made here but these will be refined in light of the evidence that will be presented in the next two chapters on barriers to, and opportunities for, role development in hospital pharmacy. A final proposition on the clinical role of the hospital pharmacist will be made in Chapter X.

7.3.1. Summary of Evidence.

There were similar levels of evidence in all three studies for roles that helped optimise the use of medicines and some that helped control costs. Where evidence was lacking, the absent factor was evaluative evidence from the literature. The evidence from the questionnaires

matched that from the interviews for several roles in that services were provided and seen to be important. These included supply, drug information, therapeutic advice, education for nurses and pharmacy staff, and some services in the areas of the optimisation of the use of medicines and cost control. There were some discrepancies. For example, there was less pharmacy involvement than interviewees' thought desirable in the education of doctors and patients, the quality assurance of pharmacy services, prescribing, self-medication schemes, research and the provision of IVAs. The reverse was true for many roles in primary care and for TDM.

7.3.2. Potential Clinical Roles for Hospital Pharmacists.

Hospital pharmacists should be sources of advice on the optimal use of medicines. This would involve the provision of advice at a policy making level and at the individual patient level. In addition, advisory services might best be provided within the context of a multidisciplinary team. The advisory role would include both a clinical and a financial part and pharmacists are likely also to have important roles in containing costs and in reducing the risks associated with the use of medicines. Pharmacists will have major roles in the provision of drug information to health care staff in primary and secondary care. They are likely to be involved in the provision of education for pharmacy staff and for other groups in the hospital and, perhaps, in primary care. Pharmacists will have key roles in improving patients' abilities to use their medicines properly but some of these roles may be performed within the multidisciplinary team framework. Pharmacy's traditional research role in clinical trials may be expanded to include practice research and multidisciplinary research. Stronger arguments may be put forward for a role in uni- and multi-disciplinary audit and in the assurance of the quality of pharmacy services.

This proposal on role is preliminary. Firmer proposals will be presented following consideration of the evidence that will be presented in Chapters VIII and IX. These chapters will contain information on hospital pharmacy's strengths and weaknesses and on the opportunities and threats that exist in the environment to role development.

7.4. Limitations of the Triangulation.

The limitations of the questionnaire, literature and interview studies have been addressed in Chapters IV, V and VI respectively. Here, the limitations of the triangulation method will be

Table 7.1. The strength of the evidence on clinical roles for UK NHS hospital pharmacists.

Role	Service	Strength of Evidence[1]		
		Questionnaires	Literature	Interviews
Supply of medicines	Purchase and distribution	NE	NE	+ + +
	Control on the wards	NE	NE	+ +
	Supply - In-patients	+ + +	NE	+ + +
	Supply - Out-patients	+ + +	NE	+ + +
	IVAs[2]	+ +	+	+ + +
	Trial medication	+ + +	O	+ + +
	Out-of-hours supply	+ + +	O	+ +
Drug information	Within hospital	+ + +	+	+ + +
	Out-of-hours	+	O	+
Education of hospital staff	Pharmacy staff[3]	+ + +	+	+ + +
	Doctors	+	O	+ + +
	Nurses	+ + +	O	+ + +
	Other health workers	+	O	+
Research	Practice research	+ +	O	+ + +
	Clinical trials	+ + +	O	+ + +
	Multidisciplinary research	NE	O	+ +
Therapeutic advisor	Drug policy			
	Creation	+ + +	+ +	+ + +
	Implementation	+ + +	+ +	+ + +
	Assessment	+ +	+	+ +
	Individual patients			
	Ward rounds	+ + +	+ +	+ + +
	Ward pharmacy	+ + +	+	+ + +
	Out-of-hours	+	O	+
	Team services	+ +	+	+ + +
Optimise medicine use	Ward pharmacy	+ + +	+ +	+ + +
	Ward rounds	+ + +	+	+ + +
	TDM[4]	+ +	+	+
	ADR monitoring	+ +	+	+
	Clinical audit	+	+	+
	Medication history taking	+	+	+
Cost control	Stock procurement and control	NE	NE	+ + +
	Provision of financial information	+ + +	NE	+ + +
	Ensuring effective & economic drug use[5]	+ + +	+ +	+ + +

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Table 7.1. continued.

Role	Service	Strength of Evidence[1]		
		Questionnaires	Literature	Interviews
Cost control	Formularies	+ + +	+ +	+ + +
	IVAs[2]	+ +	+	+ +
	Profit generation	NE	NE	+
	Directorate work	+ + +	O	+ + +
	Informing contracts	NE	NE	+
Patient education and empowerment	Patient counselling	+ + +	+	+ + +
	Self-medication schemes[6]	+ +	+	+ + +
	Patient education	+ +	+	+ + +
Primary care	Supply	NE	+	+
	Drug information	+ +	O	+ +
	Therapeutic advisor	+ +	O	+
	Inspection	NE	NE	+
	Optimise therapy	NE	O	+
	Patient education	+ +	+	+
	Education of health workers	+ +	O	+
	Advisor on drug policy	+ +	O	+ +
	Team care	+	O	+ +
	Community pharmacy development	+	O	+
Prescribing	General	NE	O	O
	Limited[7]	+	+ +	+ +
Records	Medical notes	NE	O	+
Management	Staff and services	+ + +	NE	+ + +
	Quality	+ +	+ +	+ + +

Notes to table 7.1;

1. The strength of evidence was coded as follows;

+ + +   Supportive.   60% or more of pharmacies were providing the service.
The literature contained some sound studies.
Agreement existed amongst interviewees on this role.

+ +   Suggestive   20% or more of pharmacies were providing the service.
The literature contained many studies but few evaluations.
Some agreement existed amongst interviewees on this role.

+   Slight.   Less than 20% of pharmacies were providing the service.
The literature contained few studies and no evaluations.
Some support or disagreement at interviews on this role.

O   No evidence.
NE   Not examined.

2. Intravenous additives including cytotoxic chemotherapy and parenteral nutrition;
3. Mainly related to education of pharmacists (rather than technicians or assistants);
4. Therapeutic Drug Monitoring;
5. Using the advisory service on ward rounds and ward pharmacy and by implementing drug policy;
6. Also known as self administration schemes;
7. Limited to prescribing of some items within protocols.

addressed.

Triangulation amalgamated results from three studies; questionnaires that quantified clinical pharmacy service provision in mid-1992, a literature evaluation of clinical pharmacy services over the past 27 years and interviews that took place in the latter six months of 1993 in eight

hospitals. The studies examined distinct aspects of clinical pharmacy in different ways. Although the first study informed the two subsequent studies, and these two studies informed each other, the results of each study were afforded equal weight in the triangulation process. Triangulation involves subjective judgements and there is debate on triangulation methods (see Chapter III). Some advocate sub-studies should inform a main study and their results should be subservient to the main study. Here, it was thought that the best approach was to treat results equally. This permitted a balanced amalgamation of results describing the actuality of service provision (questionnaires), the evidence of effectiveness (literature) and opinion on service value (interviews). Subjective judgements were unavoidable. The were made on the basis of evidence from the studies rather than on personal views.

7.5. Remaining Research Questions.

The questionnaire survey examined several roles and services but only a few, such as clinical trials, medical audit, education and drug information, were quantified in any in detail. None were thoroughly scrutinised. Although formularies[158] and DTC[157] activities have been researched more extensively in the recent past, detailed studies on other aspects of the clinical role might be the subject of further work. In addition, in light of the results of the interview survey, the questionnaire survey of services provided to primary care and at the interface falls short of a comprehensive quantification of these services.

The research on service evaluation outlined in Chapter V could provide the basis for a national research strategy in clinical pharmacy. For many services, there are insufficient data on need and service requirements. In almost all cases the evaluative data are limited, particularly the economic data. The lack of evidence is summarised in Table 7.1. The following questions need answers. What services are required? Who needs them? Is there evidence that these services are effective in improving patient outcome? Who is the most appropriate provider of the service? What is the most efficient way in which these services

may be provided? Clearly, these questions will require research by multidisciplinary teams. The dominant uni-disciplinary ethos of pharmacy practice research at present stimulates the question "How may this multidisciplinary research approach be achieved in pharmacy?" Closer co-operation with health services research units is one solution.

The interview survey provided opinions on the services considered to be part of the clinical role of the hospital pharmacist. Differences existed between different groups, and within pharmacy, on aspects of this role. Although the next chapter will help explain why this was so, there is a need for research to examine services over which there was substantial disagreement, such as patient counselling and empowerment, out-of-hours services and drug control on the wards.

Some policy questions remain unanswered. Certain roles, such as the provision of education for patients and the extension of activities at the interface, have been recommended in documents produced by the Department of Health[2-4] and various professional[6,7] and other[5] organisations. Changes in the NHS[16,17] are also having an effect on service requirements. Although the remainder of the thesis will consider organisational issues in hospital pharmacy and the environment in which hospital pharmacists work, it is likely that more detailed work will be required to determine how government and the pharmacy profession's initiatives affect service provision and roles.

CHAPTER VIII

STRENGTHS AND WEAKNESS OF HOSPITAL PHARMACY IN THE UNITED KINGDOM NATIONAL HEALTH SERVICE

8.1. Introduction.

This chapter and the subsequent one consider the pharmacy department as an organisational unit of the hospital. They examine issues within pharmacy, such as managerial and pharmacist-related factors, professional relationships with others in the hospital, and environmental factors that may affect pharmacy, such as the NHS changes. Both chapters are based on the research data but relevant literature in the areas of management, pharmacy and professional development has also been used.

Chapters VIII and IX constitute a SWOT (strengths, weaknesses, opportunities and threats) analysis of hospital pharmacy. This chapter will describe the constituents of a SWOT analysis and will concentrate on strengths and weaknesses. Chapter IX will continue by focusing on opportunities and threats. These two chapters will make comparisons, where pertinent, with some results from recent key studies on pharmacy skill mix[446] and organisational management[18] in the UK NHS. Finally, in Chapter X, the evidence presented in Chapters VIII and IX will be used to refine the tentative proposal on the future clinical role of the hospital pharmacist in the UK NHS that has been suggested in Chapter VII.

8.2. SWOT Analysis of Hospital Pharmacy.

SWOT analyses are often used to formulate strategy. Here it facilitated the presentation of the interview data, allowed examination of hospital pharmacy as an organisation within the hospital and the NHS, and aided the exploration of pharmacy's relationships with other organisational groups, such as medicine, nursing and management. The analysis is based on interview survey data, which included the views of all grades of pharmacy staff, doctors, nurses and managers on the value of currently-provided pharmacy services and on barriers to, and opportunities for, further service developments. Since these data were provided by eight sites there are some difficulties in carrying out a SWOT analysis; a strength at one site might be a weakness at another. To surmount this problem, the majority view is presented. To retain the depth of data, however, the variation in views on such issues is discussed. Generally speaking, strengths and weaknesses are internal to pharmacy whereas opportunities and threats largely arise from the external environment although the two sets are closely interrelated[447].

8.2.1. Pharmacy's Strengths.

Pharmacy's strength lies in its functions, its skills and its access to information. Some of these

can be viewed as factors that provide pharmacy with a power base. This power may derive from several source, including pharmacy's knowledge base, its ability to reduce uncertainty in the organisation (by reducing therapeutic and monetary risks), its authority to provide services and the characteristics of individual members of its staff. Much has been written about power, especially about the power that individuals have in organisations. A brief discussion of the means whereby organisational units acquire and maintain power is provided as a background to the discussion on pharmacy's power base. This is followed by an exploration of the nature of pharmacy's power base and other factors that are considered to be strengths.

8.2.1.1. Power.

The power possessed by units within organisations is based on the perceived importance of the functions that they perform. In the extreme, the organisation may become dependent on units that perform tasks that are of central importance to its success. This dependence only confers power, however, if the functions cannot be performed by others. Functions also confer power if they reduce uncertainty in the organisation and specifically if uncertainty has a large influence on the work of the organisation. Individuals may have power also due to their authority, expertise, performance, personal characteristics, access to powerful people in the organisation and performance, the power of the functions that they perform and their political skills[446]. All of these factors are important in pharmacy.

Pharmacy appeared to have some power in all the organisations visited. The sources of power were pharmacy's authority to provide services, the knowledge base that it possessed, the ability to reduce uncertainty in the hospital and the characteristics of individual pharmacists. The amount of power possessed by pharmacies varied according to its source and the extent to which the organisation acknowledged that power. Where pharmacy had little power in the organisation, its authority to provide services was one of the main sources of power. Pharmacies with greater organisational power had used their ability to reduce uncertainty and the characteristics of individual pharmacists to acquire this power. Pharmacy's knowledge base was an important factor at all sites. These factors will now be explored.

8.2.1.1.1. The authority to provide services.

The authority to provide pharmacy services was due to the monopoly that pharmacy had on service provision, legislation that supported good practice in areas such as manufacturing, and tradition.

Pharmacy still holds monopoly powers on pharmacy services although this may soon change. Managers commented on this and some were unhappy about the situation.

"One of the problems is that in the hospital system we've got a monopoly service. What option do I have? Who am I to ask? " (Clinical Director)

Most pharmacists, and a few non-pharmacists, recognised that this monopoly was not a stable source of power since companies, such as Boots, were entering the market for hospital pharmacy services.

"The contract with the pharmacy may be put to tender in the future. I see that as an option. " (Clinical Director)

Pharmacy's authority to provide some services depended partly on their traditional provision of drugs and services that dealt with drug distribution and control. These included the purchasing, storage and distribution of drugs, and formulary, drug information and ward pharmacy services. In the main, there was little debate about pharmacy's right to provide these services in the interview survey.

Legislation did not appear to have been used often as a source of power possibly because of the lack of legislation that gives pharmacy the right to provide services. Nevertheless, some pharmacies had used publications, such as those pertaining to good manufacturing practice[449-453] and the COSHH (Control of Substances Hazardous to Health)[454] regulations, to support the provision of services, such as intravenous additive (IVA) services.

"The junior doctors were doing the cytos (cytotoxics). *They were the least experienced ones and the ones who were going to be able to make the greatest hash of things. To be honest even a simple mistake could lead to greater consequences with cytos than with other IVs* (intravenous products). *We said we were going to have to look at this. The trend, if we centralised cytos, the strong trend was to do it in pharmacy. The HSC* (Health and Safety Committee) *were going to ask pharmacy to do it".* (Specialist Pharmacist)

"With the CIVA (central intravenous additive) *service it was timing. You have to be opportunistic and choose the right moment. We picked a time when health and safety was an issue, COSHH".* (Chief Pharmacist)

Much of pharmacy's power did not, therefore, derive from legislation, tradition or monopoly of service. Their knowledge base and other factors were far more important.

8.2.1.1.2. Pharmacy's knowledge base.

Pharmacy's knowledge base gave them expert power. Pharmacists were considered to be drug experts by all interviewees because of their specialist knowledge of drugs and drug use and their ability to maintain this knowledge base given the rapidity of therapeutic advance.

Pharmacists thought that they possessed a wide range of knowledge on drug therapy, including knowledge about patients and their problems and information on drugs and dosage aids. Pharmacists felt that they should be involved in all areas where drugs are used. Non-pharmacists felt that pharmacists had a sound knowledge of drug legislation, action, formulation, cost, use, new medications, side effects and availability. Some thought that pharmacists could more easily spot side effects, advise on safe, easy and reliable drug administration, and provide uncomplicated and relevant drug information to patients. Pharmacists were expected to advise on variety of topics.

"There's so much legislation with medicines, so many preparations that it's really impossible for all grades of staff to familiarise themselves with and to keep themselves updated". (Nurse Manager)

"I think I rang for DI (drug information) *once for a pregnant lady allergic to penicillin in the middle of the night."* (House Officer)

"With TPN (total parenteral nutrition) *we just give them* (pharmacist) *the IV results and they do it. It's very useful they tell you what to prescribe."* (House Officer)

"I can turn and ask an opinion of them on drug therapy" (Clinical Pharmacologist).

"Having her (specialist pharmacist) *expert advice is good since we can't be informed about drug costs and policy all the time"* (Consultant)

"I'd like them on the ward round since they were a great source of advice". (Consultant)

"Pharmacists are quite highly qualified. We don't have clinical pharmacologists any more so pharmacists should be acting in their place". (Consultant)

Non-pharmacists believed that pharmacists have specialist knowledge in areas such as pharmaceutics, pharmacokinetics and pharmacology that exceeded doctors' knowledge.

"The pharmacist can advise on the best formulations, the dose perhaps and as regards interactions and side effects. Pharmacists are likely to be more knowledgeable than doctors in that respect". (Consultant)

Several non-pharmacists felt, however, that pharmacists' knowledge of patients' needs was incomplete and that they had difficulty in applying their knowledge in practical situations.

".. pharmacists are very well trained and know what they're talking about with respect to pharmacy. They're not always on the ball when applying it to the patient situation. They used to, at least until they got a bit of sense, ring me up about doses outside the BNF (British National Formulary) *dose. There is a dichotomy between the theory in the books and the position on the ward. ..."* (Consultant)

"She (pharmacist) *knows about the product, its cost and has done the research on the products efficacy. They* (pharmacists) *should have as much knowledge as the clinician. Their views are likely to be more objective and they can tell about the comparative effectiveness of products".* (General Manager)

Some pharmacists recognised that there were limitations to their knowledge and that they provided care within a multidisciplinary team framework.

"I'm a pharmacist and I know the drugs. They're nurses and they know the patients." (Specialist Pharmacist)

The results of Khanderia's[455] 1993 study of clinical directors' and pharmacists' opinions of pharmacy services to directorates are in agrement with the results presented here. Khanderia found that most clinical directors thought that pharmacists had a br ad-based knowledge of drugs and drug issues. Some thought also that pharmacists' professional training was a strength.

Pharmacists were beginning to specialise at some of the eight sites studied in this project. Specialisation was viewed as a source of power by some pharmacists since it would help them attain expertise, provide better patient care and gain acceptance as experts in the multidisciplinary team.

"The clinical service is good because the pharmacists have specialised. ..a number of years ago I thought you can't be an expert if you rotate. I always believed that we should follow the medical model. Like all experts, they specialised. " (District Pharmaceutical Officer)

"My ideal job would be to be a specialist, rather like SHOs (Senior House Officers, a more junior training grade doctor) *specialise. If we were, we'd be able to give ideal patient care. "* (Specialist Pharmacist)

Some departments had reduced the number of rotational posts to facilitate specialisation. It was thought that the consequent increase in pharmacists' expertise would increase their status amongst other professions since specialisation was thought to have increased the power of the medical profession.

"We need to be broad but we need to specialise. We've got a broad background but you can't be a jack of all trades. It's like the doctors specialise; we need to do the same. It's no use having a novice on the directorate. " (Chief Pharmacist)

Pharmacists knowledge of drugs gave them the expert power to develop services that were consistent with this knowledge base. The knowledge base also included non-therapeutic knowledge, such as budgetary and service management skills. Pharmacy managers at several sites believed that their staff should integrate non-clinical and clinical roles to maintain their power base.

"I believe it's a major mistake to split supply and clinical. The two should be as closely intertwined as possible. It's our power base. It's very difficult to have a handle on a service when it's split. " (Chief Pharmacist)

This interpretation of services had happened to a limited extent in sites with directorates. At these sites, pharmacists managed all services to a directorate and provided drug budget management expertise in addition to clinical services. This integrati n of services had helped pharmacy to access and use information that reduced organisational uncertainty and hence had given pharmacy power.

8.2.1.1.3.   Pharmacy's ability to reduce uncertainty.

In health care uncertainty may be caused by many factors. The main risks associated with drugs are budgetary and iatrogenic. From the organisation's perspective, the drug budget may get out of control or therapeutic mishaps may result in litigation and a fall in the quality of services. Pharmacy can help reduce uncertainty by helping control drug budgets and by reducing the risk of drug errors.

Drugs are expensive and control of the drug budget often poses uncertainty.

"We'd identified the difficult parts of the budget to control. Drugs were up at the top after we'd sorted out the staff. One of the ways it became apparent we could do something about it was with a pharmacist on the ward. It was seen as a priority. The other things we could control here more cheaply. Drugs, no. The doctors also wanted it. They thought it was good. There was also the expectation from senior management that the CSM (Clinical Services Manager) *should put in place a control mechanism for difficult areas of management. We got brownie points for the clinical pharmacy service."* (Clinical Services Manager)

Pharmacy was thought to be able to reduce uncertainty by providing information on drug expenditure.

Traditionally, pharmacy has managed the drug budget satisfactorily. In addition, it has extensive information on drug use from computerised drug issue systems. These provide information on how much of any drug is being used and by whom. In addition, the ward pharmacy service provides information on the appropriateness of drug use.

"Our strength is we dispense drugs and it all goes through a computer system and we have the information. So outsiders aren't so much of a threat. With the JAC (computer system), *information is produced in any way you want it. We've got people on the wards and they know what's happening."* (Chief Pharmacist)

This integrated power base was considered to be important for the survival of pharmacy.

"By definition Boots don't do clinical pharmacy. So if clinical directors employed them they'd lose all the clinical support which the sisters, the nurses and the junior doctors get from the clinical pharmacy service, and the longer term strategy planning for the clinical directors to use with the purchasers. The concept was simple, the integrated service." (Chief Pharmacist)
"We are much better managers than other departments. Our strength is our influence on drug spending. Devolved budgets have strengthened our position. Clinical directors are now in control. They look to pharmacists to advise them on ways of controlling their budget. We have the information relating to it. I send the clinical directors statements each month. It's more than they can get from Finance. And also it's got the clinical information from individual directorate pharmacists." (District Pharmaceutical Officer)
"It's survival is assured. If it can prove its financial worth then it's ok." (Clinical Pharmacologist)

A Clinical Services Manager commented that pharmacy

"is the biggest chunk of support services and has the best power base with respect to its

interaction with doctors and its knowledge of what's going on".

Pharmacists were considered also to contribute to the reduction of therapeutic risk and, thereby, to the reduction of uncertainty regarding litigation. This is more important now since NHS trusts have become directly responsible for financing litigation costs.

"They contribute to safety massively in the organisation. " (Nurse Manager)
"She (pharmacist) *acts to improve education and communication with junior doctors so that standards are retained even though the doctors change every 6 months. "* (Clinical Services Manager)
"In terms of the QA (quality assurance) *side, quite clearly we have shared priorities. C* (Chief pharmacist) *wants drugs to be safe; we want to avoid litigation".* (General Manager)
"Pharmacy' contribution .. is via.. the control of safety and provision of a quality climate" (General Manager)

Pharmacists at some sites recognised that they had this power base.

"They (managers and clinicians and other professionals) *need us very much more than ever before, in many more ways. "* (Chief Pharmacist)
"Information is important since it confers power. He who has got information has power. We are now able to give managers enough data for them to make an informed decision" (District Pharmaceutical Officer)

Pharmacy's ability to use this power was dependent on their access to, and use of, their knowledge of therapeutics and of the use of drugs in the hospital. A further source of power was the status that pharmacists commanded in the organisation and the extent of their political activity.

8.2.1.1.4. The characteristics of individual pharmacists.

The characteristics of individual pharmacists that affected the pharmacy power base were the extent to which they were afforded high status, their contacts with powerful people, and their ability to lead and to be successful in the political life of the organisation.

At a few sites, pharmacy had a high status in the organisation.

"I have a very high regard for pharmacy here, It's one of the strengths of the whole organisation is pharmacy. " (Clinical Director)

Usually this status stemmed from individuals in pharmacy raising the status of the whole department. The clinical director quoted above traced the strengths of pharmacy back to the Chief Pharmacist. At other sites, the performance of individual pharmacists was important also in conferring status on pharmacy.

"If M (pharmacist) went the standard of care would drop dramatically here. " (Registrar)

Even pharmacists recognised the importance of this respect.

"Pharmacy is respected here because D (Chief Pharmacist) *has a high profile and he's got it over the years. A lot of consultants have been here since then and may have been SHOs* (Senior House Officers) *when D (Chief Pharmacist) started and seen D get respect from their consultants. They* (doctors) *know he runs a good department and is well respected there".* (Specialist Pharmacist)

Access to those who make the major decisions in the hospital and successful participation in the political life of the hospital were important. Several chief pharmacists had little access to powerful people in the organisation's management and others had such access but did not always use it effectively. A few sites had learnt the importance of access to, and use of, decision-makers who hold power in the organisation.

"D (Chief Pharmacist) *has a recognised position in the hospital and he does a lot with the interests of the pharmacy staff in mind. His position means we're adequately staffed. D is able to handle threats. He's got a lot of contacts and he uses them. "* (Pharmacist)

A one site the neglect of decision-makers in the past had resulted in failure to gain acceptance of pharmacy services by several clinical directorates. Consequently, pharmacy had changed their service marketing tactics.

"The whole question is "is it the CSM (Clinical Services Manager) *or the CSD* (Clinical Services Director) *or another person who has the power? The first time around we targeted the CSM because they were amenable. That was a big mistake to market to only one of them (CSM/CSD). It's very important to speak to the decision influencers like the nurses and the consultants. "* (Clinical Pharmacy Manager)
"The moral is to hit both the CSM and the CSD. If one leaves you're in deep s***. " (Clinical Pharmacy Services Manager)

Some pharmacy managers were unable to see that the holders of power were now clinical directorates and the primary care purchasers.

"The greatest challenge over the next two to three years is for pharmacy to try to ensure that it retains its post-Noel Hall (refers to the Noel Hall Report[1]) *status in the establishment. Status is everything. If you have it you can develop your service. If you become like the Chief Physio* (Chief Physiotherapists who were perceived to have lower status in the organisation) *you're dead. You see Noel Hall made the head of pharmacy directly accountable to the health authority. This gave him direct access to the chair of the health authority - that's power. "* (District Pharmaceutical Officer)

Several aspects of pharmacy power, such as access to and use of powerful contacts and information were associated with managerial skill.

8.2.1.2. Management as a pharmacy strength.

The calibre of pharmacy management varied between sites from excellent to mediocre. At most sites, management factors were weaknesses or threats. A few aspects of management,

however, were strengths. These were pharmacy managers' ability to control the drug budget and their use of technology and skill-mix.

8.2.1.2.1.   Budgetary management.

Interviewees accepted that pharmacy had managed the hospital drug budget well, even in difficult circumstances.

"Pharmacy brought the drug budget better under control although it's not perfect yet. (Clinical Services Manager)

Pharmacy managers frequently spoke of their managerial skill in this regard.

"We are financially aware. That's a helping factor. If I were a proper Chief Pharmacist I wouldn't manage the drugs budget. I currently manage it. ..as long as I get my credibility right with the hospital staff it's ok. But if the drug budget was out of control then I'd lose that credibility" (Chief Pharmacist)

"We managed to control our drug budget this year and last year and still take £50k out of it. And in terms of the DoH (Department of Health) *national performance indicators, that show the cost of drugs per patient episode, we were in the lowest 10% nationally. In terms of external detail, then, the pharmacy is successful. I have the drug budget still. General management are reluctant to give it to the clinical directorates. They think they'll make a hash of it.* " (Chief Pharmacist)

The ability to manage the drug budget was valued by several non-pharmacists and was considered to be useful, even when drug budgets will be devolved to clinical directorates.

"The hospital is so cash strapped it's good that they can give us some help by controlling drug budgets. I expect pharmacy to do that. That's their expertise. They know about costs more than we do. It's very difficult to control the drug budget yet it's very important to maintain financial control" (Consultant)

"The drug budget has been shadow devolved to the clinical directors. We look at expenditure against the shadow budgets. H (Chief Pharmacist) *is excellent at being able to tell you about spending".* (Clinical Services Manager)

Howe[18] listed pharmacy's ability to manage drug budgets, and to help clinical directorates with this task, as a strength. Khanderia[455] also found that resource management was a pharmacy strength.

Pharmacy computer systems that track drug use in the hospital, and pharmacists' familiarity with information technology, aided their management of the drug budget. Their development of systems that track drug use was a major advancement since data had been restricted to purchasing records only, in most hospitals, in the past.

8.2.1.2.2.   The use of technology.

Pharmacists used information technology to provide drug expenditure data to various groups in the hospital, such as clinical directorates. Pharmacy managers were considering the use of

information and other technology to improve services. At several site, the pharmacy computer system was being upgraded or linked to other systems in the hospital.

Some pharmacy managers named information technology as an area where pharmacists should concentrate future efforts. The possession of a good pharmacy computer system for stock control and data generation was identified as a priority by many pharmacists since it helped them to manage the drug budget and to develop information services for directorates.

"We would audit what they were doing and provide financial feedback to her (Clinical Services Manager). *The finance department only gave information when it's too late. We give it directly with an analysis. The older financial department reports are no good. "* (Clinical Pharmacy Services Manager).

In addition, pharmacy information systems can provide information for marketing and for protecting pharmacy services.

"We knew all the information. We went to them with all the costs and the answers. .. If they'd give us x amount of money for a tech and an assistant and so much for the consumables we'd do the CIVAs. We set a limit on it, the number of CIVAs per month. They were easily convinced. " (District Pharmaceutical Officer)
"Use of information gives you bargaining power. If they try to reduce staff we use intervention data to argue against loss of clinical pharmacy service. " (District Pharmaceutical Officer)

Some pharmacy managers were expanding the computer system to improve the quality of the information provided, to establish links with other hospital departments or to facilitate computerised prescribing. A number of pharmacies had linked their computer system to others in the hospital thereby giving pharmacy access to patient information that was difficult to obtain in other ways. An example was the linking of pharmacy and laboratory data systems to access drug level data for TDM (therapeutic drug monitoring) services. Some mentioned the need for increased access to, and upgrading of, the hospital information system to help develop patient-orientated and basic pharmacy services. Pharmacists envisaged the use of pharmacy computers to help them provide new services.

"PILs (Patient Information Leaflets) *is a happening thing. We're happy that the JAC* (pharmacy computer system) *will provide it for us".* (Chief Pharmacist)

Pharmacy managers were considering computer technology that would help pharmacists to remain on the wards and to increase their contact with patients.

"Computerisation is the key. If we can access pharmacy's computer from the wards using something like E-Mail and can provide adequate staff in pharmacy, assistants or technicians good enough to do the dispensing, you've got the opportunity to keep pharmacists on the wards" (District Pharmaceutical Officer)
"We're going to move to IPD (individual patient dosing) *for most things. All the labour intensiveness of IPD or unit dose is in the data collection and product distribution. Technology*

can enable us to get the benefits without the staff of the USA or the downgrading of pharmacists' roles". (Chief Pharmacist)

Pharmacists thought also that computerisation could facilitate the provision of information on drug use and costs to directorates.

"We are increasing our computerisation. Staff will find a big difference with it. .. because we will get access to .. other systems, pharmacists will be able to use programs to prepare information for presentation to clinical directors. " (District Pharmaceutical Officer)

"The major of developments in the future in this hospital will be in drug distribution and information technology not clinical pharmacy. These ones are in need of development. We are going to be under a lot of pressure to cost therapy, to look at outcome and to participate in audit " (District Pharmaceutical Officer)

Increased computerisation may lead to computerised prescribing. This was welcomed by some pharmacy managers.

"The HIS (Hospital Information Support) *system for the district has a facility for tying-in computerised prescribing. This opens up a lot of possibilities. The interactive ones* (computerised prescribing programs) *are best. The decision-making type. But you can't use it for every prescription and every patient since it lays down constraints. I'm on the committee* (looking at computerisation system in the district) *and it's a very useful position ".* (District Pharmaceutical Officer)

"I have a vision. Do you want to know what it is? Prescribing terminals at ward level. Not just order terminals, intelligent terminals that check dose, formulary status, availability, does it agree with pre-determined protocols. We will program all the data in and it will be under pharmacy's control. " (Chief Pharmacist).

Some hospital managers agreed that computerised prescribing might be a possibility.

"Pharmacy are out on their own in the sense that they've pushed out the barriers of education and development. And now in terms of information technology. He's (Chief Pharmacist) *abandoning what's a very advanced system for another even more advanced one because he sees advantages in it "* (Hospital Manager)

Some pharmacy managers, however, expressed caution about the use of computerised prescribing. It was felt to have potentially serious implications for pharmacists and their services. Pharmacy staff numbers might be reduced since ward pharmacists would no longer perform a supply function.

"Computerised prescribing could be a threat. We'll all have to change in a very big way. I envisage loosing staff. " (Chief Pharmacist)

Even the progressive pharmacy managers realised that the development of computerised prescribing would have large implications for currently-provided pharmacy services.

"I don't know if we can still operate a pharmacy monitoring service like we used to. We're a very expensive resource to monitor therapy above what a computer can do " (Chief Pharmacist).

Less progressive pharmacy managers thought that the use of computers in place of ward pharmacy was though unlikely to be successful. They had not seen computerised prescribing systems working and believed that it would not be adequate to capture the necessary knowledge.

Pharmacy managers were considering also the use of technology, other than information technology, to improve service provision.

"The big development for the future is the vacuum tube. We are getting one in the hospital and it's coming to pharmacy. I'm not as interested in it for getting the drugs to the ward but for getting the prescription to the pharmacy faster so they (nurses) don't have to wait for someone to be free to deliver it to the pharmacy" (Chief Pharmacist)

"The other piece of the jigsaw is the pneumatic tube. It will link the ward satellite to the pharmacy and give us a handle on the question of responsiveness. It will enable us to eliminate a lot of ward stock and to have unit dose trolleys at ward level. " (Chief Pharmacist)

Hospital managers supported pharmacy managers in these endeavours.

"I've been shown the idea behind his (Chief Pharmacist) latest idea, the pneumatic tube thing. Tablets and other medication can go around in chutes. I think it's great" (Clinical Services Manager)

8.2.1.2.3.   Skill-mix, delegation and staff development.

Skill mix, delegation and staff development are considered under the same heading since successful skill-mix relies on good delegation and staff development skills. These were present in many pharmacies.

Often, pharmacy managers co-ordinated service management but technicians performed the routine management of individual services. At some sites, technicians managed pharmacists rotating through their areas thereby improving the continuity of service. Several sites were increasing technicians' roles and responsibilities with beneficial effects on service efficiency and staff satisfaction. Many technicians were happy to receive more training and to assume new roles, such as those in management, training, DI and dispensary. They felt it recognised their skills and liberated pharmacists for other duties.

"I do think it's quite good that I've been given this responsibility (for a manufacturing unit). I'd like to take more responsibility for things like checking. We've a procedure for everything. I feel that once there's a procedure and it's been validated and passed I could have the responsibility. ... One of the techs (technicians) does the dispensary checking. I'm happy to do it. It depends on how confident you are and how comfortable you are in that area. I'm quite keen to broaden my education. ... Things are getting better overall I think. I'm getting involved in new things and I've been given more responsibility and have become more involved in decision-making and stuff like that. " (Technician)

The only proviso was that pharmacists needed to be sensitive in handing over roles, such as checking of dispensed items, since some technicians are anxious about taking on this role.

Pharmacy managers were keen also to increase the use of technicians. They felt that this liberated pharmacists for longer-term planning and management and improved the quality and cost-effectiveness of services.

"We will be encouraging further education to meet customer's needs with skilled staff and a skill mix that is correct" (Clinical Pharmacy Manager).

Two departments employed a dedicated secretary to facilitate the provision of drug use information. This had been beneficial for the service.

"I do the market trends for him (the directorate pharmacist) and also for the other directorates. I could list the top 10 for ITU (ten drugs on which most money was spent) off the top of my head. If you give information graphically, it really hits you. I do the annual reports for the wards. The feedback has been very good. " (Pharmacy Secretary)

Problems arose at a minority of sites where managers failed to optimise skill mix, particularly when they failed to utilise technical staff. This was sometimes, but not universally, recognised as a problem by those concerned. At one site, technicians were only utilised to perform unskilled tasks because pharmacy managers were unaware of technical staffs' abilities, lacked ideas on alternative uses of pharmacists' time and feared job losses.

"I have my reservations too about technicians and what they can do safely. With what's needed in pharmacy today you need proper supervision. In the system where you say the pharmacist just checks the prescription and never sees it again, the pharmacists, what do they do? If they don't do the dispensing and they don't make up the TPN or the cytotoxic or the non-sterile items themselves, what do they do with their time?" (District Pharmacist)

Another site had been unable to recruit and retain enough technicians to enable service provision but were aware of the problem.

Although the appropriate use and management of staff was more often highlighted as a pharmacy role by pharmacy staff, these issues were mentioned by non-pharmacy managers and professionals. Some felt that pharmacists were inappropriately used, such as in dispensing drugs. A few non-pharmacy managers thought that pharmacy staff should consider skill-mix internally in a far more radical way than they had previously. They indicated that pharmacy staff could assume new roles; ancillary pharmacy staff could take on duties envisaged for the generic health care worker and pharmacists could substitute for junior doctors in some areas. They were unwilling, however, to define the new roles.

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"We should be using the best trained people to the best effect. We should be looking at different people to do things. This extends over a whole series of areas. There's the concept of the generic health worker. With pharmacy, maybe trained pharmacy-related people could be attached to certain teams and specialise. A more flexible work force that can respond to the needs of the patient instead of a single service (is what is required)". (General Manager)

In one pharmacy, a radical approach had been taken and technical and ancillary staff were being trained as generic health workers. This was welcomed, and supported, by the general managers.

"We've been impressed with .. how innovative he (Chief Pharmacist) *is with technicians. He's very keen on training them .. He uses them as generic health care workers".* (Hospital Manager)

This Chief Pharmacist was considering new roles for his staff.

"Opportunities exist for us to take on the roles of the nurse that they're leaving behind like drug administration. ... Perhaps have a pharmacy technician doing the oral drug rounds. It's less costly than a nurse. " (Chief Pharmacist).

A reassessment of pharmacy skill-mix was advocated in a DoH-commissioned study published in 1994[446]. Concerns were expressed that some overlap remained in tasks performed by pharmacists and other pharmacy staff but no suggestions were made regarding the new roles that technicians and other pharmacy staff could adopt. In this interview survey, the author found that most pharmacies were optimising skill-mix and had successfully delegated tasks to technical and ancillary staff. Nevertheless, other aspects of delegation and staff development had been addressed less successfully.

Delegation is the process whereby a manager assigns to others the responsibility and commensurate authority necessary for the achievement of a specific set of objectives. This is a two-way activity that should include the following steps: clear assignment and delegation of appropriate responsibility for an activity to the subordinate; acceptance of the obligations by the subordinate and satisfactory completion of the task[456]. Difficulties may arise if any step is flawed. Superiors may fail to delegate effectively due to fear of loss of authority, fear of taking risks, failure to identify tasks that could be delegated, unwillingness to provide additional training for subordinates and failure to ensure that the subordinate is capable of carrying out the activity. Problems may arise also if the subordinate is unwilling to accept responsibility or to make decisions. This may be due to fear of criticism, or lack of self-esteem, motivation or authority. Specialisation may provide workers with expertise that increases their ability to perform tasks unsupervised thereby increasing efficiency in the organisation. Although superiors cannot delegate accountability, by delegating responsibility

they can increase subordinates' motivation and job satisfaction. This is thought to occur as a result of the transfer of responsibility increasing trust, facilitating personal development and increasing awareness of the problems of the organisation and of the manner in which sub-units integrate into the organisation[457].

Many pharmacies were addressing the issue of skill mix and were delegating tasks effectively. At these sites, technicians had developed their role and had assumed responsibility for day to day management of areas of the pharmacy. This had created the potential for conflict between pharmacists and technicians. Where conflicts existed, they arose from difficulties in delineating technician roles from those of pharmacists, in providing technicians with guidance on the extent of their responsibilities, especially where pharmacists were insensitive and sought to dominate, and in balancing the training needs of junior pharmacists with service efficiency in specific areas, such as compounding and dispensing. Sometimes friction had been caused by technicians who were beginning to develop an expanded view of their professional role. In most departments these problems were rare because of good management of role changes and delegation. Usually, there had been attention to detail in delegation and staff development and motivation.

"The biggest thing is that they must feel job satisfaction from the patient care aspect. Even if it's a mundane job in the background. They need to be told regularly that what they've done has helped patients. If someone's done a good job we let them know. For example we've had patients come back to show us their children and thank us. That's got to be fed back to the staff. Any that are around are left know that the patient is here so that they can also bask in that feeling. It's encouraging to do that. It does have to be worked at. " (Chief Pharmacist)

Problems were rare also because technicians usually had to be encouraged to assume new roles. This reticence may, however, be disappearing. There was evidence that technicians, increasingly, are identifying themselves as a group that should be managed by technicians and which has a particular contribution to make in patient care.

"I'd like to see more patient counselling and patient contact on the wards. The technicians could take it on if we got time. " (Chief Technician).

The selection of appropriately-skilled staff was an important factor in service provision. At a site with contracted services, pharmacy managers took great care that the staff that were employed were suitably skilled thereby ensuring that the service would match the requirements of pharmacy contracts.

"We look for people who socialise easily (to be directorate pharmacists). *So it's extremely important to employ people who socialise more like the traditional doctors. "* (Specialist Pharmacist)

Pharmacists' skills were matched to contract requirements.

"I think pharmacists are comfortable practising that level of ward pharmacy which is proportional to their level of knowledge and expertise. What we try to do is a bit difficult .. We try to match the level of the staff to the needs of the service so people are working at their capacity at the ward level. The directorate pharmacists (provide services under contracts) *are generally grade C and above* (more senior pharmacists) *and the basic ward work* (services not provided under contract) *is done by grade B* (junior pharmacists) *operating at the lower end of the clinical pharmacy spectrum .. it gets tricky when people leave.* (Pharmacy Services Manager)

In addition, formal grading procedures were in place for junior staff thereby demonstrating

that a system to assure the quality of pharmacy staff was in place.

"One thing that's different here .. is you have a formal assessment to go to B grade (when one is promoted from A grade). *It's for my benefit. If I'm not up to a certain standard I don't move up. "* (Pharmacist)
"There's the A to B grade assessments. Since we've got service agreements he (District Pharmaceutical Officer) *therefore felt that he needed . to prove there was a system of assessment operating.* (Specialist Pharmacist)

At some sites, pharmacy managers were less adept at delegation and staff development. This

was due partly to a lack of leadership. At one site, this had stifled junior pharmacists'

attempts to provide a clinical pharmacy service.

"If I were in charge I'd put the principal pharmacist in her office and make her delegate and manage and not have her pushing a trolley around the pharmacy. I'd get the whole management structure sorted out. I'd sack the technician. He wasn't a properly trained one to begin with .. and he is more or less useless and get two assistants, or two technicians if possible, to replace him. At the moment nobody is really responsible for anything. I would send the principal pharmacist on a time management course. I feel that I spend a lot of time pushing trolleys around and topping up, things that an assistant could do. " (Ward Pharmacist)
"The former District Pharmacist was not a good manager. He wasn't up to the job. He didn't want to allow clinical pharmacy to start because he didn't want to take on the responsibility if something went wrong. It set clinical pharmacy back 10 years. He took no notice of the circular (The Way Forward[24])*".* (Pharmacist)
"When I came here the former chief pharmacist wouldn't delegate. The present one is no better " (Ward Pharmacist)

8.2.2. Pharmacy's Weaknesses.

Pharmacy's weaknesses were due to pharmacy management factors, pharmacists' lack of

confidence in their abilities and the value of their services, their unwillingness to accept

uncertainty, and their resistance to true multidisciplinary working, and the physical structure

of pharmacy departments.

8.2.2.1. Pharmacy management factors.

Pharmacy management posed problems because of managers' lack of vision, their failure to lead their departments, and their failure to assess strategically the needs of the organisation, to react to these needs and to implement change. Not all sites had poor pharmacy managers and not every aspect of pharmacy management was poor. Section 8.2.1 considered managerial factors in pharmacy that were strengths, such as their budgetary skills, and their ability to use technology and skill mix to effectively manage the pharmacy service. In each section below an aspect of managerial ability that was a weakness in the majority of sites will be addressed. A general description of the issue will be followed by a discussion of its relevance to pharmacy. The managerial factors cover large areas of management science; only a brief overview of this is provided.

8.2.2.1.1. Assessment and meeting of organisational need.

Organisational objectives are formed by senior managers. These objectives are frequently broad and departments are responsible for their implementation. Implementation involves the assessment of organisational need based on organisational objectives, consideration of other changes that are taking place, and forecasts of change. Departmental managers need to carry out an assessment of the needs of their customers and the manner in which needs can best be met. Briefly, this may involve assessments of past records of service use, of records of complaints and of requests for services, of government and other publications that indicate possible future directions that services should take and customers' opinions on services[447]. Following an assessment of the organisation's needs, managers must create a vision of the department's future and lead it to ensure that this vision is realised. Services may have to alter to meet needs. This may involve change, vision and leadership, which are addressed in the next sections. Here, the assessment and meeting of organisational needs is considered.

A number of pharmacies, all of which were in hospitals with clinical directorates, had tried to assess the needs of their customers. Usually the assessment of needs was not open but was heavily biased toward services that the pharmacy wanted to develop or provide.

"We've chosen to develop services where we're appreciated. We don't provide cytotoxics compounding. Why? Because the haematologists resisted it. Instead services have been developed to SCBU (Special Care Baby Unit). .. SCBU were on their knees asking for a service. Better to please those that appreciate us than those that don't" (Chief Pharmacist)

It was claimed often that this manner of assessing service needs was necessary since non-pharmacists did not know what they really wanted from pharmacy.

"People are not coming to tell me what to do. Opportunities there are but not necessarily on a plate for me. I have to spot them. ... Sometimes clinical directors cannot articulate where changes in demand can be reflected in pharmacy services." (Chief Pharmacist).

Pharmacy managers at two sites sought to determine if the directorates would accept the services and, for some or all services, if they would pay for them. Marketing was often used to assist with the sale of services that pharmacy felt a directorate needed.

"You go with a blank piece of paper. You mention the services like CIVAs (Central Intravenous Additive service) *and try to identify the customers needs. You sell them what they want and never discuss prices. We use the CSMs* (Clinical Services Managers) *elsewhere to market the service by showing their satisfaction with us. Throughout the discussions you know whether they need it or not* (a service). *The clinical directorate pharmacists know the pharmacy business plan and try to line up the services on offer with it".* (Pharmacy Services Manager)

At most sites, however, the service mix offered was that decided upon by pharmacy apparently independently of any assessment of customer needs. The motivation for service provision was often unclear. Some senior pharmacists said it was a combination of what was useful for pharmacy and good for the hospital.

"How do we select which service to develop? It's what's good for you (pharmacy) *and what's good for patients."* (Clinical Pharmacy Manager)

Often pharmacists assumed that they knew what the customers (directorates) needed.

"We haven't agreed with each clinical director what the service they get will be. I've determined what they're getting and agreed the financial end of it. We've discussed their varying needs in pharmacy. The problem is that when they start off they don't know what they want. All they know is that they want a service. But you (pharmacist) *know what their need is and how it varies."* (Chief Pharmacist)

Pharmacy was commonly self-centred in the development of services and put pharmacy staff needs before the needs of the hospital.

"We can't put a pharmacist on orthopaedics, its too boring". (Clinical Pharmacy Manager)

Some pharmacy managers believed that service development depended on hospital politics and was outside their influence. Others thought that pharmacists could use political agendas to their advantage.

"Services develop when time is right politically. For the last 4 years I've been trying to do this (develop acute pain service). *One day I'll learn a service starts when God wants it to. Here it was the visit from the College of Anaesthetists that did it".* (Chief Pharmacist)
"Pharmacists have got to be politically astute, to learn to adapt to spot where priorities lie like the move to primary care at the moment. .. you've got to adapt the service to what's politically on the agenda (of managers and doctors)*".* (District Pharmaceutical Officer)

Many non-pharmacists felt that the reasons behind the development of pharmacy services were

remote from patients' needs. Pharmacists provided services that saved money rather than enhanced care, spent relatively little time on the wards or in patient contact and did not bother venturing into outpatient departments. Doctors saw real needs in these areas that pharmacy failed to meet. Some had requested services and, when they were not provided, assumed it was due to a lack of time but this was not always true.

"One area that doctors and pharmacists have not explored very much is patient's understanding of drugs. They've got tremendous problems with drugs. There could be more patient education for what the drugs are for. They do it on request but not otherwise."
(Consultant)

Nurses at a number of sites felt that there was insufficient consultation with them on service provision and on problems in service delivery.

"No-one ever said "what do you want?". I've had to say what I don't want. That's a very negative approach. ... I don't feel I have any control over the quality of the service. .. On the whole it's pretty good. There have been gaps though. There was a problem with one pharmacist. She just wasn't doing the job. I used to go to the pharmacy every week and have a meeting with C (Chief Pharmacist) to complain but nothing was ever done". (Ward Sister)
"People don't ask us questions about the service we want. We haven't sat down and said we'd like pharmacy to be contracted for X and the pharmacist to stay on the ward for X. Pharmacy decided what we were getting and that was it". (Nurse Manager)

Khanderia[455] reported that some clinical directors felt that pharmacy failed to recognise the directorate's needs. They perceived this as a pharmacy weakness. For example, although almost half the clinical directors interviewed in her study thought that the financial information provided by pharmacy was useful some though that it was lacking in detail. In addition, 8/10 clinical directors had not been consulted by the pharmacy regarding their requirements although 9/10 chief pharmacists thought that clinical directors should be consulted.

A few pharmacists were aware that their service was not meeting their customers' needs but the majority did not consider this issue. This was particularly so for supply services. Some pharmacists thought that responsiveness to all requests was a positive aspect of pharmacy services but others were not so sure.

"We are viewed as a group who rarely say "no" when we are asked to help. I hear it from the consultants and from the senior registrars. We are perceived by them as being there to help. It may be one of our weakness." (Chief Pharmacist)

Health professionals appreciated pharmacy listening to their requests and trying to find solutions. However, where services were determined mainly on a reactive basis, generally due to a lack of vision and of an overall service strategy, the results were pharmacy staff and customer discontent and a service not meeting hospital-wide requirements.

8.2.2.1.2. Vision.

Vision is the possession of foresight and the ability to predict future need. It is related to the assessment and meeting of organisational needs, but it focuses on longer term needs.

The extent to which the DPhO (District Pharmaceutical Officer) and chief pharmacist had a vision for pharmacy had profound implications for the service. In the main, vision was lacking and managers were merely reacting, often at a late stage, to changes in the organisation. Pharmacy managers at most sites did not express a vision for the future and were often pessimistic about it.

"What opportunities exist? None" (Chief Pharmacist)

Lack of vision led to a lack of clear strategy, services poorly tailored to need and low morale. The resultant deficiencies in service planning meant that their provision was on a reactive basis depending on customer demand and pharmacists' initiative and time.

"At the moment I interact with three of the eight consultants that have beds on my wards. I do DI queries, costing information and drug comparisons. I only do it for the ones I know, the friendly ones". (Clinical Pharmacy Manager)

Junior pharmacists seemed to be aware of the problem.

"We need a strategic plan from the top in pharmacy. ... Why we are not doing the things we could be doing, why we seem to do only ward pharmacy and DI and the things in HC(88)54. Maybe there's too much choice and too little guidance". (Clinical Pharmacist)

Often, where there was a vision, it derived from the pharmacy manager's personal ideology. Hence it may have been inappropriate to the needs of the organisation. "Empire building" typified this type of vision and was present in some pharmacies. This meant that services were developed to increase the pharmacy manager's power within the pharmacy and the hospital. This was achieved by creating a pharmacy business, rather than by developing services to meet the hospital's needs.

"That was a real problem in the past, empire building with each chief pharmacist building their own. That wasn't good. We've had to change to what's needed." (Chief Pharmacist)

Some pharmacists felt that trusts might foster this tendency to the detriment of pharmacy services in general.

The failure to assess and meet needs and the absence of a vision for the future of the service led to a failure to initiate and manage change in hospital pharmacy

8.2.2.1.3. Initiation and management of change.

Adaptation to change is necessary for the survival of organisations but change management is often difficult, traumatic for those involved and can be a lengthy process. The need for change can be brought about by external or internal environmental factors and the adaptation to change must be based on correct assessment of these factors. Change may occur as a result of planned expansion, unwanted decline, and changes in the market. Change involves friction, often due to resistance to change within the organisation[456].

The causes of resistance include inertia, ignorance of the context of the proposed change, fear and objections to the process of change. Inertia may be due to a natural desire to maintain the *status quo* since many are more comfortable with a state where working practices remain constant. There may be strong beliefs that change may worsen working conditions and practices and may be bad for the organisation. Large, complex, bureaucratic organisations often display greater inertia than smaller ones since change may cause the loss of people and structures. Ignorance of proposed changes may stimulate resistance. This can be caused by poor communications or lack of knowledge of the changes in the environment that affect the organisation. This is a particular problem when the change is made in anticipation of environmental change. A further factor may be a perceived lack of alternatives to the proposed change process[458]. Fear of change is perhaps the main factor that causes resistance to change. This may stem from fear of the unknown, particularly where the implications of change have been inadequately discussed and communicated, fear of status loss, which is associated with a reduction in privileges, benefits and earnings, fear of inadequacy, of one's potential to adapt to change and of helplessness, especially where change may lead to job losses (for example, the introduction of information technology), fear of increased exploitation (such as an increased workload), and fear of increased control and supervision by superiors[457]. Resistance may be a problem if changes are introduced without the provision of adequate information on the reasons for change and on the change process and if there is a failure to consult with all relevant staff and their unions[457].

There are several strategies for implementing change and for dealing with resistance. One such method is the creation of a plan for change[459]. Although this will not be discussed in detail, it includes strategies to reduce resistance such as education, communication, participation, involvement, facilitation, support, negotiation and agreement. Other strategies, which involve explicit or implicit coercion and manipulation, are also available. Planned

change permits the involvement of workers, thereby increasing motivation and the chances of successful change and may entail job changes, training and motivation[458].

To manage change there must be a realisation that change is required. This may stem from an assessment of needs or from an awareness that something wrong with the current service. Some pharmacy managers and pharmacists recognised that the service was not ideal. For example, it was often available at inappropriate times in the patient care cycle.

"We don't understand patient processes and prescribing. When is pharmacy needed? If you look at the admission process a lot of the prescribing is done at the end of the day, when the pharmacy is closing or after we have left the ward. " (District Pharmaceutical Officer).
"We're 9 to 5 people. We think it's 5.15, so I've got to go home. " (Specialist Pharmacist)

The need to alter services was much less well-recognised by most pharmacy managers who thus were not initiating change. This was typified by the provision of an unresponsive nine to five service, driven by the demands of ward pharmacy, with ignorance of day care facilities, lack of out-patient involvement and failure to promote services and to communicate with customers in primary and secondary care.

"My attitude is don't fix it if it's not broken. With the medical staff here, we don't have any problems with them. I think they approve of us. If they want anything they'll ask for it". (Chief Pharmacist)

Even where pharmacy managers knew services were less than perfect, they were not initiating the necessary changes but this was recognised as a problem at only a few sites.

"The problem, if we have it, is that we don't change fast enough. " (District Pharmaceutical Officer)

Using the example of out-of-hours services, pharmacy managers were making little effort to improve their availability or quality, even where there were recognised problems. It was unclear why this was happening although some pharmacists suggested reasons.

"If we were logical we'd provide a 24 hour service. Why not? Because it doesn't suit us to. Is it reasonable? No, I wouldn't say so but the attitude to work, even to pharmacy work, is not what it used to be. We need a lot to persuade pharmacists to offer something like flexitime. " (District Pharmaceutical Officer).
"We're quite happy with our cushy number. " (Clinical Pharmacist)

Other areas where change was felt to be needed but was not happening included the promotion of services to customers in primary care, the change to a more patient- and customer-orientated service and the provision of information to hospital managers on the contribution made by pharmacy to patient care.

"Hopefully we will eventually be more aware of drug taking with patient counselling. They say you get more instructions with a video camera today than with your drugs. " (Ward Pharmacist)

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A minority of pharmacists were concerned about the lack of action in these areas.

"At the moment I'm desperately trying to increase the profile of pharmacy in the community trust. Where I haven't been involved, they don't even ask for a pharmacists to be involved." (Community Services Pharmacist).
".. it's difficult because we're all under pressure and it's easier to be reactive and not change what's going on. We've got to stop and see what we're doing is right and if it is we've got to keep doing it." (Chief Pharmacist)

The lack of initiative to change was exemplified also in pharmacists' failure to educate customers about pharmacy services. Pharmacists often commented that their skills were likely to be under-utilised because clinical directors, nurses and doctors did not know what they wanted from pharmacy, nor what pharmacists did. However, they rarely took action to remedy this. Pharmacy services were only defined at one site (where there were service contracts). The reasons given for not defining the service at other sites were not having the time to do it in the midst of profound and ongoing change and reluctance to define services in case it tied the pharmacy to providing that level of service.

"We determined their basic needs and we haven't determined (defined) it to them. I don't like writing it down because we may not be able to deliver." (Chief Pharmacist)

Pharmacists also failed to increase their visibility on the wards and thereby to educate others about the services that they provide.

"I'd like to see more ward-based not department-based pharmacists to enable pharmacists to know enough about patients to influence their care. The problem is we haven't found a way to keep pharmacists on the ward long enough to do more. We tend to be visitors. That's the main constraint and it's a time constraint". (District Pharmaceutical Officer).

Non-pharmacists found that their lack of knowledge of pharmacy services was a problem.

"I feel they have the right amount of knowledge although I've no idea what the grading and hierarchy is. I don't even know how pharmacy is laid out regarding the grades and career structure. I'd like to be told that so I can grade the information that I get on the expertise of the provider and their seniority." (Clinical Director)
"The problem is, because we don't know what the pharmacists duties are, we don't ask (pharmacist to do other work). What I do know is they check the drug charts and may go on the ward rounds. It's the other areas, the grey areas, we just don't ask them, we don't know if we should." (Registrar)

Non-pharmacists said that they often felt that pharmacy managers failed to recognise problems with pharmacy services or patient care or, if they did, failed to make the necessary changes. Problem areas included the inappropriate availability of pharmacy services, the poor quality of out-of hours services and the absence of other services.

"Despite having a huge pharmacy department here the dispensing of drugs is the slowest and most complicated process. Patients often have to go home without them (their drugs) and come

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back for their tablets". (Senior Registrar)

"Some things, like the pharmacy opening 8.30 to 5, are not appropriate. Some clinics work after five. I said 'It's not a very consumer led service. Why not open 9 to 5.30?'". (Business Manager)

Why we don't have an 8 to 8 service from pharmacy I don't know. I object to the fact there's no pharmacy service." (Senior House Officer)

"We have no feedback on why we use antibiotics, for instance, and no rationalisation and proper use of drugs. There's a computer system in pharmacy but it does not give us costs. It's an obvious areas where they could do more" (Clinical Pharmacologist).

"Pharmacists don't speak to clinicians enough. We can't access pharmacy now. It's all locked in. It's a big barrier. You've got to get an id (identity card) to get in. It's a problem, security, but it's a most off-putting approach. I don't bother going in there now. If they're going to shut themselves off and insulate themselves it's not the best approach. It gives the impression to the rest of the hospital that they don't want to get involved. It won't maximise free interchange of views and ideas and collaboration" (Clinical Pharmacologist).

Doctors and nurses sometimes asked for services but these were not provided, or were provided only when requested despite an ongoing need, for example counselling, TDM and education of professionals.

"When patients are on complex IVs like chemo (chemotherapy), *they should be made up by pharmacy. It would be better for us and for the patients. I suppose it's regard as trivial by them. Maybe they don't regard it as important".* (Clinical Director)

Managers did not know why pharmacists behaved in this manner but they pointed out that no change can be achieved without pharmacy support. They emphasised the dangers of complacency in pharmacy management.

"The threats to pharmacy are from complacency. It comes from the profession itself. It's partly because they don't know and partly because they don't believe the way the health service is moving. That requires evidence and by then it's far too late" (Business Manager, Support Services Directorate)

Non-pharmacists frequently said that pharmacists could do much more if they pro-actively offered services rather than waiting to be asked for them. This applied to services such as the provision of information, audit, DI, counselling and self-medication.

"In the future I'd like them to tell me much more about the cost of drugs and the drug budget every month or even annually, like the principal spenders, the antibiotics, IV feeds and fentanyl. More information, I'd like that, and to tell me how to change so that I can reduce expenditure and give advice on how to do that. .. although at their best they're very good, they could have taken the initiative here and provide the costings of the service once every 3-4 months and give us some idea about modifications." (Clinical Director)

At a minority of sites pharmacy was actively managing change in line with organisational need.

"I look to see what changes are taking place outside and see how pharmacy fits into that. It sets the pace for pharmacy development. It all boils down to seeing how pharmacy meets the objectives of the organisation" (Unit Pharmacy Manager).

At such sites the chief pharmacists were trying to develop services that were thought to be required by customers before being asked for them.

"I'm involved with a ward group on CIVAs. We won't get involved unless we get funding. The managers are not bothered about safety or quality at present and there's no money available for it. So I'll have to do an options appraisal on the different things that are available including quality of preparation and litigation and risks" (Specialist Pharmacist).

"Our biggest opportunity is responding to our customers. We discussed funding more pharmacist time to release them to work on the medical directorate overspend. I discussed it with their business manager. " (Chief Pharmacist)

This approach had been well-received by customers.

"The involvement of pharmacy in the pain service was facilitated by personal interest and contact initiated by pharmacy. " (Consultant)

At one site, the most senior pharmacist was very politically aware and open to change. He had managed the pharmacy during a very difficult period of change and the service was now robust.

"My major activity is strategic and general planning. All the time we're riding on the coat tails of the clinical directorates. I'm a provider for a provider, the main providers of the organisation. So what I do has to be led by them. I've got to provide what they need for their service agreements. Any new monies for the trust or the clinical directorates comes through that mechanism, therefore if the purchaser doesn't buy it's no good me having aspirations as a pharmacist. In practice that's not a problem. Whatever the development is there's nearly always some pharmacy contribution. It's merely a question of is it a routine boring in-patient, outpatient dispensing or is it more exciting like CIVAs, PCA (patient controlled analgesia), pharmacy contribution to better discharge. " (Chief Pharmacist)

His awareness of politics in the hospital and in the NHS helped him maintain and market an integrated pharmacy service.

"We worked on two principles. Sorry, pharmacy have always been nice guys but we're going to bite the bullet. We withdrew our service from certain areas. Some pharmacists were very reluctant to do it but I took that decision. Even though it was a very hard decision to make I thought you had to take the longer view. The other decision was to regard it (the pharmacy service) as customer led. " (Chief Pharmacist)

He was prepared to optimise the effects of the external change for pharmacy.

It's a hell of a lot easier now because of the purchaser-provider split. Before the district management were very reluctant to fund any central initiatives. Unless we could link it to some overall development we couldn't get money for pharmacy. " (Chief Pharmacist)

At another hospital the chief pharmacist had become a clinical director and was better able to lead the service through a period of considerable change and threat. At these sites, the opportunities presented by the internal market to fund services, such as home care and CIVAs, were being exploited.

Pharmacy's failure, sometimes, to initiate service changes in line with clinical directorates'

needs was implicit in Khanderia's study of pharmacy services to clinical directorates[455]. She found that short opening hours were viewed as a problem by chief pharmacists and clinical directors yet nothing seemed to have been done to resolve the problem. Her study also found several other examples of failure to initiate change despite shared perceptions of need, such as the need to increase patient contact and assist patients in their use of medicines. In the present study the most successful sites had managed change in their service in line with organisational need. Leadership was also an important factor at some of these sites.

8.2.2.1.4.   Leadership.

Leadership is an aspect of management. Good leadership is thought to involve using power, having the capacity to control situations in an organisation, and influencing the behaviour of others. There are many theories of leadership, ranging from early theories that described the traits that leaders were thought to possess to more recent work on leadership styles. Theories that are useful in one context are not necessarily helpful in another[460]. One model of leadership that helps us understand the situation in hospital pharmacy takes into account the interaction between the need to perform the task, the need to maintain the team and the needs of individuals in the team. The leader must ensure that the functions that satisfy these three needs are performed. These include planning, initiating, controlling, supporting, informing and evaluating staff or activities. The extent to which, and the manner in which, the leader may share responsibilities depends on the leader's characteristics, those of subordinates, particularly if their skills and experience are sufficient to perform the task, and the situation, which includes the importance of the task and the rapidity of change in the environment[461].

There were leadership problems at several sites. Pharmacists at junior and middle levels often felt unhappy with the service and a minority identified the real problem as a lack of leadership.

"There's no leadership from the top from pharmacy management. We're waiting for the others to ask for services. We're not pushing services. I feel we lack direction.". (Clinical Pharmacist)

"D Chief Pharmacist) takes on more than we can handle. And he doesn't consult us about it. One of the problems is he is not managing us and giving directions from the top." (Pharmacist)

"He (Chief Pharmacist) makes promises and never keeps them, is forgetful, does not follow things through. There's no direction or leadership. I don't feel supported by him. There are things wrong here but we're never going to solve the bottom without solving the top first. Here am I, motivated, but I've got no support to change things. He's never around, and when he is, he doesn't really see the problem to the full extent". (Pharmacist)

Even within these departments, good leadership was observed within sections of the

department. At one site, for example, where the overall leadership was poor, the Chief Pharmacist took an interest in the clinical team and the service provided by that team was excellent.

"C (chief pharmacist), leads from the front and there are lots of opportunities. She is on the ball, asking for things, seeing that things are done. " (Clinical Pharmacy Manager)

Despite the excellence of one aspect of the service, however, the Chief Pharmacist's failure to lead the overall service had resulted in poorer quality non-clinical services, lack of co-operation between clinical and non-clinical members of the pharmacy department, low morale amongst non-clinical pharmacy staff and overall dissatisfaction amongst pharmacy's customers with several aspects of the service.

"The supply service is poor and this gives a bad impression to the customers. If you have delays like four hours your service is perceived as rubbishy" (Clinical Pharmacy Manager)
"The clinical pharmacists' contribution to patient care occurs right throughout drug use except for dispensing and physical supply. It's primarily in the step before dispensing. " (Clinical Pharmacist)
"We're not clinical pharmacists. We are just dispensary pharmacists. We all provide a clinical pharmacy service but they get the glory. I don't go on ward rounds because I don't have the time to do them and it's not a requirement of my diploma in clinical pharmacy. " (Resident Pharmacist)
"The CIVAs service made a great difference to patients getting the dose on time. Sometimes patients could miss two to three doses. But CIVAs is not available out of hours so it is still a problem to get doses to patients then. .. at night and over the weekend it's back to the situation where doctors have to do it. The pharmacy service is not available (then)". (Staff Nurse)

At a few sites, the overall leadership had been better. The services at these sites were more co-ordinated, the staff were more content, confident and motivated, and the customers were more satisfied. The style of leadership varied but, in all cases, the pharmacy manager was able to identify the objectives of the service, to motivate the staff to behave as a team, and to help them develop as individuals. At two sites, in particular, good leadership was seen. In both cases pharmacy staff co-operated to produce a good quality service. The pharmacy manager had identified the goals of the pharmacy organisation and made them clear to all.

"My job is to manage the day to day running of the pharmacy service through the people under me so as to keep the show on the road. My major activity is strategic and general planning. " (District Pharmaceutical Officer)
"A lot of the success in the department is that all members contribute to the process. Ideas are mulled around until there's a consensus. If a consensus isn't reached then the manager, Mr B (District Pharmacist) makes the decision. It's a matter of balance. Clinical pharmacy services are very important but other areas have to be looked at too. We, the non-clinical services, and the clinical services shouldn't be split. We facilitate each other's development. They couldn't do what they're doing without us and we'd die without them. (Specialist Pharmacist)
"D (chief pharmacist) is good with the staff. He does a lot with the interests of the pharmacy

staff in mind. At C (a nearby hospital) *morale is low. They're carrying people and they're understaffed. Here we've enough staff. He's* (chief pharmacist) *in control but everything is kept very very open even with the management reviews and as a result we were barely scraped compared with other directorates. It was probably also because we'd streamlined our services before that. "* (Specialist Pharmacist)

"As far as I'm concerned we're all equal as people doing our own thing. I've always worked on the basis that it's my role to facilitate the role of pharmacy in the hospital, to give it the best pharmacy service. " (Chief Pharmacist)

"I've had great difficulty with keeping the service coherent. I've given people managerial responsibility for a section of pharmacy and a directorate as well. So it's choosing people to fit the job. When I pick them they've got to have a good basic clinical background and they come in to manage a key area. " (Chief Pharmacist)

"If we provide a good service and give guidance to staff we can shape the service and be pro-active rather than reactive. (Chief Pharmacist)

Various teams were meeting individual goals but the overall team spirit was preserved by constant attention to detail.

"As for the absence of a pharmacist-technician split. That's achieved by active procedures. We've taken people and given them a role and told them what that role is. And if we do get people in with the attitude that they're different and have different roles then they're sat on. It's as simple as that. It has to be worked at. It doesn't just happen. I have to do it to a large degree. It has to come from me and from the senior staff who fortunately agree with me on that. Otherwise you are employing the wrong people for the job. " (Chief Pharmacist)

"The morale issue; again it has to be a positive thing. I am there to protect people from the negative things as far as I can and there's been a lot of negative things. I try to make sure people know what's happening when I can. If there are difficulties we try to face them together. The biggest thing is that they must feel job satisfaction from the patient care aspect. " (Chief Pharmacist)

"I involve all my senior staff in the business planning exercise so that helps integrate the service and they get more ownership. It's not just me dictating what happens. I don't tell them what to do at all. They tell me. That's the way it works. When we go to a pharmacy business meeting, sometimes the directorate pharmacists ask the questions the purchaser would have asked if they had been there. The problems you have to avoid is one that the directorate pharmacists don't see themselves as the elite and look down at the people here in the department as boring. The other potential problem is that the directorate pharmacists can have conflicting loyalties and that can be a problem. They may identify overmuch with the directorates at the expense of the department. So we discuss this openly like the time we had the question about the costs of the TPN service. That was a problem for some of the directorate pharmacists. So it came up in a business meeting and I explained how I calculated the on-cost (costs additional to the cost of the medicines, such as labour costs) *to them very clearly. "* (Chief Pharmacist)

Staff development was facilitated at sites with good leadership. Staff development and delegation were addressed as a strength in Section 8.2.1.2.3.

8.2.2.2. Pharmacy staff's lack of belief in their effectiveness and the effectiveness of their services.

Non-pharmacists were increasingly requesting pharmacists' input in TDM, pain control, DUR

(drug utilisation review), CIVAs (central intravenous additives), DI (drug information) and advisory services. As a result, pharmacists generally believed that their services were needed and acceptable. Although this should have resulted in increased confidence in pharmacy's ability to deliver services that contributed to patient care and cost effective drug use, in many sites this had not happened.

Pharmacists were surprised at the extent to which their services were valued, and their advice was accepted, by senior doctors where they had tested these issues, for example by presenting pharmacy's contributions to care at multidisciplinary audit.

"The regional intervention-monitoring survey gave very good and very valuable data. It raised our credibility. Even though they (the doctors) aren't paying for it (pharmacy services) but they knew what we were doing." (Chief Pharmacist)

"When we reported on the pharmacists interventions to the renal people they asked us why was our advice not (always) taken. In each case (where pharmacists advice was rejected), he (the renal consultant) sided with pharmacy. That threw us. It implies that he believed us more." (Chief Pharmacist)

In some cases, the lack of belief in their contribution to care had contributed to pharmacy's reluctance to contribute to multidisciplinary care.

"To be perfectly honest I often don't feel I do contribute to patient care as an individual. I have quite a lot of input but I don't feel that I contribute to a huge extent." (Specialist Pharmacist)

"I rarely volunteer anything. Most of the time that I would see that some junior had written something up wrong I'd say it to the junior after the ward round. Most of the time I give my opinion if I'm asked". (Ward Pharmacist)

Some also doubted their acceptability on the wards and worked very hard to become part of the team by, for example, helping control costs.

"L (ITU pharmacist) has expanded her role. She's been very lucky with M (the new consultant). He's very cost-orientated so it's been easy for her to find a way in." (Clinical Pharmacy Manager)

This approach was criticised by non-pharmacists who thought that inhibitory factors, such as medical power, should no longer be a problem for pharmacy.

"They could provide more support for doctors and nurses at a practical level. The DIC (Drug Information Centre), it tends to be a reactive rather than a proactive process". (Consultant)

"They were, and I think they still feel threatened by the medical mafia. ... A newer generation of consultants have come here. They are young and energetic. They don't have quite the same reactionary feelings as their older colleagues. They look more to their colleagues in other disciplines for help." (Unit General Manager)

Pharmacists often believed that further education would improve their skills and knowledge and, thereby, increase their confidence.

"I don't think that my clinical knowledge is brilliant and .. especially if I was doing wards, it needed to be better. That's why I did the diploma. It gives you confidence and makes you do a better job. " (Specialist Pharmacist)

At several sites, older pharmacists commented on the improved status afforded to pharmacists that they felt that had been earned through better education.

"You have to earn your stripes, to be seen to actively contribute to patient care, cost effective patient care. " (District Pharmaceutical Officer)
"The basic level of clinical competence has improved, particularly in the B/C (junior) grades. It arises from a very good Part I (Diploma in Clinical Pharmacy) course. " (Chief Pharmacist)

Another method used by a number of pharmacists to address their lack of confidence in their role was an aggressive, rather than assertive, approach in their dealings with junior doctors. A number of doctors commented on this.

"The natural reaction from all paramedical professions including pharmacists is that, and it's both peoples fault, all these people think that doctors are looking down their noses at them. And in some cases it's probably true but, since they assume it, they pick it up more easily. It makes for a bad team. It's a great shame really since house officers are wandering around clueless about drugs and you can't expect them to be any better" (Junior Doctor)
"There doesn't seem to be a division between the professions on status. It simple really. Here, the pharmacy thinks it's better than us. There's been problems, lots of problems in the relationship with them. It hit me like a plank when I came here. Lots of people have said it. It's awful. It's the worst place I've been. " (Junior Doctor)

Disagreement in pharmacy about the value of some services, such as patient counselling and ward rounds, worsened matters, particularly if pharmacy management was poor.

Nevertheless, pharmacists at some sites felt sure that they could prove that pharmacy services contributed to care and the cost-effective use of medicines. Those at the site with service contracts did so routinely.

"Everywhere else wanted to continue with the directorate service after a year and were full of praise for what pharmacy were doing. Eighteen percent of the pharmacy staff money is non-recurring. The clinical directors could take it away but I'm not afraid of that. " (Pharmacy Services Manager)
"M (Clinical Pharmacy Manager) says that we've saved £9 million due to the formulary since it started in 1983. I wouldn't claim that the formulary alone has done it, I wouldn't be that brave, but I would claim that our role in producing drug formularies is effective. " (Specialist Pharmacist)
"We use the CSMs elsewhere to market the service by showing their satisfaction with us. You can't sell a service unless you have the information to support it. It's all about proof". (Clinical Pharmacy Services Manager)

These pharmacists were certain of their contribution to care and suggested new services.

"M (Clinical Pharmacy Manager) and B (District Pharmacist) are going to see the value for money (VFM) officer to talk about the pharmacy interventions and litigation and the probable cost savings. The VFM officer is saying about the amount of money saved, like one big error

per year, pays for it (the pharmacy service). *Pharmacists tend to undervalue themselves.*" (Specialist Pharmacist)

This study found that some pharmacy staff believed that they were insufficiently equipped to provide certain services, particularly those that required them to participate with other professionals in care teams. In addition, pharmacy managers at some sites were faulted for failing to provide leadership and vision, and to manage change effectively. These issues were also alluded to in the DoH-commissioned skill-mix report. That report emphasised the need for adequate training, especially on interpersonal skills[446].

8.2.2.3. Unwillingness to accept uncertainty.

A potential role for pharmacists in prescribing was raised by some interviewees. Many pharmacists, however, were unenthusiastic about taking responsibility in areas of uncertainty and did not want to assume this role. They were more content working within a controlled framework, such as that provided by prescribing policies.

"The new clinical director would like me to do the prescribing but I can't do it because I don't know all the facts and they're not in the notes so I don't have the information to prescribe. If we had protocols I'd do it, but not if we haven't good doctors notes and protocols." (Specialist Pharmacist)
"I'm not in favour of pharmacists prescribing. There's too much conflict. It's the responsibility thing - who takes it at the end of the line. And what happens if the doctor wanted to prescribe something and didn't want to prescribe the thing that you had prescribed". (Specialist Clinical Pharmacist)

Some doctors felt that the reluctance to prescribe may be due to a lack of ability to handle indeterminate knowledge in pharmacy or a reluctance to assume full responsibility for complex issues.

"It's this restrictiveness that all paramedical groups have. They want to do new things but want a defined role. It seems a very negative attitude. They want it in a protocol" (Senior House Officer)
"I guess in a lot of hospital pharmacies they do not want to take on more responsibility and are quite happy just dispensing drugs". (Senior Registrar)

This may explain pharmacists' enthusiasm for prescribing TPN or cytotoxic therapy and their reluctance to prescribe in other areas. It may explain also why, sometimes, pharmacists seemed unhappy to make records of their contribution in the medical notes.

A minority of pharmacists were happy to prescribe. These were usually specialist pharmacists who had a higher qualification in clinical pharmacy and were working at sites where the pharmacy service was well-managed and led. There was evidence also that these pharmacists

felt that their contribution would be welcomed.

"I will prescribe and the doctors will sign anything. We've got full control of that. " (Specialist Pharmacist)

"It's come to the point now where they are prepared to let me try prescribing in the chemotherapy suite. I think they will be prepared to do it and it's no big issue to me. " (Specialist Oncology Pharmacist)

8.2.2.4.   Unwillingness to move to true multidisciplinary working.

Generally, pharmacists felt that they needed to be more team orientated to increase their contribution to care. Surprisingly, at most sites there was little orientation towards team work and pharmacists were not increasing their participation in multidisciplinary teams. Some of the problem was due to issues that have been discussed already, such as the adaptation of services to need and the management of change, but some was due to attitudinal issues. Although the directorate structure was encouraging teamwork, inhibitory attitudes in pharmacy retarded service development. Pharmacists often remained pharmacy-based rather than ward-based. All interviewees commented that the absence from patient care areas reduced pharmacists' interaction with patients and professionals, participation in patient orientated service developments, integration into the team and understanding of patient and professionals' needs in the practical situation.

"I wouldn't say they understand the scene on the ward with patient care. They always seem so busy, just dipping in and whizzing off to make it up or do other things. They don't really understand all of what's going on". (Nurse Manager ITU)

"The ITU-based pharmacist is in closer liaison with the doctors because she's there, on the ward round. In the renal unit the pharmacist comes on the ward round an odd time but not usually. I don't know why. The pharmacist could have a lot of input but we don't see her. There's so much to make use of. I think that if the pharmacist got remotely close to the renal unit, like the renal unit dietician, they would be more useful". (Registrar)

Pharmacist often related the problem to their absence from the ward rounds.

"I feel that ward rounds make us feel more important, feel like members of the team". (Resident Pharmacist)

"You are in touch with the decision-making process, not just reading about the outcome at the end of it" (Ward Pharmacist)

"It's quite important to be on the ward round. It saves you so much time. You get to the doctors and you know more about the patients. You become a familiar face and you get all sorts of things asked of you. " (Ward Pharmacist)

"If I got more time on the ward I'd definitely go on the ward round. It makes a huge difference. I'd speak to the doctors more. I tend to rush a lot now. If I managed to identify the problem, I'd speak about that and resolve the problem". (Ward Pharmacist)

Where directorate and specialist pharmacists were spending more time on the wards they felt that other professions accepted their role more, welcomed them as team members and utilised

their expertise to a greater extent. It also reduced interprofessional tensions.

"I'm flexible with my time not like someone with pharmacy commitments. I can go to meetings, ward rounds...in one week I see all the patients. It's set up so I can be where the decisions are made. The ward rounds go on so long you have coffee with them. It's one of the luxuries of being a full time clinical pharmacist. It facilitates suggestions being adopted. Continuity has a lot to do with it. I find I don't mind sticking my neck out" (Specialist Pharmacist).

These ideas are supported by evidence from a study by Howe[18]. She concluded that the directorate system had challenged pharmacy to develop new relationships with other health care groups. Pharmacists working with directorates could promote pharmacy services and adopt a team-orientated approach to service provision and patient care.

8.2.2.5.   Physical structure of the pharmacy

The physical structure of the pharmacy was similar in most sites; that is, there were barriers to the entry of other health professionals and the public areas, where they existed, were uninviting for patients. This was considered by pharmacists and nurses to inhibit the provision of services such as patient counselling.

"We haven't even got a counselling room You've got to yell at them (patients) so it's not made easy" (Ward Pharmacist)
"Unfortunately we don't have a nice patient counselling area. We'd love to do it in a nice little room. " (Specialist Pharmacist)
"It can't be good to tell people about their medicines through a hatch. If there were more patient information leaflets, people could read them as they waited sitting in the waiting area. It would educate patients and fill a need" (Ward Sister)

The physical barriers around the pharmacy, such as locked doors, discouraged other professionals from interacting with pharmacists and inhibited the promotion of a greater understanding of the services on offer. No pharmacist noted this issue but several doctors did. They said that the face that pharmacy presented to the world was the dispensary. It masked the complexity and extent of the services on offer.

"A lot of doctors don't fully appreciate what the pharmacist knows and can do and they don't fully utilise them. I think it's because they go to pharmacy and look in and see them counting pills and putting them in bottles. That's what you see them doing and you don't get the full impact of what they do". (Clinical Director)

They, and nurses, commented on the exclusion of other health professionals.

"You need eye contact in the pharmacy reception area. Someone to acknowledge that you are there. It can make quite a difference. It helps with the outside contact with the world" (Ward Sister)
"Pharmacy has set up physical barriers around itself. Junior doctors don't go to pharmacy because of the entry system. There's a huge library there with its potential unused. " (Clinical

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Pharmacologist)

"We can't access pharmacy now. It's all locked in. It's a big barrier. You've got to get an id (identity card) to get in. It's a problem, security, but it's a most off-putting approach. I don't bother going in there now. If they're going to shut themselves off and insulate themselves it's not the best approach. It gives the impression to the rest of the hospital that they don't want to get involved. It won't maximise free interchange of views and ideas and collaboration" (Clinical Pharmacologist).

The physical barriers may also represent a tangible demonstration of pharmacists' lack of patient orientation.

8.2.2.6. Lack of patient orientation.

The behaviour of most pharmacists, and the comments of some, indicated that their principle customers were perceived to be doctors. Many felt they had worked hard to gain doctor's approval of their service and had now achieved this.

"I'm there to advise when they're thinking of prescribing. I'm there for the doctors, to answer the question "Is there going to be a problem with these drugs?". Looking out for problems in advance, anticipating, to be there when they are talking about prescribing, answering "Is this available?" "Is this a good idea?" "Which are the best (drugs) in the elderly?". To suggest better therapies". (Directorate Pharmacist)

Most pharmacists focused on providing services rather than patient care and spoke about their role in terms of service provision. A few felt that the service would have to become more patient orientated to adopt truly the concept of pharmaceutical care.

"The amount of time that we spend at the bedside compared with other health care practitioners is very small. It's more the drug chart, the doctors and the nurses we concentrate on. " (Clinical Pharmacist)

"I do think we've handled things about moving patients in and out of hospital badly. What happens at the end is we think they are boring and we want a brand new interesting patient, like the doctors, yet that's the most important time for the patient. " (Chief Pharmacist)

Pharmacists recognised that an attitudinal change would be difficult to achieve. Even where pharmacists recognised that there was a need to change, this was not happening.

"We should have been here for the patient from the beginning. Pharmacists have worked terribly hard for 15 years at pleasing doctors. Why? I don't know. I've only been thinking about it for the past few months. Pharmacy still has to dig itself out of the pit and stand up out of the shadow of medicine. When I expressed the opinion that we really didn't think that the patient's feelings about his therapy was important because that not what we do in practice - we don't ask patients about their feelings or do anything that looks at this in practice - I got filthy looks from my fellow pharmacists. I suppose it upsets their beliefs. " (Chief Pharmacist)

"Maybe it stems back to patient care. Maybe if we'd sat and talked to patients we'd stay. How often do we go home and worry about a patient?" (Clinical Pharmacist)

"We are more involved with patients but not as much as we should be. " (Clinical Pharmacy Manager)

"At last, people (pharmacy) are becoming more patient orientated. With DUR, we're starting

to ask patients what they like, like with the cimetidine/ranitidine thing where we've asked patients about the smell of cimetidine" (Clinical Pharmacy Manager)

There was also a general feeling amongst non-pharmacists that pharmacists do not feel a duty to care for patients and hence do not develop services important for patient care, such as self-medication and counselling.

"I wouldn't say she spends a lot of time with patients because she comes up when the patient's are getting washed and it's a busy time on the ward. I'm not too sure she talks very much to patient's." (Staff Nurse).

"I think more of the patient, simple things that could be done to relieve pain, whereas B (Specialist Pharmacist) *is less patient orientated. I'm not sure she always cares about the patients. She thinks she knows best about their need for PCA* (patient controlled analgesia). *She will not bother getting the pump to the patient if they haven't been counselled by her as per protocol since she claims that they won't understand. Sometimes I think the service would run better without her"* (Pain Team Nurse).

These results are consistent with those of an interview study of chief and directorate pharmacists' and clinical directors' opinions on pharmacy services to directorates that pharmacy should become more patient orientated[455].

8.3.   Summary.

The strengths and weaknesses of hospital pharmacy have been detailed in the above sections. Pharmacy's strengths derived from its power base and the ability of pharmacy managers. The power was based partly on the authority that pharmacy has to provide services and the power of individual members of pharmacy staff. Greater power originated from pharmacy's knowledge base and its ability to reduce uncertainty. Additional strengths were pharmacists' proficiency in budgetary management and in the use of technology and skill-mix to provide services efficiently. Weaknesses included pharmacy managers' failure to assess and meet organisational needs, to initiate and manage change and to lead their departments, and their lack of an overall vision for the service. Other weaknesses were pharmacists' lack of belief in their effectiveness and the effectiveness of pharmacy services, their unwillingness to accept uncertainty and to move to true multidisciplinary working, and their lack of patient orientation. The physical structure of pharmacy departments also interfered with the appropriate provision of some services.

Some of these strengths and weaknesses were identified also in other recent studies on hospital

pharmacy[18 446.455]. In particular, pharmacy's knowledge base and its ability to manage budgets and use skill mix were identified as strengths. The failure to assess needs and to change services in line with those needs were identified as weaknesses.

The opportunities and threats to the development of pharmacy that exist in the environment are described in the next chapter. That chapter will make some comparisons between the results in Chapters VIII and IX and American literature on barriers to the adoption of pharmaceutical care in the United States. It will conclude with a description of the implications of the results of the SWOT analysis for the profession.

CHAPTER IX

OPPORTUNITIES AND THREATS TO THE FUTURE DEVELOPMENT OF HOSPITAL CLINICAL PHARMACY IN THE UNITED KINGDOM NATIONAL HEALTH SERVICE

9.1. Introduction.

This chapter continues the SWOT (strengths, weaknesses, opportunities and threats) analysis that was started in Chapter VIII. Here, the opportunities and threats to the development of hospital pharmacy services will be considered. This will complement the information on the strengths and weaknesses of the pharmacy service that was presented in Chapter VIII. As in Chapter VIII, the results will be compared with relevant results from recent key studies on pharmacy skill mix[446] and organisational management[18]. In addition, the results will be compared to evidence from the United States on barriers to the development of pharmaceutical care[462,463]. This chapter will conclude by describing the implications of the results of the SWOT analysis for future developments in hospital pharmacy. Suggestions will be proposed for improving current practice in pharmacy departments and actions that the profession, generally, may consider to optimise its contribution to the provision of care.

9.2. Opportunities and Threats - Continuation of a SWOT Analysis of Hospital Pharmacy.

9.2.1. Opportunities for Pharmacy.

Several opportunities existed. General managers felt that pharmacists had a large role in cost control. Clinical directorates wanted to use pharmacists' experience of budget management to help them control recently acquired drug budgets. Directorates were, increasingly, in a position to purchase services. Patient empowerment was providing opportunities for patient education on drug use and medicine taking. The increasing complexity of therapy was encouraging manufacturing services for total parenteral nutrition (TPN) and intravenous additives (IVAs). Pharmacists' advice on therapy for individual patients, and on drug policy in general, was also required due to rapid changes in drug therapy. Doctors and nurses were increasingly moving to multidisciplinary working and were inviting pharmacists to participate in the provision of care in these teams. The shift in the emphasis on the provision of care to the primary sector was providing opportunities for hospital pharmacists to expand their role in that sector and at the interface. Each of these factors will be addressed in the sections below.

9.2.1.1.   Role in cost control.

Most non-pharmacists, particularly those responsible for drug budgets, realised that pharmacy had an ability to manage budgets. This gave pharmacy an opportunity to develop information and cost control services for managers and directorates.

Non-pharmacists welcomed the provision of financial information and help in controlling the drug budget.

"I'm generally aware of costs and I think they should be kept to an absolute minimum. If you can provide the same treatment for less cost than I think you should" (Consultant)

"Drug efficacy and opportunity cost are also to do with quality. We have to control our drug costs if we are not denying the opportunity of therapy for someone else. It's the whole issue of the price of non-conformism with the formulary". (General Manager)

Managers felt that pharmacy combined a professional understanding of drug therapy and medical practice with objective knowledge of the drug and its cost that would assist them in controlling doctors' prescribing excesses.

"If I need to have a dialogue with clinicians about a drug, I wouldn't do it without C's (Chief Pharmacist's) *help. She knows about the product, its cost and has done the research on the product's efficacy. They should have as much knowledge as the clinician. Their views are likely to be more objective and they can tell about the comparative effectiveness of products".* (General Manager)

"The area where pharmacy contribute most is their contribution to cost control. It's an important area. It's an area where C (Chief Pharmacist) *has contact with management to tell us about trends, blips, new drugs, individual patients causing problems with the drug budget. .. They influence clinicians, manage is perhaps overstating it"* (General Manager)

Other services, such as IVAs, were viewed as helping in cost control.

"The CIVA (central intravenous additive) *service has worked very well. It seems ridiculous to use all a vial when you don't use most of it and you end up wasting it. It's saved nursing time .. and reduced costs and increased quality by having the right dilutions."* (Clinical Director)

Many pharmacies realised that these opportunities existed; a few were exploiting them.

"The information and the statistics are going to develop more and more in the future like we are going to have to cost the drugs for a total hip replacement and things like that. The more information we can produce the better for us. Obviously finance is going to be very important in the future, They can see what they're spending money on in our reports." (Pharmacy Secretary)

Managers thought that pharmacists were experts on drugs who could provide them with unbiased information and advice. Many felt, however, that their skills might be under-utilised at present due to barriers such as lack of involvement with patients and pharmacists' attitudes. Lack of resources was also recognised as a barrier but this is addressed separately.

Khanderia obtained pharmacists' and clinical directors' views on pharmacy services to directorates in 1993[455]. Several of the ten clinical directors that she interviewed suggested a role for pharmacists in helping control drug budgets. Their proposals included monitoring of drug expenditure, promoting rational cost effective prescribing, implementing the formulary and good purchasing. Some wanted cost control services, such as the management of drug budgets and the provision of financial information, increased. Many of the ten chief

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pharmacists interviewed proposed similar strategies. All directorate pharmacists interviewed at hospitals where the clinical director held drug budgets felt that they had a role in helping manage the budget.

The devolution of budgets to directorates was thought also to have created several opportunities by interviewees in the present project.

9.2.1.2. Devolution of budgets to directorates.

Budgets had been devolved to directorates at several sites and this process was underway at the remainder. Clinical directors' (CDs) and clinical services managers' (CSMs) minds were focused on methods of controlling the drug budget. They envisaged pharmacists providing information on drug expenditure and on the effects of therapeutic advances on their budgets, advice on ways of saving money and help in influencing prescribers.

"C (Drug Information Pharmacist) produces factual information on a monthly basis on drug expenditure for the consultants with explanations of why people overspend. I use pharmacy quite a lot and I get the response from them. I got them to do a talk at the medical meeting on drug use and prescribing and to make recommendations at consultant level". (Business Manager)

At one site, the directorates agreed to purchase pharmacists' services. Most managers there felt that pharmacy services were necessary, even essential, and value for money.

"I think it's probably quite expensive, the pharmacy service. I don't know if I'd change anything in particular though. We do a cost benefit analysis all the time to look at our services to see if they are value for money. " (Clinical Services Manager).

"It (ward round service) *was withdrawn two to three years ago but we decided to fund it ourselves from the unit budget. The savings M* (pharmacist) *generates, the advantages of using alternative cheaper drugs, the cost effectiveness equation. He constantly reminds us and he saves more money than he costs. Off the top of my head I have no criticisms. "* (Clinical Director)

"We'd identified the difficult parts of the budget to control. Drugs were up at the top after we'd sorted out the staff. One of the ways it became apparent we could do something about it was with a pharmacist on the ward. It was seen as a priority. The other things we could control here more cheaply. Drugs, no. Because historically we were going against the clinicians, we needed a credible person to control the budget on drugs and to go against the doctors. The doctors also wanted it. They thought it was good. There was also the expectation from senior management that the CSM should put in place a control mechanism for difficult areas of management. We got brownie points for the clinical pharmacy service. " (Clinical Services Manager)

The failure, by some directorates, to purchase services was though to be due to their attitudes and priorities, the low relative expenditure on drugs in the directorate and the relative ease with which they controlled the drug budget.

Clinical directors and managers saw opportunities for pharmacy to develop services that improved quality, efficiency, the marketing edge of the hospital and re-admission rates.

"In terms of the reasons why we purchased clinical pharmacy services. There were three reasons, patient safety, cost containment and education of ITU (Intensive Care Unit) *staff."* (Clinical Services Manager)

"They give us very good advice about the budget. They advise about the drugs, specifically about certain aspects of interventions like TPN (total parenteral nutrition) *versus enteral nutrition. They've spent some time working out the best way to do it and have saved the hospital an enormous amount of money as a result. In addition to management and management decisions they carry out cost benefit analysis very broadly in prescribing and development of protocols and they're very important in management."* (Clinical Director)

Managers were also interested in getting pharmacy to take on roles formerly performed by junior doctors. Directorates sometimes funded services, such as the CIVAs (central intravenous additive) service, at sites where contracting was occurring on a smaller scale.

"Every year D (Chief Pharmacist) *says 'I won't pay for it* (directorate funded services such as the CIVAs service)' *and the clinical directors say 'no, we won't either' but both parties recognise that the service is very valuable and it gets paid for eventually. They all know it's in everybody's interest to strike a deal".* (Clinical Pharmacy Manager)

At other sites, there was also a willingness to pay for pharmacy services.

"Her cost is about ten percent of the drug budget. We will include her cost in the charge we make for treating patients at the hospital if it comes to that. I think paying £20,000 for a pharmacist is worthwhile. Our drug budget is over £200K pa." (Consultant)

Pharmacists felt that the devolution of budgets to directorates provided opportunities to expand pharmacy services and to use pharmacists' skills more appropriately. Directorates had the resources to buy pharmacy services. This could stimulate their expansion.

"We are going to have contracts for an integrated service. It will stop creeping developments. It will give a baseline across the hospital and identify the service that different wards are getting. Based on what's happening now they can see a ward pharmacy service and can request it". (Unit Pharmacy Manager)

At the site with contracted pharmacy services, pharmacy had been able to preserve and develop services.

"I think what helped us was the need for the directorates to manage their own budgets. The staff and the drugs' budget had gone to the clinical directors. They had a need to keep it under control. Not all, but most CSMs were fairly receptive to the idea of a service to monitor the prescribing and look after the safety aspects, they are now more so than then, and were willing to pay for someone to do that." (Pharmacy Services Manager)

"There was a perception among the CSMs or the clinical directors of their needs, especially the CSMs in the budgetary area. The clinical director and the CSM had pressure of their own budget and they hadn't the information to manage it. There was pressure from the director of finance." (District Pharmaceutical Officer)

At this site, pharmacy managers were now attempting to allocate the costs of the remaining

centrally funded services to the directorates.

"I'm now working on a way to fund (services) via an indirect cost to the clinical directorate service. The indirect costs include things like DI (drug information), management, training, education and training and clerical and secretarial support. These are in the contracts already so the price they pay reflects the direct and indirect costs of the service. They know they're buying this at the moment. I might be able to use this to increase the funds for education and training." (Chief Pharmacist)

The pharmacy manager was optimistic about the future.

"I'm very optimistic. It's a great time to be in hospital pharmacy. I see it as a wonderful opportunity. I think that it's the best news of all for pharmacy, all these changes. Pharmacy was a stagnant profession before. Now it's changing every day. I'm glad it's happened. We'd never have been able to do the things we've done without the changes. It's a chance for pharmacy to develop it's full potential. They need us very much, more than ever before in many more ways." (Chief Pharmacist)

Where there was less experience of directorates purchasing services, there was less optimism.

"We've produced a very good document describing what's available in pharmacy. If they want extra they'll (directorates) have to pay for it. I'll tell them what they're getting and how much it costs now" (Clinical Pharmacy Manager).

"With contracts, there's a description of the service. It's meant we're budgeting for overheads and now putting them into contracts" (Community Services Pharmacist).

Where there was no experience of selling services to directorates, there was a more

pessimistic view about the opportunities presented by the directorates.

"In the future when the chips are down clinical directors may have to choose between a clinical pharmacist and a junior doctor, clinical pharmacy may lose out. A lot of clinical pharmacy is of dubious quality and is not good value for money so it will get rejected." (District Pharmaceutical Officer)

The devolution of budgets has forced pharmacy to consider the reasons for providing its services, and their efficiency and effectiveness. This was seen, by some pharmacists, as an opportunity for pharmacy to streamline its services and to respond positively to change.

"The basic service has got to be efficient. Pharmacists are very expensive compared with physios (physiotherapists) and dieticians and everyone else. If that's so then you have to give value and a basic dispensing service at high cost is not good value for most people. There are technicians in charge of the dispensaries, purchasing and the basic co-ordination of DI with senior pharmacists in charge. I'm not saying you can do it universally (use technicians) but you've got to give value. You've got to know that there's a general feeling throughout the hospital that you do (give value for money) and you've got to constantly review areas from the technical side." (Chief Pharmacist)

"We need to change where people have established patterns in their head of the way things should be done. Being proactive protects you against change". (Chief Pharmacist)

The finding in this study are in broad agreement with those of Khanderia[455]. In her study,

clinical directors and pharmacists saw some opportunities in the devolution of drug budgets to

clinical directorates but there were more negative views about the devolution of staff budgets. She found that most chief pharmacists and clinical directors opposed the employment of pharmacists by directorates since this was felt to increase fragmentation and reduce peer support, training, credibility, accountability, flexibility and efficiency. In her study, directorate pharmacists were less negative and thought that their employment by directorates might increase their integration in the team. The reasons for the differences between her findings and those of this study are unclear. It is possible that differences in the research methods may have been important. Khanderia asked for opinions specifically on the employment of pharmacists by the directorates; she did not inquire about alternatives, such as a directorate paying pharmacy for the services of an individual pharmacist but not directly employing them. In addition, her survey was carried out two years before the present one and the directorates may not, then, have held a budget enabling them to purchase pharmacist's time. At the time that the present interview survey was carried out, some directorates held budgets permitting them to purchase the services of pharmacists. The implications of clinical directorates and the devolution of budgets to directorates were explored also by Howe[18] just prior to the start of the interview phase of the present survey. Her conclusions were similar to those of this present survey. She found that directorates provided opportunities for pharmacy, similar to those described here, although her study focused more on managerial and organisational issues deriving from the change to a directorate structure.

The devolution of budgets was providing an opportunity for pharmacy to provide advisory services but advice was required also because drug therapy has increased in complexity.

9.2.1.3. Increasing complexity of therapy.

There was widespread recognition that drug therapy had increased in complexity. Doctors and nurses were unable to keep up to date without the help of pharmacy. They felt that several pharmacy services were necessary for the proper use of medicines.

"They sort out the drug issues fully. That's where I see pharmacists contributing, as a continuing information service. With drugs changing the (integrated care) *pathways need to change too"*. (Specialist Nurse)
"There's so much legislation with medicines, so many preparations that it's really impossible for all grades of staff to familiarise themselves with them and to keep themselves updated" (Nurse Manager)
"With TPN we just give them (pharmacist) *the IV results and they do it. It's very useful they tell you what to prescribe. I'm ignorant of that type of stuff"*. (House Officer)
"I think DI is very important and there's a great need for information. It's one of the most difficult things to obtain and you can't get unbiased assessments of anything now" (Clinical Pharmacologist).

"What I've noticed in the last few years is medical staff are relying more and more on pharmacists' advice. When I came here if a member of junior staff wanted to know something they looked it up themselves. They're relying more and more on pharmacy input like asking for therapeutic advice for patients. " (Consultant)

"More active teaching like a drugs update every three months for the juniors as well as the consultants would be good". (Clinical Director)

The manner in which drugs were administered had increased in complexity. Pharmacy were viewed as being better providers of products such as TPN, complex chemotherapy and other intravenous drug therapy. Most interviewees, particularly doctors, felt that pharmacy should supply pre-prepared IV medicines, such as patient controlled analgesia (PCA) medications, TPN and IVAs, because this would enhance convenience, safety, quality, efficiency and cost.

"They provide us with a very good service. Anything that goes into a patient through a vein, even potassium, is from pharmacy. Virtually nothing isn't. It is good. Mistakes in prescribing are avoided and asepsis is adhered to". *(Consultant)*

"TPN is an important part of her (pharmacist's) *work. She works out how to fit the maximum number of calories for the minimum fluid volume. It was previously done by the SHO* (Senior House Officer) *on the ward but it's now done by the pharmacy. It's a major load off our shoulders. The fact that it's done in pharmacy reduces the risk of error and infection. "* (Consultant)

Pharmacists knew that therapy had become more complicated but they were probably not as aware of the importance of their role in its preparation. A similar comment could be made regarding perceived pharmacists' roles in primary care.

9.2.1.4.   Increased emphasis on the provision of care in the primary care sector.

Several non-pharmacists mentioned the opportunity for service development due to the shift in health care provision and funding to the primary sector, yet pharmacists often placed little importance on this facet of their role.

Non-pharmacists felt that the NHS changes have provided greater resources in primary care which might facilitate pharmacy service development in that sector.

"One of the services that pharmacy could think of is to look more in community. Why not offer services to GP (General Practitioner) *fundholders. GPs might use drug information, in-depth appraisals, guidelines they'd find difficult to do themselves. Community pharmacists can't do it. Pharmacy here could sell their service to the community and they are able to pay for it".* (Consultant)

Hospital managers, with some responsibility for primary care budgets, wanted pharmacists to become more involved in that sector because they were concerned about escalating costs.

"Primary health care is using a greater share of the budget but we've no control over it at the

moment. We've no control over the increasing demands as fundholding GPs increase. The GPs can basically order what they want. We've got to work with the purchasers to control them".
(General Manager)

Pharmacy sometimes responded to the opportunities in primary care. One pharmacy had won a contract for the provision of services to primary care and a minority of pharmacy managers had spotted the opportunities in primary care.

"A couple of years ago we got money for a FHSA (Family Health Service Authority) *service. That is only in part to do with answering inquiries from community, GPs and practice nurses. ... it's to support the indicative prescribing initiatives."* (Drug Information Pharmacist)
"Pharmacists have got to be politically astute, to learn to adapt to spot where priorities lie like the move to primary care at the moment, to follow through patients to the community. It's very important because patients are being treated at home. M (Chief Pharmacist) *is very involved in a scheme to keep children there, out of hospital. We're faced with the quality issue of patients at home receiving drugs. They need support. There's no reason why we, or community pharmacists, won't get money from purchasers to fill the gap".* (District Pharmaceutical Officer)

When prompted, most pharmacy managers admitted knowing of the need to provide pharmacy services to primary care, or at least at the interface. The majority, however, were doing little about it.

"My impression is that the FHSAs and the hospitals are not working as closely together as they should. There's a bit of window dressing going on still. I'd like to work closer with FHSAs but it's almost like we have to wait for them to establish their own agenda and see if we can do things together. ... FHSA and hospital pharmacists need to work more closely together" (Chief Pharmacist).

9.2.1.5.   Patient empowerment.

Patient empowerment was thought to have provided an opportunity for pharmacists to expand services, especially those that educated patients and helped them take medicines correctly.

Some pharmacists felt that changes in society had helped create this opportunity.

"Opportunities arise naturally from social change. It's now alright (for the patient) *to have an opinion about his therapy and to have more information about it. "* (Chief Pharmacist)

These pharmacists were in the minority and most pharmacists did not seem to realise that this important opportunity existed. Even those that did were often limited by perceptions that funding could not be obtained for the service.

"We're not exceptional (bad) *with respect to patient counselling. It's difficult to identify a payback for that service. You can argue that it may prevent re-admissions. We can measure the savings on IVs, nursing time in ITU etc for the CIVAs. It's an easier service to sell".* (Clinical Pharmacy Manager)

Non-pharmacists had a greater awareness of the need for educational services for patients and

saw opportunities for pharmacy to help them provide appropriate services.

"The next major area of opportunity is discharge planning and quality, how to get across the idea that patients don't go from being incompetent one minute to competent the next on dealing with their medicines. That encompasses the whole area of counselling and patients knowing how to use medicines" (Business Manager)

There was extensive recognition amongst nursing staff that pharmacists were needed to

provide counselling and self-medication schemes.

"I'd like them (pharmacists) to have a greater input in patient care and understanding of drugs. We're looking at self-medication here. ... We cannot do it without the pharmacy's input. I think that the pharmacists should be available to talk to patients. Nurses and doctors are both poor at that. Nurses don't have the knowledge. If the patient asks questions the nurses don't, and can't be expected to have, the knowledge to answer them." (Nurse Manager)
"Patient education. That's probably one of the things we could do more of. She (pharmacist) doesn't have much time to talk to patients about TTOs (to take out). Nurses are still involved and talking to the patient about them. Some nurses are probably unhappy to do this. It is an area where the nurses feel they're very lacking in knowledge. They'd feel happier if A (Pharmacist) did it rather than them. For any specific patient with real problems she does it anyway." (Nurse)
"They should make the .. information that they provide easy to understand and relevant. As a ward sister, I'd hate to think of anyone going out of hospital and not understanding their medicines". (Ward Sister)

It was also seen, by some nurses, as addressing patients rights.

"I'd like patients to self-medicate. That's something that was proposed to the pharmacy department but they thought that it would be too expensive. I feel it's something we have to look at in the future. To a degree patients are treated like babies here. When we see it from the patient's point of view we're annoyed. That's where we have to move forward to self-administration for patients. Patients do need to be involved with their care. It addresses patient's charter rights and patient autonomy." (Nurse)

Medical staff saw the need for pharmacy involvement in this important area of care and

thought that it could help improve patient outcomes.

"An area I think should be looked at more by pharmacy is discharge medication. I have the feeling that it's not looked after properly. It's one of my hobby horses. I've asked the pharmacist to do a little study on it. The self-medication scheme is part of it. I feel that patients are sent home on too many or on unnecessary drugs. There's a big area that needs attention. That's discharge. Patients are given a bag of bottles and waved goodbye. Even the young intelligent ones get mixed up with their drugs after a few weeks never mind the older ones or those who are can't read the labels. It's one area where pharmacists could get involved very much." (Consultant)
"Their other role is patient education. Hopefully they have more time or they take it in a different direction to us (doctors) to spend time with patients to educate them to improve compliance." (Senior Registrar)
"It's valuable to find a pharmacist who is able to discuss drugs with the patients on the wards especially the elderly and these on poly pharmacy. Patients don't really understand their drugs and why they are taking them. If we could get them to take a little responsibility for the drugs they have at discharge .. it would help to improve compliance so it's very valuable. With the speed at which patients are turned about now you try to maintain a certain minimum acceptable standard. ... It's in this situation that we rely more on pharmacy to pick up the bits

(like counselling). " (Consultant)

They felt that the difficulties pharmacy envisaged in selling the counselling service were surmountable since directorates would be more concerned with the overall care provided by the team, rather than considering the pharmacy service in isolation.

"In a way we shouldn't be measuring individual performance. We should talk about team performance. Pharmacy is part of the team. I don't think you can cost the educational benefit to the doctors, nurses and patients." (Consultant)

Khanderia[455] found also that clinical directors and pharmacists felt that self-administration schemes and patient education were relatively neglected in hospitals. She found that directorate pharmacists felt that pharmacists should be more involved in these areas but five of the ten clinical directors interviewed had no confidence in pharmacists' abilities to counsel patients. These five felt that pharmacists did not understand patients' concerns, the pharmacist's advice might be contradictory to the doctor's and the information might alarm the patients.

9.2.1.6.   Multidisciplinary team working.

The majority of hospitals were moving to the provision of care by multidisciplinary teams. They saw this as a better way of providing care since it employed all the available skills to optimise patient care. It was thought that pharmacists' participation in the health care team offered several advantages, such as ensuring the safe use of medicines, the education of patients and staff in the use of medicines, and the provision of information to keep the team up to date on drug therapy.

"Pharmacists contribute to patient care in education and health promotion and in the way they contribute to safety massively in the organisation. They check prescription cards and challenge inadequacies and recommend changes if necessary. They participate in the multidisciplinary team and contribute to patient care and they educate nurses and patients and allow improved care." (Nurse Manager).

Nurses and doctors often requested services. Had they not, it is doubtful if some services would ever have been provided. There seemed to be little real resistance to pharmacists' expanding their role provided that it was within a team framework.

"We are in the process of introducing specialist teams like wound care teams. The pharmacist is part of that team. We do intend to set up more teams like pain control teams and nutrition teams. We see pharmacy taking an active part in these teams. The teams are primarily coming from nursing but we are inviting the pharmacist onto them. If you are talking about wound care, to me the pharmacist is essential to have as part of it. We invited them on". (Nurse Manager)

The medical profession has also become more team orientated. Their support for service development was thought to be important in helping pharmacists integrate into teams.

"She (pharmacist) *is a team member for the ward round. Interactive pharmacy is a fantastic advantage for ward rounds and audit. They make a significant contribution to patient management and to audit in the unit".* (Senior Registrar)

"Unless you have a motivated clinician you don't get the service. If they say "I want a better service" it gets others involved for example with the pain service and the diabetic service. Sure, pharmacy can influence it but I don't think it can happen as well without the co-operation of the lead clinician. I don't see any pharmacist initiating anything here". (Senior Registrar)

Managers often pointed out that pharmacy has not realised that the medical profession has become more team orientated. Since pharmacy is a service department it is important for them to take medical power into account in service development but not to be deterred by it. Many commented that they often overestimated medical opposition and failed to develop services as a result.

"They were, and I think they still feel threatened by the medical mafia. ... A newer generation of consultants have come here. They don't have quite the same reactionary feelings as their older colleagues. They look more to their colleagues in other disciplines for help." (Unit General Manager)

"There's still a strong medicine mafia but there's more of a teamwork attitude now" (Business Manager)

Some pharmacists saw benefits in team membership and were pursing actively integration into the team.

"I can now make a much more positive contribution. Going on the ward rounds I'm seen as a member of the unit. If you're part of a team then they'll ask you questions" (Specialist Pharmacist).

They thought that the directorate system would facilitate their involvement with teams since it encourages provision of services as part of a team rather than as a member of the pharmacy department.

"The directorate system .. provides the ideal opportunity for us to get involved." (Ward Pharmacist)

Most pharmacists, however, still provided their services as part of the pharmacy department and not as part of multidisciplinary teams.

"There are only a few areas like oncology where the pharmacy is truly integrated into the team". (Clinical Pharmacy Manager)

The directorate system was even felt to be a problem by some pharmacists since it would move pharmacists nearer the teams and further from central pharmacy control.

"Only the drug budget has been devolved as yet, not the staff, not yet. When everything is devolved it will be more difficult. I'd prefer if it wasn't devolved, to keep central control. It will be more trouble when it does devolve." (Chief Pharmacist)

These results were generally in agreement with those of Khanderia who found that directorate

pharmacists were in favour of increased integration on to the multidisciplinary care team but their managers often were reluctant for this to occur[455].

9.2.1.7. Smaller hospitals.

A further factor was the size of the hospital. Smaller hospitals facilitated easier communication and this facilitated the maintenance of good interprofessional relations and the integration of pharmacists onto teams.

"It's a small hospital and I like it very much. You're able to get to know loads of people in here." (Specialist Pharmacist)

"It's a fairly small hospital with dedicated pharmacists (specialists) *so they're usually in touch with patients' cases and the needs of health professionals."* (Senior Registrar)

"I've never come across any problems with the pharmacy here, no conflicts really. It's a small hospital. Each department knows each other and there are close working relationships". (Senior House Officer)

9.2.2. Threats to Pharmacy.

Threats existed also. Some were due to organisational issues in hospitals, the possible devaluation of training and other facets of short-termism in trusts. The lack of awareness by others of the availability and potential for pharmacy service development and their contribution to care was a threat also. In addition, the potential for certain pharmacy services to challenge the roles of doctors and nurses and the potential threats to professions from managers threatened the development of pharmacy services.

9.2.2.1. Possible devaluation of training and other facets of short-termism in trusts.

Trusts have brought a business-like atmosphere to health care. This may pose risks for pharmacy if a solely short-term view is taken on pharmacy training and services.

Trusts must make services more efficient to increase their competitiveness in the marketplace. This creates downward pressure on resources for services such as pharmacy. At all sites, pharmacy managers were under constant pressure to reduce costs to enable the creation of cheaper contracts and, thereby, to attract purchasers. As a result, pharmacy managers were concerned with retaining staff and maintaining, rather than expanding, services.

"In the new NHS Trust environment it will be more difficult than it has been to develop services." (District Pharmaceutical Officer)

Most pharmacists, and several others, named a lack of resources as a main barrier to the

development of pharmacy services, including many of those requested by pharmacy's customers.

"There's a lot more they could do. Without playing the same song, it's resources are the problem". (Business Manager)

"We just cannot ask staff to do any more. If there's funding we would like to develop a (more) *clinical service but you know how hard that's to do and to justify."* (Chief Pharmacist)

"I think that they are unable to make the commitment to develop services. I'm sure they're pretty eager to contribute but .. they don't. One of the main reasons is resources, finance". (Nurse)

This was perceived as a loss to patient care by all interviewees. The effect of this barrier has been addressed separately, in Chapter VI, for each service to which it related.

Lack of resources was felt to be a universal NHS problem. However, where pharmacy had been well-funded historically, often partly by pharmacy profit-making schemes, there was a fear that this money would now be used to fund the hospital instead.

"The potential medical manager of pharmacy services (a clinical director) *sees pharmacy as the goose that lays the golden egg and wants to manage it. He wants to control it since we make a great deal of money".* (Chief Pharmacist)

Managers raised this possibility.

"His (Chief Pharmacist's) *income generation is so good he can fund his own developments. His profit-making reduces the baseline costs of pharmacy and has benefits for the hospital, like the pneumatic tube system."* (Hospital Manager)

Managers also suggested that services could be funded by directorates through purchasing contracts but this had been achieved successfully at only a single site. There, it brought pressure to bear on pharmacy to prove the cost-effectiveness of its services.

"As the pharmacy in the hospital they are giving their professionals advice. .. we asked one (a pharmacist) *in to save money. I'm waiting for the 6 months report to see if she's cost effective. I did threaten to send her back if she doesn't pay her way. I'm now waiting to see."* (Clinical Director)

The need for pharmacy to market services to directorates to ensure their survival and funding was emphasised by interviewees. The findings of two other pharmacy-based studies[18,455] support this.

CSMs at sites with no contracts for pharmacy services often adopted a tactical attitude to budgets. This might make it difficult for pharmacy to show its cost-effectiveness. One manager compared the directorate's attitude to their drug expenditure to a child's attitude to pocket money.

"It's like a kid at home on pocket money. For as long as I'm at home I'll try and convince Mom to give me more and more pocket money. It doesn't matter whether I need it or not or

how I spend it because next year, when I move away from home, she'll give me the same amount and then I'll live cheaply. " (Manager)

Although managers were beginning to question if pharmacy was cost-effective, in most sites pharmacy was not high on manager's lists of priorities. This was because its expenditure was not the largest figure on the list, it had been relatively trouble-free in the past and it was not a high profile area.

"Pharmacy has a low profile because it has not given us a pain in the gut. The negative side of it is 'Is it very cost effective?' I'm not sure I know what cost effective will mean in pharmacy". (Unit General Manager)

Downward pressure on resources had stimulated the optimisation of skill mix and consideration of staff contracts at several sites. Tasks formerly performed by pharmacists had been delegated to technicians and some had delegated technician tasks to assistants. At sites where the latter was underway, there were concerns that technicians' numbers would be reduced.

"It is a jolly expensive service. There's no way I can decrease that. No way to get around it on the pharmacist side. Now I've got to look at the pharmacy skill mix and the next step is to look at the technicians and pharmacy assistants. That's where the next set of hard decisions will come both in patient services and technical services. " (District Pharmaceutical Officer)

Incremental drift (increasing salary costs with increasing duration of service) was also a problem at sites where staff remained in post for long periods.

"We've got to look at our costs since the purchasers will pass it to me to help with their cost improvement demands. The big problem is incremental drift due to the stable staff going up the incremental scale. I have to face that. " (District Pharmaceutical Officer)

Yet, at sites with a high staff turnover there had been difficulties in recruiting short term contract technical staff and this had severely hindered service provision.

Trust managers thought that narrow thinking in the NHS on roles prevented the efficient provision of services and utilisation of staff. They were keen to define pharmacists' expertise.

"The other big part is, What can pharmacy do? What is a pharmacist? I'd like them to spell out what they do. What makes you unique? How much of the job can be done by others? How much is unique to you?" (Unit General Manager)

This could be a positive step, since it could increase pharmacists' roles or encourage the delegation of tasks better suited to others, but a number of managers chose to emphasis the removal of functions from pharmacists to reduce staff budgets. This frightened some pharmacy managers since it threatened the maintenance of an integrated service.

"There's the threat from the new breed of administrator who doesn't know about the integrated role of the pharmacist". (Chief Pharmacist)

"It's important to show how interdependent pharmacy is so they can't pick up dispensing but not clinical pharmacy. One can't work without the other" (Pharmacy Manager).
"There are threats from general management who don't realise the worth of pharmacy. They have no concept of pharmacy's potential". (Chief Pharmacist)

At the extreme, trust managers could tender for pharmacy services but they were cautious about this move.

"We may be forced into some sort of competitive tendering. But we'd have to get a handle on the basics and then give people the opportunity to say what they are doing. I believe there will be a greater focus on these issues of cost effectiveness of services and defining what the service is. " (Unit General Manager)
"One of the problems is that in the hospital system we've got a monopoly service. What option do I have? Who am I to ask? The contract with the pharmacy may be put to tender in the future. I see that as an option. We've a good service and relationships. I wouldn't want to lose that. It's not just a question of costs. It's also trust. " (Clinical Director)

Smaller pharmacies felt particular vulnerable because of their relatively higher staffing costs.

"We're small and so at a disadvantage with regard to big hospitals. We've higher staffing overheads and don't have the volume to explain it. " (Specialist Pharmacist)

Their fears may be justified since one CSM commented that pharmacies in hospitals that are located near each other, geographically, could easily amalgamate. She was unimpressed by claims that different hospitals might need different specialist pharmacy services and that gaps in service provision might be created by such a move.

Short-termism, and increased managerial power, in trusts may have implications for staff training and professional status. Pharmacists openly expressed fears about this and about the demise of national co-operative services that were used as resources by all pharmacies, such as the drug information (DI) service.

"By having work sharing nationally we have co-operation on a reasonably equitable basis. It's not paid for by the hospitals but we all benefit. I'll be sad to see it go. If it does, it will be replaced by a commercial interest. My big fear for DI is not about the need for DI but how it's going to be organised; that is co-operation versus competition. If managers get involved and want it to be a money generating scheme then you may have problems especially if it's only some managers. " (Specialist Pharmacist)
"Trusts don't recognise that professional people need training and professional contact. Here, the training budget has been independent but it may not be in the future". (District Pharmaceutical Officer)

In addition, pharmacy would lose the status it gained under Noel Hall (when District Pharmaceutical Officers gained access to the chair of the health authority) and, therefore, their self-perceived high status in the NHS hospital service.

"The greatest challenge over the next two to three years is for pharmacy to try to ensure that it retains its post Noel Hall status in the establishment. Status is everything. If you have it, you can develop your service. You see, Noel Hall made the head of pharmacy directly accountable to the health authority. This gave him direct access to the chair of the health authority - that's

power. Once you've got it you have the recognition in the organisation". (District Pharmaceutical Officer)

9.2.2.2. Pharmacy challenge to the roles of doctors and nurses.

Nurses and pharmacists seemed to get along well at a professional level and nurses, more than other groups, spoke highly of their pharmacy colleagues. A minority of nurses mentioned being in awe of pharmacy but this was at a site with highly specialised pharmacists who were seen by many to behave a little like medical consultants. The relationships between pharmacists and doctors varied depending on the site, the interviewee's profession and their experience of services.

Nurses were aware of changing professional roles, skill mix and total quality management and had a more multidisciplinary attitude to the provision of care than others. Changes in nursing roles and responsibilities had presented some opportunities for pharmacy to develop services with, or in place of, nurses.

"Opportunities exist for us to take on the roles of the nurse that they're leaving behind like drug administration. ... Perhaps have a pharmacy technician doing the oral drug rounds. It's less costly than a nurse. " (Chief Pharmacist).

At a few sites, some nurses were reluctant to allow pharmacy to have a large involvement in the provision of services, such as patient counselling, self-medication (self-administration), or IVAs (intravenous additives). Most of these nurses had been in post a long time and may not have agreed with more current thinking on care. Such attitudes, and the presence of specialist nurses, had, however, inhibited pharmacists establishing services such as patient counselling at a few sites. In addition, pharmacists thought that nurse specialists would be competing with them in some areas.

"The roles of the specialist nurse initiating therapy, modifying doses, doing what specialist clinical services pharmacists can do are a major threat to us. Medical staff find it a lot less threatening to have a specialist nurse, who may not be capable but who can be taught, rather than have a more questioning costly pharmacist do it. I'm not totally sure we'll win the battle there" (Chief Pharmacist).

In contrast, nurses often criticised pharmacists for their reluctance to share professional knowledge. This was thought to prevent the optimum provision of care. Nevertheless, disputable roles existed that could cause interprofessional conflict.

The directorate structure improved relationships in general because it increased contact between professions and helped define the pharmacist's contribution to care in relation to that of others. This improved doctor-pharmacist relationships. Some doctors were keen for

pharmacy to expand its role into advisory and patient-orientated services. It was thought that this could increase their professional status just as recent changes in nursing had improved nursing's professional status.

Many, however, recognised the sensitivity of the relationship between medicine and pharmacy; in effect, pharmacists often have to criticise doctors' prescribing. Most felt that there was a greater need for pharmacists to be sensitive when dealing with older consultants who may be unused to the newer pharmacy services, may fear that gaps in their knowledge will be exposed by the clinical pharmacist, and may not know what, or how good clinical pharmacists are, or how to use them.

"The consultants also found it quite hard. They are all specialists and very good. To begin with they found it difficult to use me to my full potential." (Specialist Pharmacist)

"I think my generation of doctors, unless they are fairly broad-minded, think of pharmacy as being too clever, telling you what to prescribe. They see them as a threat on ward rounds, exposing their lack of knowledge. They might ask questions and show them up. It's the desire to hide ignorance. It's one factor." (Consultant)

Middle grade junior doctors can pose problems because they may be unwilling to admit that they might be wrong, or need help, and experienced pharmacists often threaten them.

"It's likely that junior doctors might feel threatened by pharmacists since they are less secure than more senior doctors" (Consultant)

"By and large the middle grades of doctor can be the ones who cause the most problems. They can be very big headed and they don't have enough self-confidence to say that they don't know." (Clinical Director)

"A lot of doctors that come in to ITU (Intensive Care Unit) *feel fairly threatened by him* (a very knowledgeable specialist pharmacist) *like junior SHOs and non-specialist ITU doctors. They are fairly intimidated by him. I'm sure he puts it as diplomatically as he can but doctors don't like being questioned."* (Registrar)

The problem was worsened by junior doctors' dislike of receiving criticism from someone other than their manager and by some pharmacist's non-discursive approach to issues.

"I'm not sure the pharmacists and junior doctors get on too well. Pharmacy tells them off and that's what they see." (Directorate Business Manager)

Most junior doctors preferred a pharmacist who had a helpful, rather than a scathingly critical, approach or one that was flexible in the application and interpretation of policy.

"It's better in every way now. People (pharmacists) *are interested, communicative and tactful. They have a broader base of information and they're much more collegial too. You can discuss problems with them and develop it so a solution is found. It's much better"* (Consultant).

"The drugs guide is quite regimented. Pharmacy often get it out of perspective. Pharmacists creating protocols and guidelines is all right so long as it's not too dogmatic." (Senior House Officer)

Junior doctors always recognised that they needed pharmacists to help them prescribe better.

Most welcomed policies because they reduced debate around prescribing and, thereby, reduced

interprofessional conflict. Minor conflict was more likely to be caused by an aggressive, confrontational, pharmacy approach rather than by a co-operative, advising, one. Specialist and junior pharmacists were noted, by doctors, to be more prone to adopting an aggressive manner with junior doctors. This caused much resentment because it was noted, also, that these pharmacists would not try such an approach with more senior doctors. Nagging the junior was acceptable but consultants felt that pharmacists should not make such large distinctions in the treatment of doctors based on seniority.

"The junior doctors say 'She's very nice to you but you should see the way she treats us'. They (pharmacists) tend to rank people in terms of the organisation. " (Consultant)

Pharmacists confirmed that they were more likely to challenge junior doctor prescribing but to discuss the issue with senior doctors.

A minority of doctors wanted a subservient pharmacy service. The majority were simply glad that pharmacists were not aggressively promoting the extension of their role. Pharmacists were aware that doctors may be sensitive regarding perceived incursions into their professional territory, but often attributed greater significance to this than was necessary thus inhibiting service development.

"They are very good and very sensitive in interacting with patients and doctors, maybe overly sensitive with doctors. They could be passing out sheets with how and why things are done with antibiotics and so on but they're not doing it for the junior doctors, and it's not because they're not keen to do it but because they're over sensitive. They say for example 'Do you mind awfully if we write in the notes?'. They are maybe overly sensitive to trying to impose themselves on the hospital prescribing habits here and they underestimate themselves. With older consultants, 10 years ago perhaps they couldn't do it but they could with the newer ones who are less likely to take exception to a more assertive pharmacy approach. " (Clinical Director)

Yet at a site where pharmacy had taken a strong line with a medical specialty there had been a failure to get services established partly due to medical sensitivity to criticism. The best relationships appeared to exist where pharmacists adopted a helpful, advisory approach, recognised their limitations, and avoided appearing to try to do the doctor's job.

"Pharmacists fall into two categories. Some are aware of their knowledge not being practical like doctors. They recognise this limitation and temper their judgements accordingly. They are the most useful. Others that don't see that, they're no good. " (Consultant)

A senior pharmacist felt that the term "clinical" pharmacy may appear to be aggressive but only a few older doctors were worried by terminology. Most were more concerned about the difficult task of delineating the respective profession's roles.

"It's difficult to maintain the line of difference between what doctors and pharmacists do ". (Consultant)

Doctors in specialties that depend on colleagues for referrals, hence work, such as microbiologists and clinical pharmacologists, may be threatened more by some pharmacy services, such as therapeutic drug monitoring (TDM). This had been the experience in several hospitals. In contrast, those in specialties that traditionally have a multidisciplinary team approach, such as geriatric medicine and anaesthetics, were likely to welcome pharmacy input.

"Some people couldn't work in a team, like orthopaedic surgeons, Most doctors treat pharmacists like surgeons do, 'do this and do that'. An open minded attitude helps. It depends on the specific problem. It tends to be the people who are required to work in a multidisciplinary team looking at the whole patient problem. They are very aware they need all the others in the team to help treat the patient's problem". (Consultant)

The doctor-pharmacist relationship was complicated by the perceived position of the consultant as the head of the care team. The were seen to be responsible for making decisions after listening to advice from members of the multidisciplinary team. Doctors felt also that they were ultimately responsible for the care of patients and must, therefore, retain the prescribing decision.

"It has to be clear that the responsibility is the doctor's since the doctors ultimately do the prescribing. I don't think you can have more than one person taking responsibility for that. There's lots of room for pharmacists to become more involved with the decision-making process. " (Clinical Director)

Doctors were used to making decisions in areas of relative uncertainty and did so with a knowledge of the entire patient and knowing that the responsibility for decisions lay with them. Some thought that pharmacists failed to realise this and, also, failed to appreciate the difference between the knowledge bases of the respective professions.

"Sometimes they don't have the whole picture. Doctors are really the only ones who have it all. You get input from the nurses on the social problems, from the pharmacists on the pharmacology. The doctor fits the whole lot together". (Senior House Officer)

Doctors tried to prevent others making decisions outside the team situation because they would have no knowledge or control over the activities of professionals working alone.

"It would concern me if we didn't have a daily ward round. It gives me an opportunity to go through every item of a patient's care in detail. So if there had been a significant change it's picked up then. Then if M (pharmacist) and a junior had made a decision we'd be able to look at it. If not I'd be worried because although M has acquired particular insight in ITU that's not probably so in all cases. " (Clinical Director)

9.2.2.3. Lack of need for pharmacy services.

Whereas most doctors welcomed pharmacy input into care, there was recognition that specialist doctors and nurses, such as clinical pharmacologists and diabetic nurses, often knew more than pharmacists in their specific area. They, therefore, did not use pharmacists as much

as others but did use them in various ways, such as in providing specific types of information, helping refine policies and providing financial information.

"We do have a specialist nurse counsellor and a lot of nurse-patient interaction. I'm not sure a pharmacist could add anything. " (Consultant)

"Respiratory is a fairly restricted field as regards drugs. So we're fairly familiar with the things that we use normally. You want somebody who's more in touch with what's available and has information on delivery devices rather than pharmacology really. " (Registrar)

"He (Director of Intensive Care) *also said that because the doctors are post-graduate doctors they're taught to be self-sufficient, to think 'Is there a paper in this for me?' So the pharmacy should not see it as a failure if the doctors don't ask the (research and information) questions of them.* (Clinical Pharmacy Manager)

"In DI with having the top-heavy structure in medicine that we have here you don't always get inquiries from within their field. A lot of things are about side effects and the queries that we get are often the more complicated ones. " (Specialist Pharmacist)

"With patient counselling. The view was that that was the nurses' domain. They're there seven days a week and they're quite knowledgeable (specialist nurses) *but then again the next ones mightn't be. I wrote up a protocol on nebuliser therapy. At the time she* (sister) *said it would be useful. "* (Ward Pharmacist)

"I hear what you are saying but the area here where we give cytotoxics and where they are reconstituted is restricted. It's not every Tom. Dick and Harry on the wards or in outpatients that do it. We do have staff trained to do that". (Nurse Manager)

In areas where the drug budget was small there was a similar lack of demand for the provision of financial information by pharmacy.

"In some directorates the drug budget is not a big issue. There, the quality of care, not costs, is important. In reality, we may have to concentrate on the big spenders and neglect others to some extent". (District Pharmaceutical Officer)

"The XXX wards didn't buy our service after one year. They never saw or had a money problem. So we were not so important to them. " (Pharmacy Services Manager)

"ENT (Ear, Nose and Throat), *their drugs spending is very small and the range of drugs that they use is relatively small. They're pharmacy friendly but they have no need of us so we are not going there. "* (Pharmacy Services Manager)

"For some directorates money is not an issue so cost is just used as a starting point, a way to get in. For example, in ITU (Intensive Care Unit) *it's* (the pharmacy service) *seen as a means of advising on drug use. In respiratory it helps control costs. In Paeds* (paediatrics) *where things are more procedure driven, pharmacists are more involved in that. Surgery and cardiology are not high cost areas so the interest is in pain control".* (Clinical Pharmacy Manager)

9.2.2.4. Hospital organisational issues.

Hospital organisational issues that posed threats for pharmacy were the organisation of wards and specialties, procedures on wards such as the holding of drug charts centrally, hospital politics and poor hospital information systems.

Many recognised that mixed wards (those containing patients under the care of several consultants) placed greater strain on pharmacists in providing services.

"You have to be broader here, to have a broader knowledge since more is done here. It's the only unit with every specialty. So I'm sure it puts the pharmacists under stress working up here. " (Sister)

Pharmacists thought that it reduced the ease with which services such as self medication might be provided, for example if some patients on the ward were likely to pose a hazard.

"There's a few problems there (with the self-medication scheme). *CCU* (Cardiac Care Unit) *also get the overdose patients. While ideally one would like patients medicines to be in a locker by the bed she's* (Sister) *against it because of the overdose patients. There were all sorts of questions about what sort of cover* (insurance) *you'd have. In the end we are starting with the medicines in one cupboard at the nurses station.* " (Ward Pharmacist)

Doctors felt that mixed wards reduced the pharmacists' interactions with junior doctors because the doctors were based on several wards.

"We do utilise pharmacy fully up to a point. Here we are faced with the problem of the pharmacists being based on the wards but the doctor is not". (Consultant)

Split hospital sites also posed organisational problems for pharmacy.

"Being on two sites is difficult. My office is on the other site. This site can't justify two basic grades. There's a chief tech (technician) here but she won't take on the checking role. It really irritates me. It's such a waste since I have to check things off. " (Specialist Pharmacist)

The provision of pharmacy services by ward pharmacists was centred around the drug chart. At a few sites, these were held centrally on some or all wards for no apparent reason. Nurses said it was the system; pharmacy said that it was because the doctors did not want the patients knowing which medicines they were receiving.

"I was really annoyed that the drug cards were in a file not at the end of the bed. Discussions with pharmacy didn't get me very far at the start. I suppose it was more convenient for the pharmacist. " (Senior Registrar)
"I think the drug chart is better on the end of the bed but it takes longer, that's its only disadvantage. It takes longer if you have to physically go around the beds. The patients and relatives also have access to the drug chart and know what's on it - it's one of the doctors' objections to it. " (Specialist Pharmacist)

The separation of patients from their drug charts made it difficult for pharmacists to see patients in parallel with their drug therapy, as has been recommended by many clinical pharmacists, and inhibited interaction with patients.

"A big plus (of having the drug chart at the end of the patient's bed) *is that you get to see the patient and they know who you are. They also learn that they can ask you about the drugs".* (Specialist Pharmacist)

Pharmacist were unwilling, sometimes, to challenge the system even where they considered it poor. At other sites, pharmacists preferred the centrally held charts since it prevented patients delaying them and speeded up ward pharmacy. Obviously there is a gap between the theory and practice of clinical pharmacy.

Pharmacists felt, occasionally, that internal hospital politics had negative repercussions for pharmacy services. If, for example, pharmacy was seen to be siding with the DTC (Drug and Therapeutic Committee) against powerful consultants, this could inhibit the development of services in areas controlled by those consultants. In addition, there may be political reasons that prevent, or facilitate, the development of particular services at specific times.

The development of CIVAs happened because I put my energies into it. We were behind. It was embarrassing not to have it. The push factor was junior doctors hours (reduction). We got a lot of requests from the more enlightened doctors". (Chief Pharmacist)

The poor state of development of hospital financial and clinical information systems interfered with pharmacy provision of good drug expenditure information at several sites and prevented its provision at one site. The under-development of information systems also meant that pharmacy could not trace the effects of their service on patient outcomes, since refined outcome data were not collected. Instead, pharmacy had to use patient satisfaction surveys as a proxy for service effectiveness data.

"You can't get hold of a readmission rate in this hospital. The poor information means that you can't quantify the quality of care other than to conduct a survey and you know that's fraught with difficulties. You can't sell a service unless you have the information to support it. The (hospital) information system is down the tubes here." (Clinical Pharmacy Services Manager)

9.2.2.5. Lack of knowledge of the pharmacy service and its potential benefits.

Pharmacists often felt that non-pharmacists knew little about their services or their skills. Likewise, non-pharmacists frequently said that they did not request services because they were unsure of pharmacists' skills or the range of services on offer.

Many nurses and doctors admitted that they did not know what pharmacists could do and pharmacy often made little effort to inform them of their potential contribution. As a result, they did not think, automatically, of involving pharmacy in new ventures appropriate to their skills such as CIVAs, counselling and policy making. Some of this was due to the absence of information on hospital pharmacy grading structures.

"I feel they have the right amount of knowledge although I've no idea what the grading and hierarchy is. I don't even know how pharmacy is laid out regarding the grades and career structure. I'd like to be told that so I can grade the information that I get on the expertise of the provider and their seniority." (Clinical Director)

Several said that pharmacy should define their services, particularly if they spent little time on the wards or if the hospital was large.

"The problem is, because we don't know what the pharmacists' duties are, we don't ask." (Registrar)

Non-pharmacists' expectations of the pharmacy service depended usually on their experience of the service, which meant that, generally, expectations were low and limited, and were often confined to dispensing, distribution and prescription monitoring. Many nurses and doctors had no experience of pharmacists actively contributing to patient care and, hence, they did not think that they did contribute. This applied to many of the ward pharmacy services as well as more esoteric ones such as TDM.

"Pharmacists contribution to patient care? God I don't know. Give me a clue. Directly they don't contribute to patient care. Indirectly, they just provide a pharmaceutical service. They have no remit with patient care directly that I can recall". (Nurse Manager)

The lack of interaction between the pharmacy and medical professions during their training, and subsequently in hospital practice, was recognised as a factor limiting the two groups appreciation of their respective skills and contributions to care. Some thought that efforts to increase contact between the professions would increase co-operation.

"The whole issue is that they have not got any inkling that pharmacists have the skills that they have. Now they have even more like the diplomas and MSc (Masters in Science). A lot of doctors still think that pharmacists are technicians. They don't cross paths. ... I felt that if doctors and pharmacists shared their training early on it would help reduce the ignorance." (Clinical Pharmacologist)

Such increased communication could help also to reduce any tendency for doctors to treat pharmacists as servants and to counter pharmacists' often-held view that doctors consider them lesser beings. Where increased communication had been achieved, inter-professional relationships were more productive and mutually respectful.

"In the early '80s the pharmacist was an old lady. She was very good but she seemed very critical. All the staff were afraid of her. She was a mini-dragon but really quite soft hearted. She frightened everyone. She spent a great deal of time on the unit. She looked at the prescription charts and snarled about them and told the consultant about them but did little else. We all relaxed when she went back to the pharmacy. It's better in every way now. People (pharmacists) are interested, communicative and tactful. They have a broader base of information and they're much more collegial too. You can discuss problems with them and develop it so a solution is found." (Consultant).

Several pharmacists identified the tendency in training to encourage nurses and doctors to be independent professionals, to think on their feet and be self-sufficient, as a barrier to their use of pharmacy services. Junior doctors also admitted that this was a factor in reducing their use of the pharmacy service. Their training did not emphasise the contribution that pharmacy could make to multidisciplinary care hence they did not look elsewhere for help.

"Not everyone realises what we can do. A lot of juniors (doctors) *and nursing staff don't realise the information sources that we have access to. Possibly it's because of their own training. They were told how to look for information and the pharmacy wasn't mentioned. "* (Ward Pharmacist)

In addition, doctors, pharmacists and nurses each have their areas of interest and often may not appreciate the importance of other professions to patient care. Doctors may not appreciate the risks associated with the use of drugs possibly because the risk of a catastrophic incident has been reduced by the ward pharmacy services, minor errors in prescribing are rarely life-threatening and their effects on patients' quality of life are difficult to measure. This reduced the perceived value of pharmacy services.

"I would agree it's a safety measure (pharmacy). *It's often difficult to identify its contribution. It's only when a catastrophe occurs that you notice it. We need pharmacy to pick up on the bits that can go wrong. Most of the time we don't use them as a safety mechanism because we don't see errors. Pharmacy's effect is really at the margin. The number of times that an error in prescribing will affect the patient or cause his death is very low. In the patient context you don't see the effect. Nobody measures it".* (Consultant)

Furthermore, pharmacy's recent move, at some hospitals, to control drug use solely on financial grounds was antagonising junior and senior doctors. Whereas clinical directors wanted pharmacy's help to control budgets it was important that this was done in an educational way that improved doctors' use of medicines and the quality of care.

"The problem is when clinicians feel that pharmacy is working to a budget. Then if a clinician needs a drug - a drug that helps get the patient out of the hospital faster - it's really getting into arguments about whose budget it's coming out of - or a drug may stop the need for surgery - I don't think we have the machinery in place to track that. " (Consultant)

A few doctors felt that, as in the 1960's, pharmacists had become isolated.

"Pharmacists are more highly trained and isolated now. Pharmacists are in danger of becoming purveyors of compounds that cost money. " (Clinical Pharmacologist)

The lack of appreciation of pharmacy services by clinical directorates was highlighted by Howe[18] as a possible weakness of the internal contracts for pharmacy services. Her results, and those of a DoH study[446], found that some pharmacists advocated increased marketing of services to counteract any adverse effects.

9.3. Summary of the SWOT Analysis - Comparisons with barriers to the development of Pharmaceutical Care in United States.

This section provides a summary of the SWOT analysis. It aims also to set the results in

context by comparing them with evidence from the United States on the barriers that exist to the development of pharmaceutical care[462,463].

The opportunities and threats to the future development of pharmacy services have been described in this chapter. Opportunities included an increased emphasis on cost control, the devolution of budgets to directorates, the complexity of therapy, the move to multidisciplinary care and care in the primary sector and patient empowerment. Smaller sites offered particular opportunities for integration with other disciplines. The threats facing pharmacy consisted of the devaluation of training and other features of short-termism in trusts, pharmacy role development presenting challenges to the roles of doctors and nurses, and the general lack of knowledge of the services offered by pharmacy. Sometimes, hospital organisational factors, and the lack of need for pharmacy services in particular specialties, were threats.

In Chapter VIII pharmacy's strengths and weaknesses were described. Briefly, its strengths arose from the profession's power base and the abilities of pharmacy managers. Pharmacy acquired power based on its knowledge base, its ability to reduce uncertainty, its authority to provide services and the power of individual members of pharmacy staff. Managerial strengths were pharmacy's ability to manage budgets and to use technology and skill-mix to provide services efficiently. Pharmacy's weaknesses included its managers' failure to assess and to meet organisational needs, to initiate and manage change and to provide leadership, and a vision of the future, for their staff. Pharmacists' lack of belief in their effectiveness and in the effectiveness of pharmacy services, their unwillingness to accept uncertainty and to move to true multidisciplinary working, and their lack of patient orientation also were identified as weaknesses. The poor layout of pharmacy departments sometimes interfered with the appropriate provision of services.

Many of the barriers to the provision of pharmaceutical care in hospitals that were emphasised by delegates at a special American Society of Hospital Pharmacists conference[462] in 1993 bear remarkable similarities to the weaknesses and threats pertaining to UK NHS hospital pharmacy that have been described in this chapter and in Chapter VIII. The American list included lack of resources, limitations of technology or the failure to embrace it, poor co-ordination of care and communication, lack of understanding of the concept of pharmaceutical care, lack of skills and professional and administrative obstacles. Their definition of pharmaceutical care emphasises pharmacists' overriding duty to care for individual patients. They also named other

obstacles, such as the historic segregation of clinical and non-clinical aspects of pharmacy, which are due to peculiarities in the development of pharmacy in the United States. Hithertofore these features were thought to be inapplicable in the UK but such segregation could occur in the NHS if sections of the hospital pharmacy service, such as drug supply and distribution, are contracted to external commercial firms.

9.4. Summary.

Chapters VIII and IX have considered the strengths and weaknesses of UK NHS hospital pharmacy, and the opportunities and threats facing it at present. A tentative proposal on the future role developments was made in Chapter VII. The next chapter will combine a discussion of the results that have been presented in Chapters VII-IX and a conclusion. The chapter will include a summary of the main results of the project. It will discuss the principal limitations of the research and describe potential further research. It will depict the future clinical role of the hospital pharmacist and describe the implications of the SWOT analysis for hospital pharmacy. This will lead to a conclusion that looks to the future and makes proposals for changes that the profession should consider to facilitate future developments.

CHAPTER X

DISCUSSION AND CONCLUSION - THE FUTURE FOR HOSPITAL PHARMACY

10.1.Introduction.

This chapter serves several purposes. It will summarise the results of the three research studies included in the project, namely the questionnaire surveys, the literature review and the interview survey. It will contain also a description of the future clinical role of the hospital pharmacist based on the triangulation of the results of the three studies above. The future role will be presented in the form of a job description for a clinical pharmacy services manager. The results of the SWOT analysis will be interpreted in light of the role that is depicted in this job description. This chapter will explore the limitations of the project and hence will clarify the research questions that have been generated. Finally, the changes that the profession should consider if it wishes to optimise its contribution to care will be defined.

10.2.   Summary of the Research Project

10.2.1.   Preliminary Research.

Preliminary research, which included a literature review, interviews with pharmacists and attendance at pharmacy-orientated conferences and meetings, helped refine the aims and objectives of this project. It showed that there was disagreement within hospital pharmacy regarding the definition of the term "clinical pharmacy". Clinical pharmacy practice varied. So did opinions on the direction that future developments should take. Furthermore, several barriers and opportunities to the further development of the clinical role of the hospital pharmacist were voiced. Many perceived barriers to progress lay within pharmacy. In particular, pharmacists' attitudes, their lack of certain skills, their neglect of customers' opinions and their failure to promote and evaluate pharmacy services were thought to be limiting development. It was thought that pharmacists should increase their communication skills and become more involved in the assessment of customers' needs, market research, and service promotion, documentation and evaluation.

10.2.2.   The Aims of the Project.

The aims of the project were to:

(i)   ascertain the clinical roles which hospital pharmacists have adopted in the UK;

(ii)   discover the extent to which these reflect official descriptions of clinical pharmacists' roles;

(iii)   summarise the results of evaluative research on hospital clinical pharmacy roles;

(iv)   determine the views of providers and professional recipients of hospital clinical pharmacy services on present roles and on future role development;

(v)   elucidate reasons for roles already adopted and perceived barriers and facilitators to role expansion.

(vi)   create useful models of clinical roles for hospital pharmacists in the reformed National Health Service (NHS) to guide service development.

10.2.3.   The Results of the Questionnaire Surveys.

These results fulfilled the first two aims, namely to define the clinical roles that pharmacists have adopted in UK NHS hospitals and to discover the extent to which these reflect official descriptions of clinical pharmacists' roles.

The first questionnaire survey was carried out during January-March 1992. It inquired about hospital clinical pharmacy service provision, within Districts and their equivalents, to professionals, patients and institutions in primary care. The response rate was 91.5% (193/211).

The provision of services was found to be extremely variable but generally limited. Many Districts provided information to primary care recipients, such as General Practitioners (GPs), nurses, community pharmacists and other primary care health professionals and institutions. Educational and advisory services were provided by fewer Districts. Levels of service provision were highest for primary care nurses. Service provision to community pharmacists, and patients in the community, was low and communication between hospital pharmacists and their primary care pharmacy colleagues was uncommon. Primary care institutions were provided with services by a moderate proportion of Districts. Special Health Authorities (SHAs) provided few services which is consistent with their lack of a relationship with local populations. Service provision in Northern Ireland was low. This was unexpected, since primary and secondary care has been well-integrated in the province, but may be due to the relative under-development of clinical pharmacy there. Service provision was higher in Districts where The Way Forward[2-4] and the Nuffield Report[5] were thought to have increased resources. Respondents' comments suggested that hospital pharmacies were becoming involved increasingly in the provision of services to primary care. The barriers to service provision were lack of resources, perceived competition from Family Health Service Authority (FHSA) Pharmaceutical Advisors and the attitude that community, rather than hospital, pharmacists

should provide such services. More encouragingly, hospital pharmacists' awareness of the importance of, and need for, their contribution to the provision of health care in the primary sector, and the potential for payment for any services provided, could stimulate service development.

Another questionnaire survey was carried out in mid-1992. It examined clinical pharmacy service provision in individual hospitals. The response rate was 89.8% (416/463).

The results showed that some clinical pharmacy services, such as prescription monitoring, support for clinical trials and active participation in Drug and Therapeutics Committees (DTCs), were available in almost all hospitals whilst others, such as education for medical students and doctors, residency, infection control and anticoagulation control services, were available in only a few. Some hospitals provided many services but most provided a moderate number. Associations were found between service provision and increased numbers of pharmacists and the presence of specialist clinical pharmacists and those with higher qualifications. A critical mass of pharmacists was required for the provision of a range of services. There seemed to be systematic variation in the provision of services between teaching and non-teaching hospitals, and between constituent countries of the UK and SHAs. An association was noted between the provision of services and perceptions of increased resources due to The Way Forward[2-4] and the Nuffield Report[5]. The provision of some clinical pharmacy services influenced the likelihood that others would be provided. Barriers to the provision of some services were inferred but no variables that were measured in the questionnaire were useful in predicting the provision of individual services.

Service provision in 1992 agreed in broad terms with the recommendations made in The Way Forward[2-4], the Nuffield Report[5], and the statements on clinical pharmacy made by the United Kingdom Clinical Pharmacy Association[7] and the Regional Pharmaceutical Officers' Committee[6]. Most services that were recommended in three or more documents were provided frequently; the exceptions were adverse drug reaction (ADR) monitoring and therapeutic drug monitoring (TDM). Some services that were recommended were not inquired about, and other services were provided although not recommended, but the recommendations made had, in general, been adopted.

10.2.4.   The Results of the Literature Review.

Evaluative literature on UK hospital clinical pharmacy services was reviewed. The review sought to determine if pharmacy interventions were economically effective and improved patient outcome. Searches yielded a multitude of publications, few of which were evaluations. For each service examined, evaluative studies were ranked according to study strength, size of effect and generalisability.

The services examined were; medication monitoring, formation of hospital drug policy, drug information, advice on therapeutics, specialist services provided within multidisciplinary teams, education for hospital health care personnel, involvement in research, services provided directly to patients, quality improvement, specialist services such as central intravenous additives (CIVAs) and TDM, and services provided to primary care. In general, few evaluations had been carried out on these services. Where evaluations had been performed, they were limited in scope (concentrating mainly on short-term process and output variables), subject to potential bias and confounding and produced results that were not generalisable. In particular, sound economic studies and studies on outcome were lacking. Assessments of the need for a service were performed for some services but often with the aim of showing a need for a pharmacy service rather than to assess true need. This section of the project generated an extensive research agenda.

10.2.5.   The Results of the Interview Survey.

Interviews were carried out at eight hospitals chosen to encompass as wide a range as possible of the characteristics considered to be relevant. These included teaching status, pharmacists' characteristics, hospital location, extent of clinical pharmacy service development, pharmacy leadership reputation and exposure to change. Interviews usually lasted 45 minutes and were carried out with 129 people, including doctors, nurses, pharmacists, managers and pharmacy technicians. The data enabled definition of the clinical role of the hospital pharmacist and the performance of a SWOT (strengths, weaknesses, opportunities and threats) analysis of hospital pharmacy

Many of the roles currently performed by UK NHS hospital pharmacists were identified and considered to be appropriate by all interviewees. The supply role was recognised as a core function. Interviewees also spoke of established clinical roles, such as the provision of therapeutic advice, and newer roles, such as those in primary care. There was unanimity

within pharmacy, and between pharmacists and non-pharmacists, on some roles and services, such as the provision of information, but disagreement on others. Within pharmacy there was disagreement on the control of drug levels on the wards, provision of education for doctors, participation in ward rounds, provision of out-of-hours services and prescribing. Disagreement existed between pharmacy and nursing on the education and empowerment of patients and between pharmacy and medicine on the provision of TDM and on prescribing. Nevertheless, pharmacists were considered to have a large potential role in the provision of health care via several of the established services and through extension of their roles in the hospital, at the interface and in primary care.

The interviews generated data on pharmacy's strengths and weaknesses, and the opportunities and threats that exist in the environment. Pharmacy's strengths were its power base (consequent on its knowledge base, its ability to reduce uncertainty, its authority to provide services and the power of individual pharmacists), and the ability of pharmacy managers to control budgets and to use technology and skill-mix to provide services efficiently. Pharmacy's weaknesses included its managers' failure to assess and meet organisational needs, to initiate and manage change, to lead their departments, and to provide an overall vision for the service. Other weaknesses were pharmacists' lack of belief in their own effectiveness and the effectiveness of pharmacy services, their unwillingness to accept uncertainty and to move to true multidisciplinary working, and their lack of patient orientation. Opportunities for pharmacy to develop further were provided by the increased emphasis on cost control, the devolution of budgets to directorates, the increasing complexity of therapy, the move to multidisciplinary care and care in the primary sector, and patient empowerment. Threats facing pharmacy included the devaluation of training and other features of short-termism in trusts, the development of pharmacy roles that challenge the roles of doctors and nurses, the general lack of knowledge of the services offered by pharmacy, hospital organisational factors, and the lack of need for pharmacy services in particular specialties.

10.2.6.   The Triangulation of Results.

The results of the questionnaire and interview surveys, and the literature review, were triangulated. This summarised and integrated the evidence that exists in support of various clinical roles and the services that fulfil these roles. It also yielded a tentative proposal for the future clinical role of the hospital pharmacist. Elements of the role included the provision of advice, information and education to health professionals, a contribution to the economic and

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effective use of medicines and increased contributions to team care.

Based on the results of the triangulation, and bearing the results of the SWOT analysis in mind, a proposed model of the future clinical role of the hospital pharmacist is presented below.

10.3. A Proposed Model of Clinical Pharmacy Practice.

This model will depict the roles that would be adopted by pharmacists if practice were based on the evidence provided by the triangulation of results. The limitations of the literature data have been borne in mind, thereby enabling roles to be proposed where other data were very supportive. The model is a proposal. It characterises roles rather than services. Based on the data collected, some services that could fulfil certain roles are suggested but this does not imply that these are the only services that pharmacy could use to fulfil these roles. The model is presented in the form of a job description for an imaginary clinical pharmacy services manager who would perform the roles with the help of other pharmacy staff. The results of the SWOT analysis have been taken into account in this model but a fuller description of the implications of the SWOT analysis is provided in the subsequent section.

10.3.1. Job Description - Clinical Pharmacy Manager.

You will be professionally and managerially accountable to the chief pharmacist and, through him/her, to the clinical directors with whom the pharmacy holds contracts. You will be responsible for managing the staff, services and resources of the clinical pharmacy section of the department. This will be in accordance with the business plans of pharmacy and of the hospital, to help meet the hospital's contracts with its purchasers and to discharge pharmacy's professional duty to patients.

Your prime responsibility will be to provide advice on the optimal use of medicines in the hospital. This will necessitate the direct involvement of you and your staff, individually and as part of multidisciplinary care teams, in advising on drug therapy for individual patients and groups of patients. In co-operation with various non-pharmacy staff and multi-disciplinary groups, you will be expected to initiate, implement and evaluate drug policies. To aid your performance of this role, you will have access to financial and clinical process and outcome data on the integrated hospital information system, IHIS, which supports the pharmacy

computer system. You will use IHIS to obtain financial information on drug use. This will be combined with appropriate clinical advice to assist clinical directorates with the cost-effective use of medicines and the adjustment of prescribing and care policies. IHIS also includes several programs that facilitate the provision of high quality care. It enables you to access information, such as records of adverse events and patient medication histories, to make routine records of your activities and input into patient care, and to record any prescribing by clinical pharmacists within agreed multidisciplinary care protocols.

You will be responsible for the drug information service. The manager of the drug information centre (DIC) will be accountable to you for the provision of drug information to staff and customers. The resources of the DIC will be at your disposal to assist you in providing education for hospital staff (pharmacy and non-pharmacy) and patients. Although you will be entirely responsible for providing clinically-orientated education for staff, you may draw upon expertise in pharmacy and non-pharmacy departments to help you provide it. In accordance with your staff education role, you will actively participate in several disciplines' post-graduate education committees. To facilitate your patient education role, you or your representative will be a key member of a number of multidisciplinary care groups that are concerned with policy and activities in patient education in hospital and at the interface. You will have a key role, with the chief pharmacist, in the creation and maintenance of contracts for the provision of education and information to pharmacy's customers.

Research will form a routine part of your section's work. You will be expected to support and aid the completion of several ongoing projects many of which are co-operative ventures with other professionals in the hospital. We are presently establishing firmer links with other sites to promote multicentre studies. This should allow you to further develop your research interests. In addition to research, you will be responsible for the assurance of a quality clinical pharmacy service. Data from IHIS, including pharmacists' activity data, pharmacy service process and outcome data, and customer satisfaction data, will be available to assist you in this endeavour. You will represent pharmacy in multidisciplinary audit and quality assurance fora and will, where necessary, be provided with pertinent service monitoring information on other sections of the pharmacy by the relevant managers. You will participate closely with other pharmacy managers and various multi-disciplinary teams and committees to provide a co-ordinated supporting service for clinical trials.

You will liaise with the pharmacy services manager to faci itate the provision of clinical pharmacy services during normal working hours and outside these hours. Recently, normal working hours have been extended in line with the activities of clinical staff. To enable such service provision, you will have an input into the organisation of pharmacy staff activities and will be updated monthly regarding alterations to the hospital workload and the working patterns of non-pharmacy staff. In co-operation with managers in other sections of the pharmacy department, you will ensure that safe, effective and high quality medicines are reliably procured, stored and supplied to hospital patients and departments. This will include dialogue with the manager of the manufacturing section of the pharmacy department to assist in the appropriate provision of special products and IVAs, such as parenteral nutrition, routine intravenous products and cytotoxic therapy.

You will consult with the pharmacy managers responsible for interface and primary care issues to assist in the organisation of clinical services for patients discharged from, and admitted to, hospital care. Where necessary, you will confer with nursing, community pharmacy and other colleagues involved in this area to ensure the smooth transfer of patients across the interface. In all cases you will have provided a discharge report prior to the movement of patients from hospital to primary care.

10.3.2.   Caveats to the Job Description for a Clinical Pharmacy Manager.

The above job description is a hypothetical one. It is not written as a prototype for the provision of pharmaceutical care in hospitals. It makes assumptions regarding the information technology that is available and refers to an imaginary position in a large pharmacy department. It does not specify services, nor who should provide them, but concentrates on defining pharmacy's clinical roles. Consistent with the results of the SWOT analysis, it emphasises the provision of care by multidisciplinary teams, the monitoring of the processes and outcomes of that care within pharmacy and in the hospital, and the advisory and consultative nature of most clinical pharmacy roles. It also tries to accentuate the interplay between the various sections of the pharmacy and between pharmacy and other professionals groups in the hospital. It extends clinical pharmacy roles to include functions at the interface and relationships with those in primary care. It recognises that trust hospitals may use internal contracts in the future and require pharmacists to monitor their performance and the quality of clinical pharmacy services.

This model for the future of hospital clinical pharmacy, and the results of the SWOT analysis, have implications for the profession. The next section will describe these implications.

10.4. The Implications for the Profession and Measures to Improve Practice.

Pharmacists were considered to be the reliable providers of safe, high quality, medicines and of services that support the cost-effective and optimal use of medicines. This included a role in reducing the uncertainty and risk associated with the use of drugs. There were few doubts in the minds of non-pharmacists about the soundness of pharmacy's knowledge base. Pharmacy can build on this, and on the expectations that others have of them, to provide services consistent with this knowledge base. Such developments include the provision of advice on optimal therapy, risk reduction and the cost-effective use of medicines, specialised manufacturing services such as IVAs, and educational services to professionals in hospital and primary care. There was also a presumption that pharmacists could participate in multidisciplinary teams that provide care to hospital patients and, directly or indirectly, to those at the interface and in primary care. Pharmacy's weaknesses may, however, restrict the adoption of these roles.

The failure of pharmacy to assess and meet the needs of the hospital may cause problems. Pharmacy departments must assess the services that are currently provided against the needs of the hospital. These include the educational needs of health professionals and other of staff, the developmental needs outlined in business plans, and the needs arising from the contracts that the hospital holds with purchasers. This may mean that senior pharmacy managers should become more proactive within the general management of the hospital and initiate meetings with relevant managers to inform pharmacy's assessment of needs. It may involve asking hospital health care workers, including pharmacy staff, to provide opinions on the services that pharmacy should provide. It could include an assessment of patients' needs and of the priorities for pharmacy services and an appraisal of other professions' roles in health care. The assessment of needs does not require, necessarily, extensive survey work but it must form part of an ongoing monitoring of the quality of services. Needs change and pharmacy managers must be aware of the direction and nature of these changes by being politically active in the hospital organisation. This will enable them to anticipate some changes and may facilitate greater involvement by pharmacy in decisions that affect it.

In addition to the assessment of needs, pharmacy managers must have a clearer vision for their service. This, ideally, would be informed by a national vision for hospital pharmacy. The Royal Pharmaceutical Society and various hospital pharmacy groups could play a key role in this endeavour. In the absence of a national vision, managers at a local level can create their own based on considerations such as the profession's duty to care for patients and the pharmacist's role in health care in relation to the roles of other health care workers. Such a vision has been proposed recently for pharmacy in the US by delegates at a special conference held by the American Society of Hospital Pharmacists[462] and by an individual[463]. Despite the important differences between the US and British health care systems, the US vision includes the movement of pharmacy towards multidisciplinary working in a system that integrates primary and secondary care, the provision of pharmaceutical care and the active participation by pharmacists in such changes. These issues are highlighted by the results of the present survey and in the suggestions for change that are made in this chapter.

Following an assessment of needs, and in combination with a professional vision of care, pharmacy managers must implement and manage change. This is a particular challenge for service departments, such as pharmacy, since their response must be consistent with changes in other departments, such as alterations in contracts with purchasers. Some pharmacy managers have failed to manage change effectively. The reasons for this may include a lack of training or an inability to put training into practice in the midst of constant environmental turbulence. This is where leadership from pharmacy's professional body would help by providing a frame of reference to guide pharmacy managers. In its absence, guidance from other sources, such as specialist regional units, may be needed, although these may be disbanded in the near future. The management of change must be continuous. It should include the development of services for the fulfilment of roles determined by assessments of needs, an appraisal of the pharmacy skill-mix, and the training and routine management of pharmacy staff to ensure that high quality services are provided. Delegation and leadership are particular areas in which pharmacy managers may need to focus attention. This could help reduce the negative effects of pharmacists' lack of belief in their ability to provide services that improve care.

The management of change could assist, also, in increasing interprofessional co-operation and the participation of pharmacists in multidisciplinary teams. The results of the interview survey show that pharmacists are not participating fully in team care despite their, and others',

perceptions that they should. In addition, the directorate system, anticipated recovery pathways and patient focused care have changed the focus of health care from the hospital (the organisation providing health care) to patients treated in the hospital. The majority of clinical pharmacy services may, ideally, be provided closer to the patients and the teams that care for them. Pharmacy services must, therefore, change from pharmacy- or professional-centred to patient-centred. Although this may entail significant changes in pharmacy service organisation and delivery, the benefits are potentially large. Pharmacists may be better able to utilise their knowledge and, thereby, to optimise their contribution to care. The manner in which care is provided in individual hospitals may differ. A patient-centred approach may have been adopted in some whilst in others a more traditional approach may have been retained. Pharmacy must respond to the needs in whichever system has been chosen and develop services accordingly. They must do so, however, with a clear idea of their role as optimisers of the use of medicines. This includes a duty to care for individual patients to improve their outcome and quality of life plus a duty to patients in general to optimise scarce resources so more patients can avail of care. The contradictions in these duties may cause conflict for some pharmacy departments especially if one or other approach has been followed, to the detriment of the other, in the past. Consideration may be needed of the equity of service provision.

Changes in service delivery may necessitate consideration of the potential uses of information and other technology to increase service effectiveness and efficiency. Investment is required in technology that enables pharmacists to remain in patient care areas for longer, increases their knowledge of patients and therapeutic decisions, helps monitor the outcomes of care, and accelerates pharmacy's responsiveness to requests for drug supplies. Pharmacists have a broad knowledge of technology and must use this to further their roles in the provision of care. Increasingly, however, general managers may focus pharmacists' minds on these issues by demanding greater proof of pharmacy's contribution to care and to the hospital as an organisation.

Given current resource constraints in hospitals, changes in services may require a quest for additional funding. It seems likely that the devolution of drug budgets to clinical directors will be followed by the creation of internal contracts between the clinical directorates and various service departments. Pharmacy managers must overcome their fear of these contracts and market the pharmacy service aggressively to purchasers in primary care as well as to those in the hospital. A key threat to pharmacy was non-pharmacists' lack of knowledge of the service

and its contribution to care. To survive the NHS changes, and acquire funding to enable further development, pharmacy managers and the professional body must take steps to ensure that key decision makers, such as contract managers, are aware of the contribution that the pharmacy service makes to the provision of high quality care. Within the hospital, pharmacy managers need to ensure that all their services are fully funded. Particularly vulnerable services are information and continuing education for pharmacy staff. These must be costed and the cost passed on to purchasers of the pharmacy service if no central funding is available. Pharmacy's representative bodies could assist in ensuring that continuing education for pharmacists is protected by national agreements such as those that are in place for doctors.

Increased participation in multidisciplinary team care will require pharmacists to view their role in terms of a contribution to team care rather than as the provision of pharmacy services. There was a need for many pharmacists to re-discover their duty to patients, as opposed to a duty to professionals, especially doctors, and to bring this duty more to the fore in the design and provision of services. Pharmacy education could emphasise this duty and the importance of providing services in accordance with it. Furthermore, the education of pharmacists at all levels should recognise the indeterminate nature of some aspects of professional knowledge. This could help pharmacists accept and handle uncertainty in health care. Many aspects of pharmacy practice, such as manufacture and dispensing, demand precision. Clinical roles, however, entail greater uncertainty. Pharmacists may be ill-equipped to cope with the challenges presented to them in fulfilling these roles. Greater emphasis on a pharmacy team, led by senior pharmacists with expertise in making decisions in areas of uncertainty, could be used to deliver the necessary training to less experienced pharmacists.

Several proposals for change have been made here some of which demand a radical re-think of the reasons for, and the manner in which, pharmacy services are provided. Change may appear to be difficult in the present climate. Nevertheless, change may be made more easily when little is defined rigidly. In addition, pharmacists are well-equipped to face change. They have increased their skills, knowledge and potential ability to contribute to patient care. With a greater focus on their duty to care for patients and on multidisciplinary working, they will be well-equipped to make the necessary transitions.

This research project aimed to define the clinical role of the hospital pharmacist and thereby to guide such changes. Limitations in the quality of the evidence that was available in the

literature in particular, and limitations of the research in general, must be taken into account. The following sections describe the limitations and pose questions for further research.

10.5. Limitations of the Research.

This research looked at clinical pharmacy in the UK NHS during a period of rapid change. Although all aspects of the research were informed by extensive preliminary research, it is possible that the individual studies failed to cover all aspects of the clinical role. This is because the topics studied were mainly roles that had been adopted by pharmacists or were under consideration. A reality-driven approach in a time of change may, therefore, have resulted in failure to examine radical new roles for pharmacists and roles that may be adopted in the future. The results of the questionnaire and literature surveys are generalisable to the UK NHS. Those of the interview survey, however, are not statistically representative, although they are thought to provide a realistic picture of the common features and the diversity of UK hospital pharmacy. Some of the research findings may be applicable to community pharmacy in the UK and to pharmacy in other countries but the results are primarily limited to the UK NHS hospital sector. The proposed model for pharmacy practice is based on the triangulated results. The dearth of literature evidence may, however, have made this model more conservative than it could have been. Since the literature was felt to be lacking, a research strategy for hospital pharmacy has been proposed in Chapter V. The perceived lack of good quality literature was based on a particularly rigorous method of assessing the literature and it is possible that another researcher might have taken a different view.

10.6. Topics for Further Research.

The questionnaire surveys examined few services in detail and did not examine the entire range of services provided to primary care. The results suggested that various factors influenced service provision. Since 1992 the NHS changes have resulted in the demise of Districts and Regions and the almost complete conversion of hospitals to NHS trusts. The influences of these, and other ongoing changes, pose interesting questions about pharmacy services. Have they changed and, if so, in what ways? What factors have influenced any such changes?

The literature review generated a research agenda for pharmacy. Assessment is required as to whether certain services are required; for others the best method of meeting known needs should be considered. Full evaluations are required for all services although this may be more difficult for long-established services and those for which there are difficulties in separating pharmacists' contributions for those of other professionals. Where possible, evaluations should consider economic and patient outcomes, be multicentre studies that guard against confounding and bias, and take a broader view of potential costs and consequences of services. There is a particular need to examine the organisation and delivery of services to ascertain the most efficient methods of provision. Processes that consider the quality of services on an ongoing basis, such as audit and quality improvement services, are required. Ideally, these should follow on from evaluations of the effectiveness of the services in question. The basic questions are; What services are needed? Who needs them? Which services are effective? and How, and By whom, should they be provided for maximum efficiency?

The interview survey enabled the creation of a model for clinical pharmacy. There is now a requirement for action research to implement the model and refine it to reflect need in different types of hospitals. The results also highlighted the necessity for research to examine roles and services over which there was substantial disagreement. The model avoided defining the individual services that may be needed and the nature, manner and level of their provision. These are areas for debate and future work.

Several changes that were considered necessary for hospital pharmacy to achieve its potential contribution to care have been recommended in this project. Many of these necessitate an assessment of organisational needs within individual hospitals, and in pharmacy, and a consideration of various means of satisfying identified needs. Further work is required at policy-making, professional and hospital levels to ascertain the wider views of the profession regarding necessary changes and the most appropriate actions to facilitate changes on which there is agreement.

10.7. Future Directions.

The development of clinical pharmacy in UK NHS hospitals started from modest beginnings about twenty five years ago. Today, it is an accepted part of pharmacy practice. The concept of clinical pharmacy has been endorsed by the UK government and is widely supported in

hospital pharmacy. Pharmacists and non-pharmacists view the clinical role of the hospital pharmacist as an important contribution to the provision of efficient and effective health care. Clinical pharmacy has helped pharmacy gain greater acceptance as a profession and helped pharmacists become members of the multidisciplinary health care team.

This project has helped define the clinical role of the hospital pharmacist. This role will, however, continue to evolve and much of the power enabling future developments lies with pharmacists. The results presented here may facilitate development by indicating where there is agreement and disagreement on roles, where evidence exists and is lacking for those roles, what factors are important for future developments and what directions future developments should take. It is for the profession, and others with an interest in the efficient provision of effective health care, to consider the ideas presented and adapt those that are pertinent to facilitate progress in their own areas. The final paragraphs provide views on potential uses of the ideas emanating from this project.

Hospital pharmacy managers can learn much from these results that will assist them in developing appropriate roles and services. The results identify the roles that are most appropriate and current deficiencies in services. They also indicate where changes may need to be considered and the types of alterations that may be required in the nature and provision of services. Practising pharmacists, and the profession in general, should obtain confidence from the results since they show that pharmacy services are needed widely and very much appreciated. The opinions expressed by non-pharmacists may, in particular, help pharmacists to recognise the value of their contribution to health care and to achieve their potential. The professional body, and various representative organisations, may wish to use these results to stimulate discussion within the profession, to promote the pharmacists' role in health care and to direct future research and education in pharmacy. Other pharmacy institutions involved in the provision of education and the performance of practice research may gain ideas also from the project.

Policy-makers, in pharmacy and in health care generally, may wish to note the evidence presented for various pharmacy roles and services. By also defining the barriers to service development, this project may assist in the creation of policies that facilitate the development of high quality, cost-effective, health care. Institutions involved in health service research and planning may obtain ideas for future research and development. Other professions, and health

service managers, may view pharmacy's contribution to hospital health care in a new light and thereby form ideas on multidisciplinary developments that involve pharmacists to a greater extent in the provision of health care.

The clinical role of the hospital pharmacist will continue to develop. Whereas developments in the past may have been driven by pharmacists' need to become more appropriately involved in the provision of health care, and by the profession's opinions on the necessary developments, those in the future may be shaped to a greater extent by external pressures, such as financial constraints, managerial power, customers' demands and the business-like nature of UK health care following the NHS changes. These external factors provide pharmacy with exciting opportunities for development. The opportunities can only be realised, however, if they are seized upon and the profession is willing to make the changes that are necessary for continued development.

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