MOVING FROM PAPER BASED TO ELECTRONIC HOSPITAL DISCHARGE SUMMARIES: A MIXED METHODS INVESTIGATION

By

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The University of Huddersfield in collaboration with the National Health Service Connecting for Health

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DECLARATION

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ABSTRACT

The move to electronic discharge summary systems was anticipated to solve the longstanding problems associated with poor data quality and reduce delay in the production and transmission of discharge summaries between secondary and primary care health care providers in the UK National Health Service. A consequence of investment in a national IT infrastructure for electronic health records has focused attention on template design and the IT system requirements. The routine practices of doctors involved in discharge summary construction, and other factors that contribute to the problems of delay and data quality, have been less well explored.

This study aimed to gain an understanding of paper-based discharge summary construction in a secondary care context in order to identify and analyse the implications for improving electronic discharge summary systems, and potentially avoid inadvertent transfer of inherent problems. A mixed method case study design was used to examine the patient discharge process and the construction of discharge summaries in one NHS Hospital Trust. Data was collected through semi-structured interviews with hospital doctors (n=10) and simulated discharge summary production (n=10). A syntactic analysis was also performed on discharge summaries (n=11) and proformas (n=3). The data was analysed thematically and inductively in order to identify the factors that contribute to the twin problems of data quality and delay associated with discharge summaries. The pragmatic, semantic, syntactic conceptual framework (Morris, 1938), and Speech Act (Austin, 1962) and Mental Frame (Minsky,1981) theories, were used to analyse how information contained in discharge summaries was represented, interpreted and used.

This study found that moving from a paper based to an electronic discharge summary system will not necessarily resolve the problems of poor data quality and delayed production of discharge summaries. More comprehensive solutions are required in order to facilitate more effective discharge summary communication between secondary and primary care health professionals, and to address entrenched custom and practice in current hospital practice. These include uni-professional (medical) orientation of discharge summaries, attitude of senior doctors, inadequate preparation of junior doctors, inconsistent data entry including absence of common usage of short forms and abbreviations, and little accountability for quality control.

Recommendations include training for junior doctors, regulating the use of shortened forms, improving the features of data entry systems, structuring the clinical coding data and introducing systems to ensure greater organizational accountability for effective discharge communication. More comprehensive change related to the introduction of multidisciplinary contribution discharge summary construction and integration of discharge summary standards in care pathways may improve overall discharge summary quality.

GLOSSARY

Term	Description
EHR	Electronic Health Record. Patient lifelong care records held, managed and owned by healthcare organisation.
HL7 CDA	HL7 Clinical Document Architecture. This is the HL7 template to derive the information model for a clinical document or records.
ICD	International Classification of Diseases. ICD is a clinical classification system for diseases used in NHS Hospital Trusts in England. The ICD data is collected by NHS Trusts to be used for epidemiology and national, and international, statistics on diseases.
NHS	National Health Service. NHS is the main healthcare provider in United Kingdom, funded through public funding.
NHS CFH	NHS Connecting for Health is the agency of the Department of Health of England, which is responsible for delivering NPfIT.
NHS CRS	NHS Care Record Service. NPfIT patient care records, which include the NPfIT SCR and detailed records held by local healthcare providers.
NPfIT	National Program for Information Technology is the initiative in England to reform IT systems in the NHS.
NPfIT SCR	NPfIT Summary Care Record. NPfIT SCR is part of the PSIS, which is a repository to store patient's summary care records authored by patient's GP, NH Trust doctors or other health professionals.
OPCS	The Office of Population, Censuses and Surveys Classification of Surgical Operations and Procedures. The OPCS data is collected by NHS Hospital Trusts for reimbursement of their services and also strategic planning and management.
QIPP	Quality, Innovation, Productivity and Prevention. QIPP is the recent NHS initiative to bring a greater scrutiny on the quality of NHS services.
RCP	Royal College of Physicians. RCP is an independent professional organisation for physicians in the UK.
SNOMED CT	Systemized Nomenclature of Medicine Clinical Terms is the comprehensive reference terminology, which resulted from the merger of SNOMED RT and Read Codes terminology. NPfIT adopted SNOMED CT as the standard reference terminology for the NPfIT implementation.
TTO	To Take Out. A term used to refer to a brief discharge summary completed on patient discharge.

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CHAPTER 1 INTRODUCTION

1.1 The genesis of the study

I was involved in a software development project to build the electronic outpatient medical record system for a hospital in Indonesia between 2007 and 2008. This experience fuelled my interest in the implementation of electronic health record (EHR), and also qualified me to be awarded the doctoral studentship for this study, which was offered as a collaborative project between the University of Huddersfield and the National Health Service Connecting for Health (NHS CFH).

NHS CFH, established in 2004, is the agency of the Department of Health, England, responsible for delivering the National Programme for Information Technology (NPfIT) for the NHS in England. The NHS is the main provider of public healthcare services in the United Kingdom. NPfIT is a national initiative to replace NHS IT in England with a more advanced IT systems that will link together health professionals from different care settings such as general practitioners (GPs), community health professionals, pharmacists and hospital practitioners. The NPfIT Summary Care Record (SCR) is one of the key elements in the NPfIT implementation plan, and will serve as a central repository of life-long EHR of NHS patients, and facilitate sharing of patient information across different care settings. The repository will store patient health information such as current diagnoses, medications, allergy, GP summary and discharge summaries.

NHS CFH plays a strategic role in the production of implementation standards and guidelines that contracted software providers must adhere to. The standards and guidelines are important to ensure the systems implemented by the different software providers *"talk"* to each other. Recently, NHS CFH published a specification for discharge summaries, which were planned to be part of the NPfIT SCR's content. NHS CFH and the University of Huddersfield collaborated to develop exemplars based on real patient notes (InContext, 2008). The patient notes were fully pseudonymised in compliance with the Data Protection Act regulations and ethical requirements, and they were used to populate a simulated

hospital software to provide a virtual learning environment for nursing students (Ward and Hartley, 2006). The collaborative project was executed by the university, while NHS CFH provided the funding, workplace supervision and support for the collaborative work. I was awarded a doctoral studentship offered by the University of Huddersfield to work on this project, which is the background for this study.

1.2 The research aim and objectives

The experience of working in the collaborative project with NHS CFH gave me insight into the current state of formalisms and standards used to support computability and interoperability of information exchange through electronic clinical records. Formalism is about the rigorous conformance to explicit specifications (Merriam-Webster Online Dictionary, 2010), and it is paramount for the computability of information. In order to support computability and meaningful use of electronic records, the terminology and information structure of the record both need to be formalised.

Interoperability is the ability of two or more systems to exchange information and to use the information accordingly (IEEE, 1990, p. 42). Interoperability within healthcare context was defined by the European Commission working group on e-Health as:

> *"the ability, facilitated by ICT applications and systems; to exchange, understand and act on citizens/patients and other health related information and knowledge; among linguistically and culturally disparate health professionals, patients and other actors and organisations; within and across health system jurisdictions in a collaborative manner."*
>
> *(Kalra et al., 2009, p. 10)*

The definition illuminates the extent and complexity of interoperability issues in the healthcare context. Standardisation is the key element to achieve interoperability. An interoperability standard is essentially a consensus on a particular aspect of clinical domain implementation.

The collaborative project with NHS CFH focused on testing the NPfIT discharge report specification with real patient data, and providing exemplars of the report. The NPfIT discharge report specification was modelled using health interoperability standards. This doctoral study went beyond the scope and objectives of the collaborative project. The placement within the project influenced this doctoral study in two significant ways. Firstly, the experience attracted me to gain a better understanding of various aspects related to the construction of discharge summaries in real life practice. Patient discharge summaries are the main, and often the only, interface to transfer information from hospitals or secondary to primary care providers when a patient is discharged from hospital. The hospital doctor responsible for the patient's care is required to write a discharge summary that would normally contains the detail of the patient's episode of care and follow up information. Discharge summaries play a vital role in ensuring patient safety in the transfer of responsibility for the patient care's from secondary to primary care providers.

An initial review of literature, presented in Chapter Two, indicated that the effectiveness and quality of hospital discharge summaries were major issues for many NHS Hospital Trusts in England. The poor quality of the data and the delayed in receiving discharge summaries were the two main concerns raised by GPs (Adams et al., 1993; Farguhar et al., 2005; NHS Alliance, 2007). Most studies related to discharge summaries used a survey approach, discharge summary record audit, or randomised control trials (Kripalani et al., 2007). The literature revealed few studies providing insights regarding the current hospital practice and other factors which may contribute to the problems associated with discharge summaries. The inquiry into this area is best pursued through qualitative methods. Studies that involved hospital doctor participants mostly focused on building consensus of standard content for discharge summaries and used quantitative methods. This study aims to contribute new knowledge in this research gap by employing a qualitative method, and using the data collected from hospital doctor informants.

Secondly, working on the collaborative project introduced me to various concepts that are relevant to formalism and health interoperability standards. I have utilised these concepts in the development of the conceptual framework for this study, in order to explore the various aspects of discharge summaries. Interoperability issues in the healthcare domain have the pragmatic, semantic, syntactic dimensions (Ingenerf et al., 2001; Pokraev et al., 2007). These concepts originated from the study of sign, called semiotics, which was influenced by research and development in the disciplines of linguistic and philosophy.

This doctoral study used the pragmatic, semantic, and syntactic taxonomy to explore the various aspects associated with the construction of discharge summaries and the implications for improving discharge summary systems. Speech Act and Mental Frame (Searle, 1969; Minsky, 1981) theory were used to explore semantic aspect of discharge summaries. The conception of this study is presented in a more detail in Chapter Two. The overall aim of this study is:

"To gain a better understanding of various aspects related to the construction of discharge summaries, and the implications for improving discharge summary systems".

In order to achieve this aim, a number of research objectives were developed:

1. To investigate current hospital practice associated with the completion of a discharge summary.

2. To identify hospital practice and other factors that contribute to the problems of poor data quality and delayed discharge summaries.

3. To explore the pragmatic, semantic, and syntactic aspects of a discharge summary.

1.3   The organisation of the thesis

This introductory chapter gives a brief overview of the conception of the research aim and objectives. The remainder of this thesis is organised as follows:

Chapter Two presents the literature review conducted for this study. The review begins with the context and current hospital practice associated with the completion of discharge summaries. The subsequent sections of the chapter review a number of aspects of discharge summary record keeping, the current known issues, the impact of the deficiencies in discharge summaries, and various interventions aimed at improving discharge summary systems. The literature review concludes with a discussion of the research gap and the development of the conceptual framework for this study.

Chapter Three describes the research methodology. This chapter begins by stating the research paradigm and the methodology chosen for this study. This is followed by an explanation of the research design, data collection, and the approach used for data analysis. The final section presents the considerations regarding research ethics and research rigour in conducting this research.

Chapters Four and Five present the findings in relation to the research objectives. These chapters present the findings from the interviews and simulations of completing a discharge summary with a number of research participants (n=10). Chapter Four starts by exploring the patient discharge process and the completion of discharge summaries in the case study NHS Hospital Trust. This chapter concludes with a discussion of the hospital practice and other factors that contribute to the problems of poor data quality and delayed discharge summaries. Chapter Five explicates the pragmatic, semantic and syntactic aspects of a discharge summary based on the data analysis of this study.

Chapter Six provides the thesis discussion, which integrates the results presented in Chapter Four and Five. This chapter offers ten key findings that expand the existing body of knowledge, and the implications of these insights for improving discharge summary systems. The chapter summary reviews the contribution to new knowledge from this study.

Chapter Seven concludes this thesis. This final chapter begins by revisiting the research aim and objectives stated in Chapter One. This is followed by the presentation of the research summary, the limitation of the study, the implications for further research, and the final remarks.

CHAPTER 2 LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK OF THE STUDY

2.1 Introduction

In England, as in the rest of UK, healthcare services are predominantly provided by the National Health Service (NHS). The NHS, established in 1948, is the main healthcare service provider for the 51 million residents in UK. In 2009, the NHS employed more than 1.7 million people including 120,000 hospital doctors, 40,000 GPs, 400,000 nurses and 25,000 ambulance staff (NHS, 2009).

NHS healthcare services are divided into primary care and secondary care. This healthcare service structure is ubiquitous with the advent of specialist approach in healthcare services (Mant et al., 2002; Watcher and Goldman, 2002). Primary care services are delivered by a range of health professionals such as GPs, dentists, pharmacist, nurses, and midwives. GPs have a specific role in coordinating patient care in primary care, in liaison with other community health professionals, and they are also the first point of contact when a patient may need specialist care from secondary care providers (Stille et al., 2005). Secondary care is provided in the hospital or other secondary care settings and accessible through either a planned admission, for example by a referral by the patient's GP, a referral by an outpatient consultant, or an emergency admission.

Historically, the completion of discharge summaries was solely an internal documentation of a patient's episode of care in hospital (Krip, 2007). With the division in healthcare services, a discharge summary became an important means for communicating and coordinating patients continuity of care following discharge from hospital. Hospital doctors often rely on a discharge summary to notify and inform the patient's GP about a patient's episode of care and their follow up care needs. This transfer of responsibility for the patient's ongoing care presents potential health, social and housing support risks to the patient (Department of Health, 2003). Given its significance, it is important to ensure that the completion of a discharge summary and record keeping are undertaken appropriately.

In the NPfIT blueprint, discharge summary records are designed to be part of the NPfIT SCR, the centralised NHS patient EHR, and would be accessible to any authorised health professional involved in the patient's care. In this national level implementation, electronic discharge reports have to be specified according to strictly defined interoperability standards to ensure the records can be used safely across different care settings and clinical applications. In line with the NPfIT programme, NHS Hospital Trusts are now required to achieve the delivery of a discharge summary within 24 hours following a patient discharge (Department of Health, 2008). This was an attempt to encourage NHS Hospital Trusts in England to implement an electronic discharge summary system through the NPfIT programme. Unfortunately, the implementation and delivery of NPfIT software by the contracted software providers have been much delayed and deadlines have been missed. Due to the delays, many NHS Hospital Trusts have begun to develop their own implementations to achieve the target of 24 hour post-discharge receipt of a discharge summary. However, the local implementation plans may not share the same interest with the NPfIT agenda in terms of achieving the goal of nation wide interoperability and meaningful use of the records.

Currently, there are at least two major changes that will influence how implementation of electronic discharge summary in England will progress. The first change is the plan to shift the commissioning power, in regard to IT procurements, from a centralised approached, to a local and distributed approach, controlled by consortia of GPs in primary care. Whether this dramatic change will be beneficial, or not, to progress NHS IT reform is yet to be seen. The second significant change is the emerging paradigm of *"connect all"* as an alternative to the unsuccessful NPfIT *"replace all"* approach[1]. While the *"replace all"* approach attempts to *"force"* NHS Hospital Trusts to replace their IT systems, the *"connect all"* approach focuses on facilitating the connectivity between existing IT systems used by the NHS Hospital Trusts. This new directive spurred the

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[1] Christine Connelly's keynote speech at the British Computer Society Health Care Conference on 28 April 2009.

development of the NHS interoperability toolkit (ITK)[2], which provides interface specifications for linking the different pieces of existing software systems. The ITK discharge report was specified using the same set of interoperability standards as the original NPfIT discharge report, but it removed a number of requirements and constraints in the original NPfIT discharge report specification in order to reduce the barriers for implementation. The attempt to support full semantic interoperability will be achieved gradually.

The recent trend of moving to electronic discharge summary systems has also spurred many new investigations on the current practice associated with the construction and transmission of discharge summaries. This chapter presents the literature, which explores the current knowledge about different aspects of discharge summaries. The literature search was initially undertaken using a search engine called Metalib, which aggregates search results from multiple literature databases. The databases included in the search were ACM Digital Library, Science Direct (Elsevier), PubMed Central, BioMed Central, Sage Publication, MEDLINE, SpringLink, Compendex, Emerald Journals, Electronic Journals Service, and the University of Huddersfield's library catalogue. The search phrases included the keyword "discharge" in combination with one or more of the following keywords: summary, letter, paper-based, dictated, electronic, planning, process, transmission, communication, GP, doctor, hospital, patient, practice, record keeping, standard, content, proforma, deficit, structure, systematic review, improvement, improving.

Only literature in the English language from 1990 onward had their abstracts reviewed for inclusion. Those retrieved were interrogated on the basis of their relevance to discharge planning, record construction and transmission. Articles that contained descriptions of specific health care settings, e.g. mental health or related to long term illness or specific conditions, and those which contained only

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[2] Information source from http://www.connectingforhealth.nhs.uk/systemsandservices/interop

descriptive accounts with little linkage to construction of discharge summaries and challenges of implementation were excluded. Any references identified in the selected articles, but not identified by electronic searching, were retrieved. Non-peer review articles such as NHS Trust policy documents were found using Google.

The literature review is presented in the following order in this chapter. Firstly, the review looks at the practice of completing discharge summaries within the context of patient discharge planning. The next section explores a number of important aspects of discharge summary record keeping and the known issues in its current practice. The subsequent sections present the impacts of discharge summary deficits, and the potential interventions to improve discharge summary systems. The final section presents the research gap and explicates the conceptual framework of this study.

2.2   Discharge summary: context and practice

A discharge summary is one of the clinical records produced within hospital care settings. Clinical records are defined as:

> *"any information relating to the physical or mental health or condition of an individual that has been made by or on behalf of a health professional in connection with the care of that individual"*

> *("Data Protection Act 1998," Section 68)*

A discharge summary facilitates the transfer of responsibility for a patient's care from hospital to GPs. The completion of a discharge summary is part of patient discharge process. Ideally, patient discharge should be managed as an ongoing process and planned as soon as, or even prior to the patient being admitted to hospital (Department of Health, 2003). The generic medical record keeping standard, standard number 11, published by the Royal College of Physicians (RCP) in England, mandates that the discharge summary record to be commenced at the time the patient is admitted to hospital (Carpenter et al., 2007).

Patient discharge planning is important to minimise unnecessary medical costs and to optimise the outcomes of patient care (Farrington-Douglas and Brooks, 2007; Mukotekwa and Carson, 2007). Patient discharge planning has been shown to limit hospitalisation costs through shortening the length of hospital stays, readmission rates and patient discharge delay (Shepperd et al., 2010).

Additionally, patient discharge planning can minimise the risks related to lengthy or prolonged hospitalisation that can contribute to delays in patient discharge. Prolonged hospital stays are well known to affect patients physically and emotionally; patients are more susceptible to infections and may lose confidence and independence (National Audit Office, 2000). Patient discharge planning aims to prevent risks on patient discharge by ensuring the planning of health, social and housing support for the patient after discharge from hospital (Department of Health, 2003). A lack of planning is associated with health risks, such as cognitive impairment, mobility problems, medication errors (Department of Health, 2003; Pharmaceutical Services Negotiating Committee, 2006). The social risks are associated with a delay in providing the social care support for the patient. The guidelines published by the Department of Health of UK (2003) require that the patient's health, social and housing support needs and any potential risks are identified early on after the patient's admission, and that they are addressed appropriately when the patient is discharged from hospital. This illustrates that the patient discharge requires multidisciplinary coordination.

Within that context, a discharge summary plays a significant role as the formal interface between secondary and primary care providers; it is an important means of communication between hospital doctors and GPs (Mann and Williams, 2003; Pullen and Loudon, 2006). The record contains the information related to the patient's episode of care in hospital and the follow up care arrangements. This information allows the patient's GP to make informed decisions related to the patient's continuity of care, and avoids repeating tests unnecessarily (Wyatt and Wright, 1998; Pullen and Loudon, 2006).

More often a discharge summary is the only communication interface between hospital doctors and GPs regarding to the patient's discharge (Kazmi, 2008). The reluctance to use other communication means may be due to the organisation culture and the habitual working practices of hospital doctors (Dunn and Markoff, 2009). Interestingly, handovers in nursing are commonly in oral format rather than written. Hospital nurses often communicate with district nurses in primary care via telephone in order to coordinate the continuity of nursing care for the patient. This variation of communication style mirrors the different ways of working of health professionals, even within the same healthcare organisation.

As a clinical record, a discharge summary can be used for secondary purposes which are not related to the patient's care. Discharge summaries can be used as evidence for medico-legal investigations, clinical audit and handling complaints and inquiries (Pullen and Loudon, 2006; Royal College of Physicians, 2008a), training and education (Ward and Hartley, 2006) and research purposes (Bertrand et al., 1998; Elkin et al., 2005; Zhou et al., 2006). For healthcare service providers, discharge summaries are essential sources of information for generating reports for management purposes such as billing, audit, resource allocation, service planning and performance monitoring (Mann and Williams, 2003; College of Physicians and Surgeons of Nova Scotia, 2008; Royal College of Physicians, 2008a). Discharge summaries are also used as sources for clinical coding to contribute to national health statistics, which are important for epidemiology and public health strategy and policy making (Scott, 2004; Pullen and Loudon, 2006).

The following description presents a typical scenario of what would normally happen when a patient is discharged from hospital. On patient discharge, a junior doctor on the ward produces a brief discharge summary which is sent to the patient's GP (Midgley, 1996; Wills et al., 2011). The data is entered in different ways: typed, hand written, photocopy of all or part of medical notes, computer generated text or even sticky labels giving basic information (Wass and Illingworth, 1996). In many hospitals, a copy of the brief discharge summary is

also given to the patient with the expectation that the patient will bring the letter in the next visit to their GP. This ensures that the brief discharge summary is available to the patient's GP when the patient visits them (Kripalani et al., 2007). Some time after the patient discharge, the responsible consultant or other senior member of the care team will dictate a more detailed discharge summary. The consultant's secretary will transcribe and type it as a formal letter. The author signs the letter before it is sent to the patient's GP (Midgley, 1996; Wills et al., 2011).

Midgley (1996) described the brief discharge summary as a temporary record, and suggested that only detailed discharge summary letter should be kept as part of the patient's medical record. Moreover, the detailed discharge summary should include all information in the brief discharge summary. In the electronic discharge summary record, the assumption is that only one discharge summary letter, the detailed one, is required, and the record would be available electronically on patient discharge (Wills et al., 2011). In a paper based system, managing and archiving discharge summary records appeared to be an important issue for GPs as they preferred small paper size (A5) records (Adams et al., 1993; Midgley, 1996; Wass and Illingworth, 1996). However, this is unlikely an issue in an electronic based system. The delivery methods for discharge summary letters can include the post, the hospital's shuttle bus services, fax, email, or via the patient and electronically through electronic record systems (Midgley, 1996; Kripalani et al., 2007).

2.3   Aspects and issues of discharge summary record keeping

The discharge summary record keeping is expected to comply with the general principles of clinical record management (Department of Health, 2006, 2009), and the guidance provided by the local NHS organisations and relevant health professional bodies (Worcestershire NHS PCT, 2007; Royal College of General Practitioners, 2008; SouthPort and Ormskirk Hospital NHS Trust, 2008). Clinical

record keeping covers broad aspects of record management, including the creation, use, retention, appraisal and disposal of clinical records. However, within the context of this study only the aspects related to creating and using the clinical records are relevant. This section presents the different aspects of good clinical record keeping, and the known issues associated with discharge summaries.

2.3.1 Data Quality

The data quality of clinical records is one of the most important aspect of NHS information governance. The clinical content should be legible, factual, consistent, accurate, concise, relevant and complete (Department of Health, 2007). Each data entry must be dated, timed and authenticated (Carpenter et al., 2007). The content needs to be up-to-date since new information can potentially alter the interpretation of previous data (Walsh, 2004). Clinical information is expected to be recorded as soon as possible after care events (College of Physicians and Surgeons of Nova Scotia, 2008; Royal College of Physicians, 2008a). Clinical records with good data quality reduce the time needed to search for missing/incomplete information (Yell, 2007).

Unfortunately, poor data quality of discharge summaries is one of the main sources of complaints from GPs. The problem of illegible handwritten records were well documented (Uslu and Stausberg, 2008; Wills et al., 2011). The handwritten records were often problematic to read as a consequence of the necessity for rapid data entry. Generally, typed and electronic clinical records were preferred by GPs for legibility reasons (Adams et al., 1993; Wass and Illingworth, 1996; Wills et al., 2011). The level of medication errors and inaccuracies in discharge summaries were identified as the major concerns in a survey of GPs (NHS Alliance, 2007). The failure to communicate complete information about changes to the patient's medication was reported as one of the most critical health risks associated with discharge summaries (Pharmaceutical

Services Negotiating Committee, 2006). In a recent systematic review study about discharge summaries, a lot of important and relevant information was also found to be missing, inaccurate or poorly represented (Kripalani et al., 2007). The problems included the incorrect name of the consultant in charge, no information about follow up appointments, no discharge date and missing diagnoses or symptoms. GPs also complained about inaccuracy and ambiguity of the information contained in discharge summaries (Wills et al., 2011). These included mentioning investigations without details of the results, which may lead to repetition of the tests, ambiguity in interpreting blank fields and the use speciality-specific acronyms.

2.3.2 Structure and format

Another important aspect of good clinical record keeping practice is the use of an appropriate and recognised structure and format for the recording. The structuring and formatting can be applied at document-level, section-level, within clinical statements, and the details within the clinical statements. A structured format comprises a structured text with headings, tables, diagrams, graphs, or animations. Each of these elements has its own benefits and disadvantages and should be used appropriately (Wyatt and Wright, 1998). A narrative format provides greater flexibility and expressivity for hospital doctors to put down complex clinical information (Mori and Consorti, 1998), but most studies show that GPs prefer structured discharge summaries compared to those with a narrative format (Adams et al., 1993; Rawal et al., 1993; Van Walraven et al., 1998; Carpenter and Bridgelal Ram, 2008a).

Structured discharge summaries improve the completeness and accuracy of data entry, and can be used for introducing triggers (red flags) to alert clinicians to possible patient safety risks (Carpenter and Bridgelal Ram, 2008b). They also enable a faster data entry, which is the major reason for their preference in Intensive Care Units (Bertrand et al., 1998). Structured discharge summaries also

improve the effectiveness for retrieval, interpretation and decision making (Wyatt and Wright, 1998; Pullen and Loudon, 2006). They facilitate better information recall and comprehension for non-expert clinicians such as junior doctors (Sharda et al., 2006a). The structured format is even more important in an electronic record environment as computer systems are more capable of exploiting structured data than narrative data (Los et al., 2005; Royal College of Physicians, 2008a). Moreover, a structured record is generally shorter and quicker to read and easier to be transformed into an electronic format (Rawal et al., 1993; Van Walraven et al., 1998).

Despite the many advantages associated with a structured discharge summary, this format presents a substantial challenge for data entry. A structured record requires more discipline to write (Rawal et al., 1993). It also increases the data entry burden of hospital doctors as structured format is not natural for clinical reasoning (Walsh, 2004). A structured format is also less expressive, and a lot of contextual information present in the original narrative data will be lost when transformed into a structured format (Walsh, 2004). Consequently, there is a need to balance between the strength and weakness of structured format when using it for structuring a discharge summary. The other issues related the structuring and formatting of a discharge summary include poor grouping of related information, illogical presentation order, the absence of a highlighting mechanism for critical information, the distraction of empty fields and irrelevant headings (Wills, 2008).

2.3.3 Accessibility and availability

Lastly, good clinical record keeping is also measured by how effectively the clinical record can be used. Accessibility and availability are fundamental for the effective use of clinical records. Ensuring access to clinical records for different health professionals is important for the continuity of patients' care (Audit Commission, 1999). Paper based discharge summaries are still common in current practice, and known to have limitations related to access and availability. Paper

based clinical records cannot be accessed simultaneously by different health professionals, and are often structured for data entry and not for data retrieval (Wyatt and Wright, 1998), and this is a limitation in multidisciplinary care environments. Moreover, the information presentation in paper based discharge summaries cannot be adjusted to different information needs in the multidisciplinary care environment.

Ensuring availability in paper discharge summary systems will rely on the timely delivery of the record by hospital practitioners. Unfortunately, delayed receipt of the discharge summary is the major concern of GPs, aside from the data quality issues. A recent systematic review showed that GPs often had not received the discharge summary, neither the brief nor the detailed one, by the time they saw the patient; the incidence rate reported in various study was between 16% to 53% for the brief discharge letter, and between 66% to 88% for the detailed discharge summary (Kripalani et al., 2007). The delivery delay of detailed discharge summary letter was more alarming, with most letters were delivered more than 4 weeks post discharge (Kripalani et al., 2007). This timeframe was viewed as unacceptable by GPs (Adams et al., 1993). Ideally, the detailed and completed discharge summary should be sent out on patient discharge. The accumulation of delays in dictating, typing, signing and sending out the letter were reported as the causes of the delays associated with detailed discharge summary (Farguhar et al., 2005). The delay in communicating the patient discharge information to the GP was a serious problem which can seriously affect patient care outcomes and resulted in preventable adverse events (O'Leary et al., 2006).

2.3.4 Standardisation

Thus, standardisation of content and structure of discharge summaries is an important aspect of discharge summary record keeping. The standardisation reduces ambiguity and potential omissions in data entry, ensures completeness, increases patient safety and quality of care, and supports health professional best

practice (Royal College of Physicians, 2008a).

Standardisation also provides better accuracy for clinical coding and data extraction for secondary purposes. Most importantly, standardisation is necessary for healthcare providers to comply with information governance and authority bodies' standards (Carpenter et al., 2007; Carpenter and Bridgelal Ram, 2008b; Royal College of Physicians, 2008a).

Unfortunately, the idiosyncrasy of the content and structure of discharge summaries are evident in current hospital practice; even within a single healthcare provider, an agreed structure and layout for the clinical records is rare (Wyatt and Wright, 1998). An examination by the Audit Commission (1999) revealed inconsistency in grouping information across different NHS Hospital Trusts (n=225). This variation can compromise patient safety due to the potential ambiguity and inaccuracy in interpreting clinical information. The variation also introduces inefficiency in overall healthcare systems because clinical records become less usable when they are used outside the originating healthcare provider (Royal College of Physicians, 2008a).

2.4   The impacts of discharge summary deficits

A discharge summary with good data quality and which is delivered promptly on patient discharge is the key to ensuring maximum safety in the transfer of responsibility for the patient's care from hospital to primary care providers (Alpers, 2001; Goldman et al., 2002). Unfortunately, deficits in discharge summaries are prevalent in current practice (Kripalani et al., 2007). Problems of poor data quality and delayed discharge summaries may lead to a lower quality of follow up care, risk of readmission and adverse medical events. Adverse events were often associated with medication errors, and the failure to communicate pending test results (Van Walraven et al., 2002; Moore et al., 2003; Roy et al., 2005). In one study, Roy et al. (2005) showed that 10% of patient cases with

pending test results were actionable, or required follow up, but neither the GPs nor outpatient the consultant were likely to be aware of the results when they became available. This presented serious medical risks to the patients. The deficits in discharge summaries impacted negatively on patient's and clinician's satisfaction, and caused suboptimal use of clinical resources, including unnecessary repetition of tests by GPs (Coleman and Berenson, 2004; Poon et al., 2004; Van Walraven et al., 2004; Wills et al., 2011).

2.5 Interventions to improve discharge summary systems

The division of labour and discontinuity of care between secondary and primary care means the deficits associated with discharge summaries are serious issues which need immediate solutions (Watcher and Goldman, 2002; Kripalani et al., 2007). Previous research on interventions to improve discharge summary systems has focused using computer-generated discharge summaries, changing the mode of delivery, and changing the structure and format of the records (Van Walraven et al., 1999; Mant et al., 2002; Rao et al., 2005). Moving to a centralised EHR system was seen as an alternative to rectify the many problems associated with paper based discharge summaries (Pullen and Loudon, 2006). EHR systems were often believed to unleash the capability of information and communication technology to support healthcare services.

A systematic review by Kripalani et al. (2007) on discharge communication concluded with the following recommendations: (1) ensuring the completeness with agreed content structure, (2) using proper structuring and formatting, (3) ensuring accuracy and faster data entry by using computer-generated data from the patient's medical record, (4) giving a copy of the discharge summary to patients and asking them to bring it with them on the follow up visits. Some studies suggested that introducing a formal education and training programme, and undertaking audits, with feedback, can help junior doctors to improve the quality and completeness of their discharge summaries (Myers et al., 2006;

Dinescu et al., 2011).

A more recent national initiative *"nurse-led discharge"* (Department of Health, 2004a) was proposed as a solution to cut the unnecessary delays in the patient discharge process, and to produce timely discharge summary for the patient with simple medical problems. The implementations by early adopters showed that NHS Hospital Trusts tended to interpret this initiative as the total transfer of responsibility for patient discharge from doctors to nurses (Rooney, 2010). The implementations showed mixed clinical outcomes (Office for Public Management, 2010). For example, some implementations reported an increase in the length of inpatient stay, while other implementations reported the reverse.

Within the context of NPfIT, there were two majors initiatives to improve discharge summary systems in England. In line with the NPfIT plan to reform NHS IT systems, NHS Hospital Trusts in England are now obliged to deliver discharge summaries to GPs within 24 hours after a patient discharge (Department of Health, 2008). The policy essentially requires NHS Hospital Trusts to implement an electronic discharge summary system with connectivity to the GP system. The original NPfIT plan was to encourage NHS Hospital Trusts to participate in the NPfIT programme in order to update their IT systems. Unfortunately, many NHS Hospital Trusts lost confidence with the NPfIT agenda due to failures/delays to deliver the promised IT systems. This has caused many NHS Hospital Trusts to commence the implementation of their own programmes, in order to comply with NHS policy.

The second initiative to improve discharge summary systems was the development of standard content structure for discharge summary records by the RCP, as part of NPfIT programme. In 2007, the Health Informatics Unit (HIU) of the RCP developed generic standards for medical record keeping (see Table 2.1).

Table 2.1 Generic medical record keeping standards by RCP

Standards	Description
1	The patient's complete medical record should be available at all times during their stay in hospital
2	Every page in the medical record should include the patient's name, identification number (NHS number) and location in the hospital
3	The contents of the medical record should have a standardised structure and layout.
4	Documentation within the medical record should reflect the continuum of patient care and should be viewable in chronological order
5	Data recorded or communicated on admission, handover and discharge should be recorded using a standardised proforma
6	Every entry in the medical record should be dated, timed (24 hour clock), legible and signed by the person making the entry. The name and designation of the person making the entry should be legibly printed against their signature. Deletions and alterations should be countersigned, dated and timed.
7	Entries to the medical record should be made as soon as possible after the event to be documented (e.g change in clinical state, ward round, investigation) and before the relevant staff member goes off duty, If there is a delay, the times of the event and the delay should be recorded.
8	Every entry in the medical record should indentify the most senior healthcare professional present (who is responsible for decision making) at the time the entry is made.
9	On each occasion the consultant responsible for the patient's care changes, the name of the new responsible consultant, and the date and time of the agreed transfer of care, should be recorded.
10	An entry should be made in the medical record whenever a patient is seen by a doctor. When there is no entry in the hospital record for more than four (4) days for acute medical care or seven (7) days for long stay continuing care, the next entry should explain why.
11	The discharge record/discharge summary should be commenced at the time a patient is admitted to hospital.
12	Advance Decision to Refuse Treatment, Consent, Cardio Pulmonary Resuscitation decisions must be clearly recorded in the medical record. In circumstances where the patient is not the decision maker, that person should be identified, e.g Lasting Power of Attorney.

Source: Carpenter et al. (2007)

The development of the standard was based on a review of published standards and wide consultations with health practitioners. The generic standards are applicable to any operational clinical records relating to hospital care, including discharge summary records; the standards can be applied to both paper and electronic records.

The subsequent work by HIU produced a list of approved headings/subheadings for structuring the content of discharge summaries (see Appendix 1). This development was based on an initial literature review and expert consultation which was then validated using a survey (n=1454) administered to hospital doctors and GPs (Royal College of Physicians, 2008b). The initiative also developed a paper proforma template for discharge summary records (see Appendix 2), which was piloted by hospital doctors (n=67) and GPs (n=20).

The work from the initiative also produced additional raw data that was worthy of further analysis. The headings such as *"patient detail", "source of admission", "destination address", "advance directives", "functional measures"* were more likely to be seen as significant by practitioners from mental health specialities rather than those from medicine or surgery. Interestingly, there was a significant gap in the level of agreement between the hospital doctor and GP participants in regard to the importance of headings such as *"source of admission", "destination address", "information given to patients",* and *"past medical history"*. The score for usability (76%) and clarity (61%) of the discharge summary proforma was the lowest when compared to other criteria, such as appropriateness and sufficiency. Most strikingly, there was a significant gap between hospital doctors and the GP participants about the prospect of the proforma improving data recording, quality of care and patient safety in current practice. Most GP participants were optimistic about the prospect, while hospital doctor participants were divided.

2.6 Research gap and conceptual framework

There are a number of gaps in current knowledge associated with discharge summaries that this study attempts to address. Firstly, there are no studies that explored in-depth the hospital practice and factors that contribute to the problems of poor data quality and delayed discharge summaries. Most studies related to discharge summaries used survey methods, discharge summary record audits, or randomised control trials (Kripalani et al., 2007), and were insufficient to explicate the complexity of hospital practice. One of the objectives of this study is to contribute new knowledge in this area by employing a qualitative method to explore in-depth the hospital practice and other factors that are related to the completion and problems of discharge summaries.

Moreover, most studies attempted to define the standard structure and the normative criteria for discharge summary content and format. Studies that explored how discharge summaries were created and used were apparently lacking. Very little has been written about the significance of different information in a discharge summary, and how they were presented, interpreted and used in real life practice. An understanding of these aspects can provide a better understanding of how current discharge summary systems can be improved. This study adopted a conceptual framework to augment the investigation of this research gap. A conceptual framework is useful to provide a structure to the research investigation and the analysis of findings (Carrol and Swatman, 2000). The development of the conceptual framework is elaborated next.

In the implementation of the electronic discharge summary, the semantic interoperability is the key element to enable greater and meaningful uses of the records (Kalra et al., 2009). Semantic interoperability is one of many facets of interoperability (Ingenerf et al., 2001; Gibbons et al., 2007; Lenz et al., 2007; Pokraev et al., 2007; Hammond, 2008; Gottschalk, 2009). The term *"semantic"* has its origins in the study of signs, known as semiotics. Semantics is one of three

branches of semiotics, and the other two branches are syntactics and pragmatics (Morris, 1938). The focus of semiotics inquiry is the relationships between sign systems and meaning in human communication. Most contemporary work in this field stems from two major competing theoretical traditions in the study of signs; the linguistic tradition developed by Ferdinand de Saussure (1857 - 1913), and the pragmatism tradition developed by Charles Sanders Peirce (1839 - 1914). In both these traditions, *"meaning"* is a consequence of signification, or the uni-directional relationship between a sign/symbol (signifier) and the object of reference (signified). However, in Peirce's model, a signification is always meditated through an intellectual agent (interpretant), as illustrated in Figure 2.1.

Source: Ogden and Richards (1923); Fiske (1982)
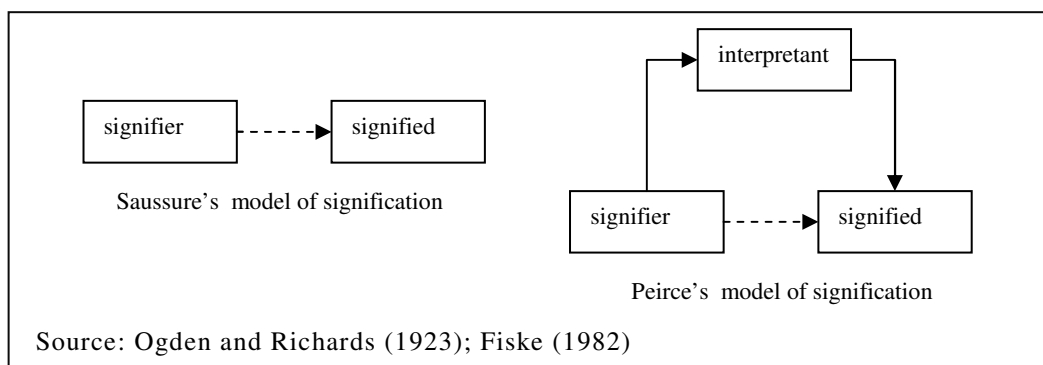
Figure 2.1 Signification in Saussure's and Peirce's semiotic models

Due to the difference in the model of signification, the development of the two models by subsequent authors became progressively divergent. Saussure postulated that the meaning of a word is relative to the overall structure and relationships between words in a language system. In Peirce's tradition, meaning is oriented toward pragmatism. Meaning is contextual, unstable, dependent on their interpretant and is negotiated through its uses in real life practice. The process of meaning making, or semiosis, is performed through the interaction between signifier, signified and interpretant. In addition, symbols in language systems are not only used for signification but also for reasoning (Chandler, 2002).

The subsequent development of Pierce's semiotic tradition led to the subject area being sub-divided into the inter-related broad areas of pragmatics, semantics and syntactics (Morris, 1938). In the original conception, pragmatic aspects include the origin, uses, and effects of signs. In a language system, a sign can be a word or a sentence. In the context of a discharge summary, a sign can be the discharge summary itself, or any of the elements of the documents. Semantic aspects are related to the significations, or relationships between the signs and the objects they refer to. The syntactic aspects describe the characteristics of the signs. In a language system, the syntactic aspects will include the language sentential grammar, and the language codes (lexicons and alphabets). In the context a discharge summary, the syntactic aspects are the structure or grammar of the content and the language codes used to express the clinical information.

While these sub-divisions are considered as discreet concepts, the boundaries between them are often contested (Carston, 2002; Barba, 2007; MacFarlane, 2009). An alternative view holds that these concepts overlap with each other. The aspects of intention and cognitive process, or inferential, of the intellectual agent (interpretant) often span across the pragmatic and semantic domains (Stekeler-Weithofer, 2005). The composition in a sign system is considered relevant to the pragmatic, semantic and syntactic aspects (Meulen and Abraham, 2004).

Using semiotic theory as a conceptual framework to explore phenomena in the clinical domain is a relatively novel approach. Dolgopolov (2009) used the semiotic theory to explore the semiosis of clinical diagnosis. This was the only identified study that had adopted concepts from semiotic theory and applied them to the medical practice. This doctoral study adopted the sub-divisions of pragmatic, semantic, and syntactic as the general conceptual framework to explore the different aspects of discharge summaries within the context of communication and interactions between health professionals. The investigation of semantic aspects of discharge summaries was augmented by two other theories; Speech Act

and Mental Frame. The relevance of these theories in this study is elaborated next.

In human communication, a word or sentence has both propositional and intentional meaning (Austin, 1962; Searle, 1969). In the context of discharge summary, the propositional meaning is related to the medical ontology and knowledge, while the intentional meaning is related to the intentions of the discharge summary author. This study focuses on the intentional semantic of a discharge summary. The intentional semantic was popularised by Searle (1969), who developed the Speech Act theory based on the concept introduced by Austin (1962) in his seminal book *"How to do things with words"*. Speech Act theory states that saying/writing statements equates to do actions. Searle classified five different intentional acts (illocutionary acts) that are often embedded in a statement: assertive, directive, commissive, expressive and declarative. Assertive statements attempt to describe the state of objects of interest in the world. Giving information is an example of an assertive act. Directive acts are intended to make the hearer do what is suggested in the statement. Giving advice, orders, or a request, are examples of directive acts. In a commissive act, the speaker commits themselves to do the things proposed in the statement. Making a promise or a vow are examples of commissive acts. An expressive act is the act to express the emotional state of the speaker. Lastly, declarative acts change the state of affairs in the world by virtue of the statement itself. A legal verdict is an example of a declarative act.

Speech Act theory was adopted in the formalism of HL7 information model (Schadow et al., 2000; Schadow et al., 2001). In the analysis of semantic aspect of discharge summaries, this study aims to identify various speech acts that are embedded in discharge summaries. This will help us to understand the interactions and intended objectives the health professionals attempt to achieve through information in discharge summaries.

Syntactic analysis was traditionally one of the areas of linguistic discipline, and often focused on the grammar rules for constructing sentences from words (Chomsky, 1957). However, in the context of a discharge summary, the analysis unit is information or documents, and not sentences or words. The analysis of the syntactic aspects of discharge summaries in this study focuses on the structure or grammar of the content, the characteristics of the language codes. The presentational aspects of the information in discharge summaries appears to be relevant and amenable for syntactic analysis.

Syntactic structure is arguably influenced by the existence of semantic structure, or mental frame (Minsky, 1981). In his seminal paper, *"A framework for representing knowledge"*, Minsky (1981) argued that one copes with real situations in the world by representing the situations cognitively, or mentally, using a kind of memory structure system called a frame system. The essence of his argument was expressed in the following statement:

> *"When one encounters a new situation or makes a substantial change in one's view of the present problem, one selects from memory a structure called a Frame. This is a remembered framework to be adapted to fit reality by changing details as necessarily"*

> *(Minsky, 1981, p. 1)*

Minsky's frames are mental schemas, templates or models, used to represent similar types of situations. Mental frames not only assist us to represent and comprehend real world situations, they also guide the reasoning and the action to cope with the situations. Thus, syntactic structures are essentially the reflection of the mental frames. This study attempts to develop hypothetical mental frames, based on the data of this study and the identification of different types of *"situation"* that exist in a discharge summary.

Using the Speech Act and Mental Frame theories, the information in a discharge summary was analysed in terms of (1) the health professionals who interacted through that information, (2) the speech act associated with that information (3)

the expected response from the receiver of the information (4) the required semantic structure necessary to facilitate the underlying interaction. This exploration is expected to provide a better understanding about the cognitive relationships between different types of information in discharge summaries within the context of interactions between health professionals.

In conclusion, through the adoption of the pragmatic, semantic and syntactic conceptual framework, along with the Speech Act and Mental Frame theories, this study aims to gain a better understanding of various aspects related to the construction of discharge summaries, and the implications for improving discharge summary systems.

2.7   Summary

This chapter presented a review of the literature relevant to this study. A discharge summary is the care transfer document and is critical for patient safety. Health professionals use a two discharge summary approach, as a consequence of the deficiencies in current hospital practice. The issues of poor quality of the data and the delayed receipt of discharge summaries, continue to be highlighted despite of various interventions have been proposed to improve the discharge summary system. The recent legislation and policy that mandates NHS Hospital Trusts to implement electronic discharge summary is expected to change this landscape.

Two areas of research were identified as appropriate to be pursued in this doctoral study in order to contribute new knowledge. The pragmatic, semantic, and syntactic conceptual framework along with Speech Act and Mental Frame theories were used to structure this research inquiry. This chapter has presented the background of the research aim and objectives stated in Chapter One. The next chapter will explain the methodology used to achieve the research aim and objectives of this study.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

Theory building and research are two interrelated activities, and research methods and their underpinning theoretical framework should be compatible (Denzin, 1989). One of the intentions of this chapter is to demonstrate this premise in the conduct of this research study. This chapter presents the research paradigm, methodology, design, execution of this study. The discussion will first locate the research paradigm, or theoretical framework of knowledge (epistemology) and reality (ontology) which this study subscribes to. This theoretical framework influenced the choice of research questions/objectives, methodology and design.

Most importantly, this chapter also demonstrates the rationale, ethics and rigour in the conduct of this research. Critical thinking is an attribute of rationality in academic work and is defined as follows:

> *"Critical thinking is the intellectually disciplined process of actively and skilfully conceptualising, applying, analysing, synthesising, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness."*
>
> *(Scriven and Paul, 1987, online)*

Critical thinking is crucial in terms of continuous evaluation of various aspects of research against academic standards implied in the definition above. This discipline should be applied when conceptualising, analysing, synthesising and evaluating information from different sources. Critical thinking requires an open minded attitude and willingness to change one's belief in the light of new evidence. This chapter attempts to demonstrate this academic quality, through the explication of choice of research paradigm, methodology, questions/objectives, design, data analysis and the writing-structure of this thesis.

Some reflexive commentary is provided to demonstrate the interaction between the author's own thinking and the research process. The argument of reflexivity practice is that objectivity is transcendent and unachievable, and undertaking research often requires the researcher to take a rational but partial and partisan perspective (Pels, 2000). Hence, reflexivity aims to demonstrate explicitly the researcher's authority in directing and constructing the research process and outcomes (Wasserfall, 1997). On the one hand, reflexivity is a way to recognise the researcher's preconceptions: beliefs, assumptions and objectives that influence research outcomes (Gilbert, 2008). On the other hand, the practice can be used effectively to demonstrate that the analysis and conclusions are not based on the researcher's opinion alone, but on an elaborated process of thinking (Young, 2009). Consideration of ethical issues and the academic rigour in undertaking this research are presented separately at the end of this chapter.

3.2   Research paradigm and methodology

The purpose of research inquiry is to verify, expand, and/or contribute new knowledge. However, research inquiry is not value-neutral, hence neither is the knowledge contributed through the inquiry. Research inquiry is influenced by the investigator's presumptions about the nature of knowledge (epistemological assumptions) and the nature of the reality that the knowledge is based on (ontological assumptions).

Traditionally, research in social science was divided between qualitative and quantitative research. These approaches were considered as having distinct paradigms (Philip, 1998). Proponents of quantitative methods are ontologically positivists or (naive) realists who assume that only an objective and observable reality exists. This is a dominant paradigm in natural science inquiry. In a positivist epistemology, knowledge is obtained through empirical observations in order to find regularities and patterns from the objective reality.

In contrast, proponents of qualitative methods are interpretivists, who believe in intangible and subjective reality. In an interpretivist epistemology, knowledge is constructed through social interactions. Multiple interpretations from the same data or phenomena are possible (Lathlean, 2006; McEvoy and Richards, 2006). Various characteristics of these competing research paradigms are presented in Table 3.1.

Table 3.1 Characteristics of quantitative and qualitative research

Quantitative research	Qualitative research
Hard science	Soft science
Objective	Subjective
Political	Value free
Reductionist	Holistic
Logico deductive	Dialectic, inductive, speculative
Cause and effect relationships	Meaning
Test theory	Develops, advances and reinterprets theory
Control	Shared interpretation
Instruments as data collection tools	Listening and talking, observation as ways of gathering data
Basic unit of analysis: number	Basic unit of analysis: word
Statistical analysis	Interpretation
Generalisation	Uniqueness/transferability

Source: Topping (2006)

In contemporary research, combining both quantitative and qualitative methods is an emergent practice in a range of disciplines including health and social and educational sciences (Becker, 1996; Cresswell, 2003; Johnson and Onwuegbuzie, 2004; Johnstone, 2004; 2005). This approach is called a mixed methods or multi strategy approach (Bryman, 2001; Brannen, 2005). A mixed methods approach allows greater creativity and flexibility in order to address the research questions and objectives (Brannen, 2005). This approach can be achieved by using a number of quantitative or qualitative methods or a combination of them.

Using multiple methods in research is not new in social sciences. What is new is the emergence of mixed methods as an alternative methodology to quantitative

and qualitative paradigms (Jonson et al., 2007). Brannen (2005) argued that this trend was contributed to by the recent growth in cross disciplinary, strategic, and practical research that aim to meet the needs of users, policy makers or cross-national agencies. Practical, or applied, social research often seeks to capture macro and micro aspects of a social phenomenon. The macro-level analysis employed a quantitative method and used national-level statistical data to seek larger scale patterns/trends and a descriptive explanation. The micro-level analysis employed a qualitative, or interpretative, method to explore contextual and subjective perspectives from respondents.

The macro versus micro analysis above illustrates a mixed methods approach that uses a complementary study design. This complementary mixed methods approach were also used in this study. Other rationales for use of a mixed methods strategy include for triangulation, development, initiation and expansion (Greenes et al., 1989). With a triangulation study design, different methods are used to explore a single phenomenon in order to validate research findings and to remove bias induced by individual research methods. In initiation, the first method is used to generate hypotheses or research questions, which are pursued with other research methods. In a development study design, research findings from the first method are used to develop subsequent research methods. Lastly, in an expansion study design, the understanding obtained from one method is expanded and elaborated through data analysis by other methods.

McEvoy and Richards (2006) classified three distinct views of mixed method practice namely purist, pragmatist, and anti conflationist views. A purist view tends to favour one research paradigm over the other and does not see any legitimate theoretical ground to combine the positivist and interpretivist paradigms underpinning quantitative and qualitative methods (Guba and Lincoln, 1989; Leiniger, 1994).

A pragmatist accepts the fundamental difference underpinning positivist and interpretivist paradigms, but does not have any hesitations in combining quantitative and qualitative methods for practical reasons (Tashakkori and Teddlie, 1998; Johnson and Onwuegbuzie, 2004), arguing combining both approaches can offset the relative limitations of each approach (Corner, 1991). A pragmatist would recognise the benefits offered by the flexibility to switch between research paradigms in data analysis when using a mixed methods strategy. However, the fundamental difference between the research paradigms, it is argued, makes it difficult to integrate and interpret data from a mixed methods approach (Perlesz and Lindsay, 2003; Bryman, 2004).

Anti-conflationists disagree that research methods, qualitative or quantitative methods, are conflated with research paradigms or theoretical positions (Robert, 2002; Bryman and Bell, 2003). The idea is that many quantitative and qualitative methods are neutral and should not be tied to a specific research paradigm, either positivist or interpretivist. Anti-conflationists refute the conservative division between quantitative and qualitative approaches, and suggest both research methods can be used and mixed within different philosophical positions. In contrast to pragmatists, anti-conflationists defend the importance of using a common ontological and epistemological framework when combining both quantitative and qualitative methods in research (Robert, 2002; McEvoy and Richards, 2006). Anti-conflationists are arguably still pragmatists; more precisely methodological pragmatists.

The traditional division between the positivist and interpretivist paradigms is seen as unnecessary in this era of pragmatism. Pragmatism as a philosophy of science is descended from the work of Charles Saunders Peirce (1839-1914), and was originally concerned with the philosophy of meaning. In Peirce's model, the meaning of a word or statement is closely linked to its practical and observed consequences. Hence, meaning is dynamic and collectively constructed to serve practice or actions.

In a pragmatist doctrine, beliefs about reality are also dynamic, social, empirical and practical (Ormerod, 2006). These beliefs are socially constructed through experience. Truth and knowledge are transient and subject to revision or dismissal when faced with new evidence or a better theory. Only the fittest surviving the test of time. Thus, research activities and theory building are supposed to support practice, and not to achieve authentic knowledge of reality, which is beyond reach. The division and paradigm wars between quantitative and qualitative approaches was counter-productive in terms of advancing research and theory (Schwandt, 2000).

In the philosophy of pragmatism, combining different types of inquiry methods is warranted for the sake of practical benefits. Alternative theoretical frameworks or paradigms can be devised in order to provide a common theoretical ground for the different research methods. Critical realism was a relatively new paradigm that was offered as an alternative to positivist and interpretivist traditions (Bhaskar, 1978, 1989). Critical realism can be used as the common theoretical framework of a mixed methods research study (McEvoy and Richards, 2006).

Critical realism confronts both positivism, or naive realism, and interpretivism. Critical realists reject the argument that reality is just a matter of idealism in the mind of the interpretivist. Critical realists argue the existence of a natural world that provides objective points of reference for our experiences. However, critical realists are not pure positivists or pure realists. Critical realists deny that the true nature of reality can be immediately accessed through empirical observations. Critical realism offers a comprehensive ontology of reality that consists of *"real", "actual"* and *"empirical"* reality (Bhaskar, 1978).

The nature of *"real"* reality is the deep structure and forces that have the potential to generate *"actual"* events, which can be partially observed or experienced. Bhaskar (1989) argued that it is impossible to have an understanding of the true nature and entities of the *"real"* domain as not all potentialities may be exercised

in *"actual"* events, or they may neutralise each other. However, the existence of *"real"* entities are not nullified by the absence of their effects on *"actual"* events. Moreover, not all aspects of *"real"* and *"actual"* entities are observable. Any *"empirical"* experiences are influenced by the a priori paradigm and human agency. Thus, it is impossible to assess the true nature of *"real"* and *"actual"* reality. Our knowledge about *"real"* and *"actual"* reality is speculative and dynamic, which may change in the light of new observations or paradigms.

In terms of epistemological position, critical realism distinguishes two types of knowledge objects, namely transitive and intransitive objects. Intransitive objects are things whose nature are independent of human agency, such as natural events and forces. In contrast, the nature of transitive objects depends on human agency. Languages and social structures can be seen as transitive objects. Traditionally, intransitive objects would be targets of natural science research, while transitive objects would be subjects of social science inquiry. In researching transitive objects, critical realists and interpretivists share the same view that understanding social phenomena is concept dependent and requires human agency for interpretation. However, critical realists often go further, exploring the underpinning social structures that constrain or support the occurrence of the phenomena (Williams, 2003). They may also be critical towards a research participant's interpretation of a phenomenon (Potter and Lopez, 2001).

A critical realist takes the view that a social phenomenon is multi-dimensional and results from the interaction of various social structures, mechanisms and human agency in a particular context (McEvoy and Richards, 2006). For this reason, a critical realist is often more interested to explicate causative mechanisms and their tendency to generate phenomena within a particular context, rather than to seek empirical generalisations (Lawson, 2003). Thus, research based on a theoretical framework of critical realism is often more interested in exploring an understanding of a phenomenon rather than in offering factual and/or descriptive knowledge. The paradigm is best associated with research that aims to identify

and describe the factors involved in complex social phenomena (Sandelowski and Barroso, 2002).

A critical realism paradigm was adopted as the theoretical framework underscoring the formulation of the research aim, objectives and methods for this study. The phenomenon under investigation is the current state of discharge summary systems. In line with a critical realism paradigm, this study explored the underlying structure and interactions, including hospital practice, regulations, and human agency involved, that influence the different aspects of discharge summaries. This understanding will contribute to identifying potential solutions to improve discharge summary systems.

On reflection, having a strong background in engineering and computer science training, I started this study from a positivist way of thinking about reality. It is through this study that I came to realise there are alternative ways to comprehend reality, and thus alternative modes of research inquiry. I have also come to a realisation of my empathy with pragmatism as a philosophy of science and my preference for critical realism as a way to understand the research enterprise.

My preference for critical realism has influenced the choice of research questions/objectives, methods and design of this study. My decision to use qualitative methods as part of the strategy, which involved subjective, but rationalised, interpretation, is a significant breakthrough from my previous security with a positivist position. The shift in research paradigm made me more comfortable to use qualitative methods as part of the mixed methods strategy employed in this study. The following section will present the details of the research design of this study.

3.3   Research design

The research aim and objectives of this study were presented in Chapter One, and their conception has been described in Chapter Two. This section explicates the design of this study to achieve the research aim and objectives. This study used mixed methods with a complementary study design (Bryman, 2001; Brannen, 2005; Jonson et al., 2007). The research objectives were considered to be best approached using a combination of different methods. The research design in Figure 3.1 shows the data collection and analysis methods used in this study, and where the results are presented in this thesis.

Each research participant took part in both the general interview and the simulation of completing a discharge summary. The simulation also included a follow up interview. All these activities were undertaken in a single session with each participant. The general interview was conducted in a semi-structured format in order to investigate current hospital practice associated with the completion of a discharge summary, and to identify the practice and other factors that contribute to the problems of poor data quality and delayed discharge summaries. The investigation focused on the practice of one local NHS Hospital Trust, and the research participants were recruited from the NHS Hospital Trust. This approach can be considered as an instrumental case study. As Stake (1994) described, a case study can be either intrinsic, instrumental or collective. A case study is intrinsic if the motive is to seek clarity and understand a particular case.
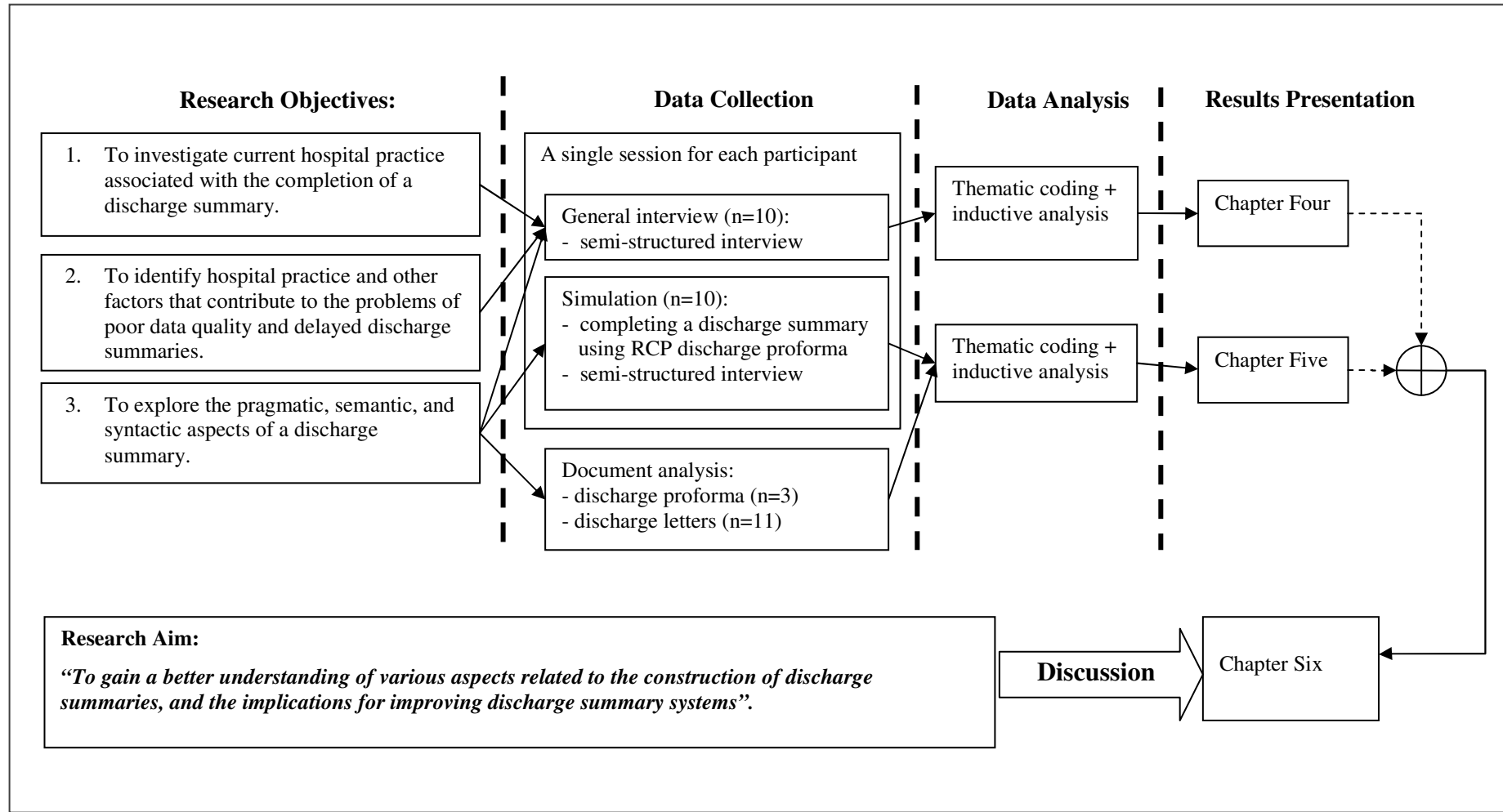
Figure 3.1 Research design

In contrast, an instrumental case study uses a particular case as the setting to investigate a research issue or topic. The collective case study uses multiple instrumental case studies to investigate the same phenomenon. In this study, the investigation of the practice in the case study NHS Hospital Trust was an instrumental case study to achieve the research objectives of this study. The informant interviews were audio recorded and transcribed. The data analysis involved thematic coding and inductive analysis (Johnson, 1998; Ryan and Bernard, 2003; Braun and Clarke, 2006). The results are presented in Chapter Four.

In order to explore the pragmatic, semantic and syntactic aspects of a discharge summary, this study employed a series of simulations of completing a discharge summary. The simulation exercise was directly followed by a semi-structured interview with the research participant. It was possible to use real patient discharge summaries from the hospital as the data collection method. However, this would require a lengthy process to anonymise patient data and to comply with the Data Protection Act regulations. This could have delayed the study considerably. For this reason, this study used the simulation approach, and each research participant was given an anonymised patient case, and was asked to complete a discharge summary using the RCP discharge proforma. The participants indicated they did not feel there was any significant difference between the simulation and the real life practice of completing discharge summaries, as illustrated in the following exchange:

> I: *What is the difference between the way you write the discharge*
> *summary in this simulation with what usually happens in the real?*
> R08:   *Well I think, well, this (process in the simulation) is how I would do it*
> *in real life.*
>
> (Registrar 08 in General Interview)

Hospital doctors often have to write the discharge summary for a patient who they did not know, and in this circumstance they rely on the patient's medical notes to write the discharge summary letter.

After the participant has completed the discharge summary, they were interviewed in order to capture the pragmatic and semantic aspects of the information contained in their discharge summary. The data from the simulations and the follow up interviews were coded thematically and were analysed inductively in order to explore the pragmatic and semantic aspects of the discharge summary. A number of discharge summary proformas (n=3) and discharge summary exemplars (n=11), which were collected during this study, were analysed to explicate their syntactic characteristics. The findings related to the pragmatic, semantic and syntactic aspects of discharge summary records are presented in Chapter Five.

Chapter Six integrates the findings in Chapter Four and Five in order to conclude the research aim of this study. This chapter discusses the key findings of this study, and demonstrated how these insights expand the current knowledge related to discharge summaries. The following section will present the execution of this study.

3.4   Data collection

The data collection involved undertaking a series of simulations and interviews with volunteer research participants. This data collection process consisted of five stages: preparing research instruments, securing ethical approval and site permission, piloting, sampling and undertaking the simulation and interviews with the volunteer research participants. Securing ethical approval and site permission is discussed separately (see Section 3.6 Research ethics). The remaining stages are explained in the next sections.

3.4.1 Preparing the research instrument

The research instruments were developed to assist the process of recruitment, simulation of completing a discharge summary and the interviews. Considerations

to research ethics were taken into account seriously in developing the instruments to recruit participants. This included ensuring informed consent was obtained prior to taking part in this study. These instruments included: a letter to the research participants (see Appendix 3), a research participant information sheet (see Appendix 4) and a research participant consent form (see Appendix 5).

The research instruments included the patient case notes used in the simulation and an interview guide or schedule (see Appendix 6). The patient case notes used for the simulation were drawn from the materials collected from the InContext project (InContext, 2008). The materials in the repository were also used as resources in the Penfield Virtual software; this software is used for problem based learning (PBL) teaching in the nursing curriculum (Ward and Hartley, 2006). Each patient case note consists of information such as admission notes, medical notes, nursing notes, histology test report, blood pressure chart, X-Ray images, pressure sore assessment, electrocardiogram chart, and medications charts. All this data had been digitalised and reformatted for legibility reasons, however the original information content was preserved. The permission and legality to use the patient case notes for this study was confirmed by the NHS Trust which acts as the gatekeeper of the original patient data (see Section 3.6 Research ethics).

Initially, patient case notes (n=12) from four specialities: general medicine, general surgery, paediatrics and physiotherapy were selected by a member of the InContext team; three typical cases from each speciality. However, only seven cases were used in this study, three from general medicine, three from general surgery, and one from physiotherapy. No participants were recruited from paediatrics specialties and only one physiotherapist participated. Originally, the study was intended to capture the practice difference between different specialities. However, this objective was unattainable given the difficulties and time constraint to recruit medical informants to participate voluntarily. Consequently, this study became focused on the investigation of the practice in medical and surgical specialities. These specialities seem to share many

similarities in terms of practice associated with patient discharge and the completion of a discharge summary. The data from the physiotherapist participant was used in this thesis only if it was not specific to physiotherapy speciality.

An interview schedule was developed to assist the interviewer during the interview process. It consisted of topics, themes and suggested questions. The interview schedule consisted of three parts and is presented in a schematic format (see Appendix 6). The first part included questions to inquire into the current hospital practice related to the completion of a discharge summary. The second part related to pragmatic and semantic aspects of the discharge summary created by the participant in the simulation. The generic *"why", "what"* and *"how"* probing was anticipated to elaborate any interesting or new issues spotted in a participant's response.

3.4.2 Piloting

Pilot studies are conducted for various reasons and purposes (Lancaster et al., 2004). However, not all authors are convinced of the benefit of a separate pilot study or testing in qualitative research (Holloway, 1997). The argument is that data collection in qualitative research is progressive; subsequent interviews and data collection can be gradually improved by incorporating insights obtained from previous interviews and data collection. The imperfection in the initial data collection can be tolerated and is seen as part of the normal data collection process. However, not undertaking pilot testing may raise ethical issues as sensitive issues in the interview conduct may not be identified before actual data collection. Additionally, a pilot testing is useful for testing the research instruments and preparing the researcher for the actual data collection.

In this study two pilot testing studies were undertaken to evaluate the data collection instruments and to anticipate the simulation and interview dynamics. The initial pilot testing was undertaken informally with one of the research

supervisors before submission for ethical approval. The simulation of completing a discharge summary and the follow up interview were administered in the same way proposed for the full study and the total time to complete was recorded (Peat et al., 2002). Unnecessary, difficult and ambiguous questions and procedures were discarded or replaced based on insights and evaluation from this pilot. The impact of the question sequence on the interview dynamic were evaluated, and changes to the interview guide structure was advised. No substantial ethical issues were identified from the interview questions or dynamics.

Following this, the research proposal and instruments were submitted to the School Research Ethics Committee (SREP) and then NHS Research Ethics Committee (REC) for ethical approval for this study. A separate governance application was made to the research and development department of the case study NHS Hospital Trust in order to secure the site permission for the data collection. A detailed description of the process is presented in Section 3.6 Research ethics.

After ethical approval for this study was granted, another pilot was undertaken with a member of staff of University of Huddersfield who met the sampling criteria of this study. There were no major issues identified and the structure of the interview guide was preserved for subsequent interviews. Prompts and probes were added to the interview guide as the results of insights obtained from this pilot. The pilot data provided a number of interesting insights from a GP perspective and this data was included in the data analysis.

3.4.3 Sampling

A definition of sampling is:

> *"the process of selecting units (e.g., people, organisations) from a population of interest so that by studying the sample we may fairly generalise our results back to the population from which they were chosen."*
>
> *(Trochim, 2006b, online)*

Sampling decisions are often influenced by research paradigm, objectives and available resources, including time, budget, constraint, access (Wilmot, 2005). Sampling approaches were often divided between probability and non-probability types. Probability sampling is often used in quantitative studies to obtain a sample that statically represent the target population in order to draw statically validated inferences. In contrast, qualitative research does not normally use statistics to validate an inference or conclusion. Indeed, one occurrence of a phenomenon in the sample was valid for analysis (Rithcie et al., 2003). Non-probability sampling is normally used in qualitative research (Wilmot, 2005).

This study used a purposive sampling, which is a type of non-probability sampling. A purposive sampling targets any subjects that meet specific inclusion criteria. When there are different groups targeted in the sample, the group size can be balanced during the sampling process (Black, 1999). In a purposive sampling, the participants are not chosen at random and the sampling criteria are more important than the sampling size (Wilmot, 2005).

The objective of this study was to investigate hospital practice related to patient discharge process and the completion of a discharge summary record. This objective was achieved through an instrumental case study based on the practice in the case study NHS Hospital Trust. Thus, the target population are hospital doctors who work in the case study NHS Hospital Trust. Furthermore, the participants were asked to undertake the simulation of completing a discharge summary record. Thus, the sampling criteria required the participants to have at least one year experience of completing discharge summaries in actual practice. Additionally, only potential participants from medicine, surgery, physiotherapy and paediatrics specialities were approached in order to match with the patient case notes that had been prepared.

Quantitative research often defines the sampling size based on statistical validation requirements, and a sample size of 30 is often the minimum number for statistical testing. In contrast, qualitative research often uses a small sample for several reasons. Firstly, the qualitative research is labour intensive, and analysing a large sample of qualitative data is often an unattainable objective (Wilmot, 2005). Secondly, qualitative research focuses on constructing meaning from data, not on a generalised hypothesis. Every deviation from general patterns in the data is of importance for inductive analysis in qualitative research, rather than the frequency of the occurrence (Crouch and McKenzie, 2006). However, there is a saturation point, where additional sampling will not generate any more or new information and values (Rithcie et al., 2003). The concept of saturation was proposed to decide the sample size in qualitative research (Glaser and Strauss, 1967; Mason, 2010).

Consequently, defining sampling size before the study commenced could be argued to be a premature decision. However, the NHS Research Ethics Committee require the estimated sampling size, along with the total time spent with participants, to be specified in the research proposal. This information is particularly important to judge how much resource the research will expend on the case study organisation, and twelve participants were initially targeted. During this study, 18 potential participants were approached and ten responded. After eight interview transcripts were analysed, no substantive new findings emerged from the data. Thus, the ten individuals that made up the sample in this study were deemed sufficient.

The low response rate (56%) was due to the route originally chosen to recruit participants. Initially, potential participants were identified through Directors of Medical and Surgical Departments in the case study NHS Hospital Trust. Email communication was used to contact the potential participants and provide an invitation letter (see Appendix 3) and information sheet (see Appendix 4). If they responded to the email and agreed to participate, an interview appointment was

made, and a simulation package containing patient case notes, an instruction sheet and RCP discharge summary proforma were handed to them prior the interview. If there was no response, a follow up email was sent to them twice at two weekly intervals. However, this strategy proved to be unfruitful and the response rate was low. Approximately ten potential participants were identified in this way yet only two participants responded. Moreover, it took a long time for them to respond, two to three months after the first contact. From the two participants who responded, it was evident that participants were unlikely to read the simulation package before the interview.

Four months into the data collection and having made little progress, an alternative strategy was employed. Once potential participants were identified, they were contacted directly by telephone or approached face to face. The information regarding the study was explained. In the face to face contacts, they were invited to read the information sheet themselves and if they agreed to participate, an interview appointment was made directly. The participants received the simulation package when attending the interview session. This strategy reduced the complexity and the length of the recruitment procedure.

In addition, a snowball approach (Black, 1999) was used in the recruitment process, where two of the respondents were asked about other potential participants. With this approach, potential participants who met the sample criteria and were willing to participate could be identified. This approach turned out to be productive and generated a high response level. Eight potential participants were approached in this way, and seven agreed to participate. The simulation and interviews were undertaken within two weeks of the first contact with the participants.

On reflection, the recruitment experience was instructive in revealing that a simple procedure and direct contact is more effective for recruiting *"busy"* hospital doctors, and also booking the interview appointment directly on first contact

reduces the risk of delays and cancellations. The hospital doctors were helpful when approached appropriately. However, complex and lengthy procedures, prolonged email communication and a passive approach were not productive.

When the participants attended the simulation and interview session, they were invited to read a consent form and ask questions if they wished to. The simulation and interview were undertaken if they agreed and signed the consent form. They then chose one patient case that suited their speciality and were asked to complete a discharge summary using the RCP discharge proforma. After the simulation, the participant was interviewed.

3.4.4 Interview and simulation

Interviews are used in research for a range of purposes, and each interview design may have different characteristics. According to Kvale (1996), the characteristics of a research interview include degree of structure, openness of purpose, exploration versus hypothesis testing, description versus interpretation, intellectual versus emotional orientation. In this study, a semi-structured approach was adopted. This was characterised by the flexibility to change the sequence and format of the questions being asked in order to adjust to interviewee's response. The interview schedule, consisted of a set of topics, questions and probes, and this was used to guide rather than to dictate the interview with the participant. In this study, the participants were fully informed about the purpose of the interview; this is essential to ground a mutual understanding about what is to be expected from the interview.

Managing the interview dynamic appropriately is critical for interview success (Kvale, 1996). Clear interview objectives are essential. It is also a matter of skill to handle the dynamics and the ever changing situation of the interview. Equally important, the interviewer needs to have some idea about how the interview data is going to be analysed and written up. Without any preparations, the interviewer

may fail to follow up important information in the interview. In this study, straightforward questions were asked first to make the participant feel relaxed. Participants were encouraged to feel free to respond to questions without interruption. Any queries or additional questions were noted by the interviewer and then asked when a natural break in the conversation occurred. A good interview dynamic gives satisfaction to both the interviewer and interviewee (Griffin, 2005). The interviews undertaken during this study were a good experience for the author to gain skill in managing the interview dynamics. The simulation and the interview together took between 45 minutes to one hour, this already included the general and simulation interview. With the participants' consent, the interviews were audio recorded. The demographic data of the participants (n=10) is shown in Table 3.2.

Table 3.2 The demographic data of the research participants

Participant ID	Years of experience as a doctor	Gender	Grade	Patient case used in the simulation	Participant's Speciality
General Practitioner 01	36	Male	GP	Surgery 1 (abdo pain)	GP
Consultant 02	30	Male	Consultant	Surgery 1 (abdo pain)	General Surgery
Physiotherapist 03	7	Female	ST>3	Physio 1 (left lumbago)	Physiotherapy
Registrar 04	8	Female	SpR	Medical 1 (chest pain)	Elderly Medicine
Registrar 05	8	Female	SpR	Medical 2 (stroke)	Alternative Medicine
Registrar 06	8	Female	ST>3	Medical 3 (polymotorneuropathy)	Elderly Medicine
Registrar 07	6	Male	ST>3	Medical 1 (chest pain)	Respiratory Medicine
Registrar 08	8	Male	ST>3	Surgery 2 (open cholecystectomy)	General Surgery
Registrar 09	7	Female	SpR	Medical 1 (chest pain)	endocrinology medicine
Consultant 10	20	Male	Consultant	Surgery 3 (by pass surgery)	General Surgery

(GP= General Practitioner, ST=Speciality Training, SpR= Specialist Registrar)

3.5 Data analysis

In order to analyse data from the simulations and interviews, the interview audio records were first transcribed, checked for accuracy and anonymised. Then, the data was entered into qualitative analysis software Nvivo version 8[3]. Similarly, the discharge summary letters produced from the simulation were scanned and entered into the software; the software supports coding for textual and visual elements. The data was initially analysed or coded thematically (Ryan and Bernard, 2003; Braun and Clarke, 2006).

The thematic coding was the first stage of the data analysis. Data analysis is essentially composed of analytic coding and data interpretation. Coding supports data analysis in a number ways. Firstly, coding helps the researcher to organise and retrieve research data. During a coding process, data is broken into chunks and segments and assigned with meaningful labels. These labels or codes may serve as indexes for retrieving, grouping and reviewing the data (Miles and Huberman, 1994). Quantitative methods such as content analysis use coding in this way; the coding assigns the same code to words of similar meaning to allow counting of their frequency of occurrence in the text for a descriptive analysis. Secondly, coding is essentially used as an analytical procedure in qualitative research (Strauss, 1987). Coffey and Atkinson described the coding as a heuristic tool to analyse data:

> *"Coding should be thought of as essentially heuristic, providing ways of interacting with and thinking about the data. Those processes of reflection are more important ultimately than the precise procedures and representations that are employed."*

> *(Coffey and Atkinson, 1996, p. 30)*

This statement implies that analytic coding is not a mechanical procedure but a creative process. The researcher's analytical frame influences the coding process. Coding is an heuristic tool for discovery from the data (Seidel and Kelle, 1995).

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[3] Website url: http://www.qsrinternational.com/

Analytic coding is used to re-orientate (Strauss, 1987), re-contextualise (Tesch, 1990) and re-conceptualise (Coffey and Atkinson, 1996) empirical data. Each code represents a concept. A segment of data is associated with a concept and the linkage between concepts is established based on the relationship and pattern in the data. Coffey and Atkinson (1996) argued that the coding process essentially de-composes the empirical data and re-composes them within the new conceptual context. The contextualisation opens up further questions and analytical possibilities for the data. The concepts used to re-orientate or re-contextualise the data can be derived from the interactions with data, literature, research questions or the researcher's ideas. From the experience in this study, the conceptualisation process was dynamic and tended to change throughout the course of the research; and the conceptualisation contributed to the researcher's interpretation when undertaking the coding and data analysis.

The characteristics of a coding process are sometimes associated exclusively with a particular research method or data analysis. For example, Grounded Theory Method (Glaser and Strauss, 1967; Strauss, 1987; Strauss and Corbin, 1990) is characterised by a coding process that starts without a preconceived coding frame. The coded structure is constructed through the interaction with the data. Alternatively, a researcher may start with some code structure or frame which is gradually refined throughout the coding process; this coding style is referred to as template analysis (King, 1998). Data analysis whose coding process focuses on identifying general concepts, patterns or themes from the data is often called thematic analysis (Ryan and Bernard, 2003; Braun and Clarke, 2006). This study used a thematic analysis approach.

Initially, the coding process used a free coding technique. In this stage, no preconceived coding structure was imposed. After coding three interview transcripts, hundreds of codes emerged. These codes were then organised into a structure based on the research questions, the major themes and the conceptual frames (pragmatic, semantic, syntactic aspects) adopted for this study. The coding

structure was continuously revised as the remaining interview transcripts were
coded. The revision included reorganising the code structure, moving codes
around the structures, collapsing multiple codes into single codes, and dividing a
code into multiple codes. In order to maintain simplicity of the code structure, the
coding was limited to three levels of depth and the number of the top headings
was limited to fifteen. From the experience of doing the coding, a long list of
headings tended to slow down the coding process significantly. A fragment of the
coding structure for this study is shown in Figure 3.2.
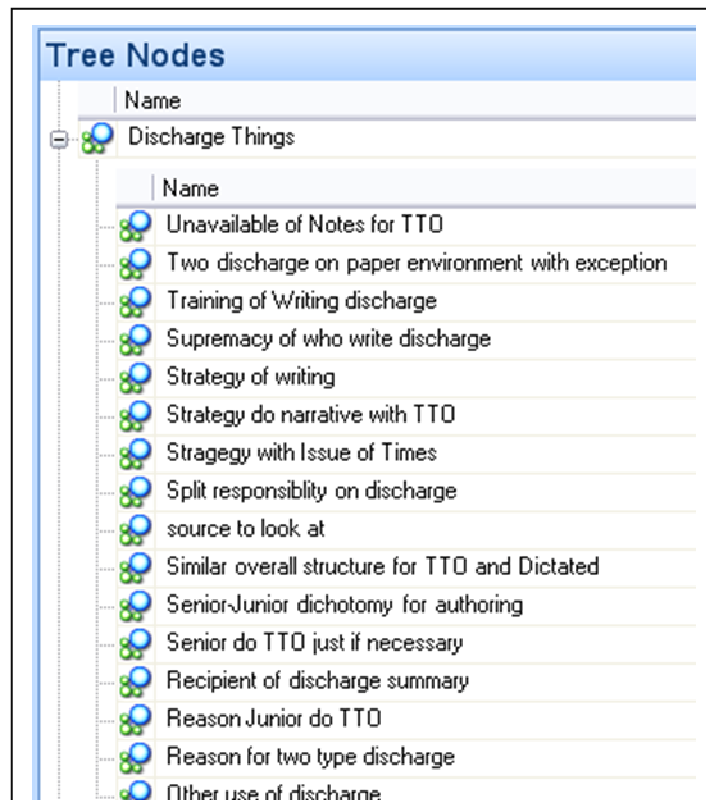
Figure 3.2 Fragment of the coding structure

The analytic coding was the first element of the data analysis. The second element
was the reinterpretation of data based on the analytic coding. As the conceptual
space was developed during the coding process, the data was continuously
reinterpreted in the new conceptual context. This process involved inductive
analysis (Johnson, 1998; Katz, 2001; Lathlean, 2006) in order to establish the

causative links across the identified themes or concepts so as to construct an explanation in relation to the research questions and objectives. Analytic induction was defined as:

> *"a process of analysing data where the researcher tries to find explanations by carrying on with the data collection until no cases are found that are inconsistent with a hypothetical explanation of a phenomenon"*

> *(Lathlean, 2006, p. 421)*

The focus of the interpretation is to create an analytic narrative that was based on the data and to develop arguments in relation to the research questions or objectives (Braun and Clarke, 2006), this goes beyond the descriptive account of the data in its original context.

This process continued into the writing-up stage. In the writing-up stage, the causative or explanatory links across different themes were presented in a sequential fashion. However, the writing-up process itself was not void from analytic induction. Consequently, during the writing-up process, the findings and data were still continuously reinterpreted. This process continued until the interpretation was stable, valid and coherent with the data according to the author's perspective. Additionally, segments of data can be used to support the argument or for illustration in this thesis. Direct quotations from informants were used extensively in Chapters Four and Five. If the data were taken from the general interviews, they were indicated as *"General Interview"* in the quotation source. Similarly, the data taken from the discharge summaries created by the research participants were indicated as *"Simulated Discharge Letter"*, and the quotations taken from the simulation's follow up interviews were indicated as *"Simulation Interview"*.

The same coding software was used to organise quotations that are potentially to be incorporated in this thesis. These quotations can be organised according to the writing-up structure, as is the case with this thesis, as shown Figure 3.3.
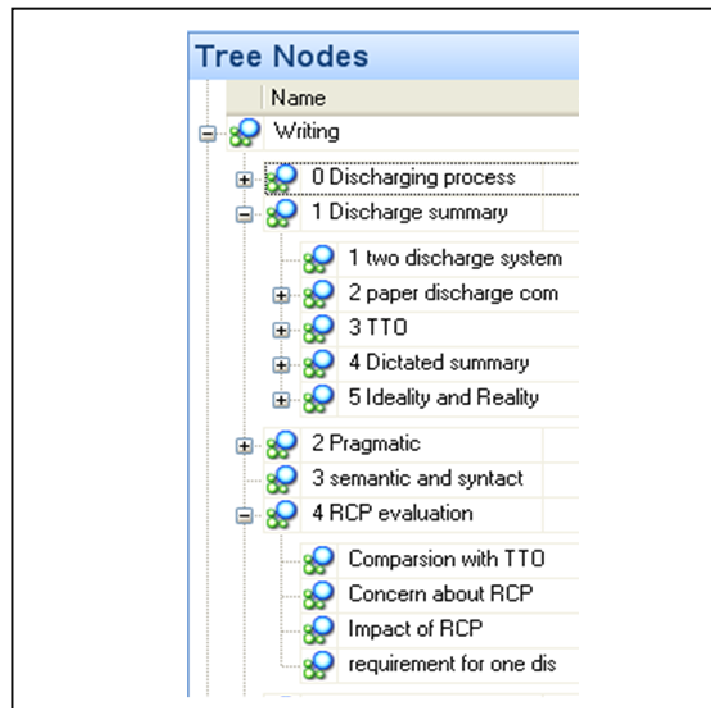
Figure 3.3 Coding structure to support the writing-up in this thesis

3.6 Research ethics

In recent years, there has been a greater emphasis on research ethics or conduct across the research community. This is partly due to legislative developments in human rights and data protection and the increased awareness of ethical accountability of any activities involving human agency (Social Research Association, 2003). Underpinning ethical principles in research is respect for human dignity and the need to protect an individual's physical, psychological or cultural integrity and interest (Canterbury Christ Church University, 2006)

Social research studies are increasingly subjected to ethical review processes. In many organisations, a research governance system has been introduced to assure the accountable and ethical conduct behaviour of research activities undertaken within the organisation. Funders and organisations are increasingly expecting that a research proposal undergoes a rigorous ethics review process as a requirement to

grant fund or access to prospective participants (Social Research Association, 2003). Many universities now have their own Ethics Committee to review research proposals in order to assess and identify ethical issues and/or requirements associated with the research design. The acceleration of this phenomenon is partly due to the implementation of the research ethics framework developed by the Economic and Social Research Council (ESRC) UK (2010), which was originally published in 2005. Within this framework, a research ethics evaluation is intended to protect all groups involved including researchers, funder, participants and the institution. Ethical evaluation is concerned with the whole research process including design, execution and dissemination of research studies.

Ethical considerations are particularly applicable to the part of this study which is related to the recruitment of informants to take part in interviews and simulations of completing a discharge summary. This section explicates the ethical considerations in the research design, execution and dissemination of this study to comply with the ESRC research ethics framework (2010), as part of securing the NHS ethical approval for this study. The ESRC framework lays out key principles for research ethics evaluation, which will be described in the following sections.

3.6.1 Integrity, quality and transparency

Research design and execution should demonstrate certain characteristics including integrity, quality and transparency. There should be a review and monitoring system in place to evaluate the research proposal and its execution (Economy and Social Research Council, 2010). The ESRC framework (2010) stated that the ethical conduct of research is the responsibility of the principal investigator and research organisation. The research organisation is expected to have a system for ethics review, approval and governance for the research undertaken. In the context of this study, this role was undertaken by the School Research Ethics Panel (SREP). The requirement for integrity, quality and

transparency criteria means that the research design should be described clearly in the research proposal submitted to SREP. The benefits and cost/risks associated with the research should be justified. Moreover, any potential ethical issues must be identified and addressed satisfactorily in the research design.

The instruments that were used to recruit and to facilitate interview and simulation with participants were also submitted with the research proposal. These included an invitation to prospective participants (see Appendix 3), a research participant information sheet (see Appendix 4), a research participant consent form (see Appendix 5), an interview guide (see Appendix 6), the RCP discharge summary proforma (see Appendix 2), and copy of RCP approved headings & definitions (see Appendix 1). The information sheet explained the purpose of this study and what was expected from the research participants by taking part.

The research proposal was reviewed and approved by SREP with a requirement to seek ethical approval from a NHS Research Ethics Committee (REC). Undertaking a research study involving clinical records and/or NHS patients or staff required at that time research ethics review and approval (Department of Health, 2005). Moreover, the NHS REC approval was required to get permission to access participants from the NHS Hospital Trust where the data was collected. An online application, the Integrated Research Application System (2009), was used as a single data entry system to generate both the NHS REC approval and NHS Hospital Trust permission applications. The submission was followed up by a face to face interview session in front of an NHS Local Research Ethics Committee (LREC). The research was approved by the NHS LREC with a minor revision to the participant consent form in order to allow the NHS Hospital Trust to scrutinise the data collected if they wish to do so.

In retrospect, the experience of going through the research ethics review and monitoring has developed my awareness and appreciation of ethical issues in undertaking a research study. Nevertheless, the preparation for and process of

research ethics had taken a considerable proportion of the time of this study. Given that the complexity of the system, the learning curve was steep. It required considerable consultation time with my academic supervisor, SREP members and NHS REC online resources to ensure everything important for the review had been covered satisfactorily.

3.6.2 Voluntary participation and informed consent

The involvement of research participants must be voluntary and free from any coercion (Economy and Social Research Council, 2010). Underpinning these principles is respect for the individual's autonomy and self determination (Canterbury Christ Church University, 2006). This principle is partly achieved through informed consent (Trochim, 2006a). Research participants need to be sufficiently informed about the study and its conduct before giving their consent (Lipson, 1994). All important information regarding this study was included on the information sheet (see Appendix 4), and participants were asked to take time to read the information sheet and consent form before signing. Information provided to them included the purpose of the study and their contribution in taking part. The participants read them at a different stage depending on the recruitment approach used. Using the email contact approach, the information sheet was attached to the invitation letter sent to them. Using the telephone contact, all information related to this study was shared verbally and interactively. They were asked to read the information sheet when attending the interview, before reading and signing the consent form (see Appendix 5).

Informed consent from research participants does not automatically guarantee ethical conduct in the recruitment. Informed consent is valid only if it is given voluntarily (Grant and Sugarman, 2004). In this study, participation was voluntary. Participants could withdraw anytime without any reasons and this would not incur any penalties. The ethical conduct of this study was explained, including the assurance of their anonymity and the confidentiality of their

information. Travel reimbursement was offered to prevent a financial disadvantage in their taking part. They were informed that the interview would be audio-recorded and later transcribed, and that the researcher's supervisors may be given access to their information for data analysis purposes.

The consent form was provided in a check list format so that research participants were stimulated to read it carefully and fully understand the purpose and their contribution to the study, their rights and obligations, and the consequences of their decision to take part. In addition, an attempt was made to seek consent from the NHS Hospital Trust that acts as custodian of the original data. The NHS Hospital Trust confirmed in writing the legitimate use of the data in this research study.

3.6.3 Confidentiality and anonymity

Research participants need to be protected from any harm caused by a disclosure of their information (Economy and Social Research Council, 2010). The required interventions includes anonymising their identity from the data and proper handling of confidential data including data storage, retention and disposal.

3.6.3.1 Anonymity

The interview audio records were transferred immediately to a personal folder in the university computer network and the original record in the recording device was deleted immediately. The participant identities are anonymised by assigning number codes from one to ten. For example, the identities in interview transcripts were replaced by labels P01 to P10 before data analysis. The case study NHS Hospital Trust identity was also anonymised. The audio records and transcript files were named according to the participant's code number. A separate password protected file was used to store participants' demographic information and their code numbers. When used in this thesis, quotes from participants were identified

by their medical grades and code numbers. The association between the quotes and the participant medical roles/grades was of significant importance to this study.

3.6.3.2 Storage

Audio records, transcripts and the participant demographic files were stored in the investigator's personal password protected folder in the University computer network. The folder was only accessible using the investigator's logon credentials. In order to ensure security of the data, the audio records and participant demographic files were further encrypted and protected by a password known only to the investigator. All files were backed up onto a USB disk that was kept securely.

Confidential paper records, e.g. consent form and ethical approval and permission letters to conduct this study, were stored in the investigator's filing cabinet in the office room in the university and the cabinet was locked; only the investigator has access.

3.6.3.3 Retention and disposal

On completion of this study, audio records and patient demographic files were destroyed. Copies of anonymised transcript files will be submitted to the University of Huddersfield's repository and will be retained and disposed of according to the University's record keeping policy. The principal investigator will retain copies of anonymised transcript files and participants' consent forms for three years following the study completion. This action is taken as a precaution should there be a complaint or an audit evaluation regarding the study. Afterwards, the transcript files will be destroyed and participants' consent forms will be shredded.

3.6.4 Avoid potential harm to participants

Any researcher must strive to avoid any potential harm to research participants (Economy and Social Research Council, 2010). Potential harm to participants can be physical, financial, psychological or social (Richards and Schwartz, 2002; Fouka and Mantzorou, 2011). Participants can be financially disadvantaged through personal expense, e.g travel cost, to take part. They can be harmed psychologically through anxiety and distress caused by the interview process. A breach of confidentiality and privacy of research data and publications may cause social embarrassment and harm to the reputation of participants (Richards and Schwartz, 2002).

In order to minimise potential harm to participants, an informed consent procedure was used in the recruitment process and follow up was stopped after a prospective participant failed to respond after three contact attempts. Moreover, the conduct and questions being asked during interviews were carefully assessed by the researcher and the members of the supervisory team to ensure that there was no threat to participants' rights, dignity and privacy. A pilot interview with one of the supervisors and another pilot interview with a research participant were undertaken to minimise potential harm to participants during the interviews. The measures to protect participants' identity and confidentiality has been explained earlier.

In order to avoid any potential financial harms to participants, they were informed that they could ask for a travel reimbursement if their taking part would incur travel cost. No participants claimed travel reimbursement as the interviews took place in their work place or they did not travel exclusively for the interview.

3.6.5 Autonomy of the researcher

Ideally, a researcher should not have a conflict of interest in undertaking a research project. However, sometimes this position is unavoidable. If this is the case, the investigator has ethical and legal obligations to declare his/her conflict of interest to research participants (Resnik, 2004). However, there was no conflict of interest identified in this study.

3.7 Research rigour

Research activities can be seen as communication of science and knowledge. In this communication, claims are made and judged (Porter, 2007). Presently, there is no unified evaluation framework about how research should be judged. Quantitative research, which predominantly adopts a positivism paradigm, uses validity and reliability criteria to appraise research in term of accuracy and consistency in representing *"objective truth"* or *"reality"*. Validity is about the extent to which the research account represents the phenomena to which it refers, while reliability is about the consistency to replicate the same research outcome (Hammersley, 1990; Bryman, 2008). Research validity can be judged in terms of internal validity and external validity. The former is related to the accuracy of the acquired data to represent the phenomena or variables of interest, while the latter is related to the extent the research findings can be generalised beyond the scope of the context and sample of the research (Topping, 2006). Internal reliability is related to the extent external researcher would come to the same conclusions on reanalysing the data. External reliability is related to the extent external researcher can replicate the original study and come to the same conclusions (Lecompte and Goetz, 1982). These criteria are normally estimated using statistics parameters, e.g covariance.

In research that uses qualitative data, which includes mixed methods research designs such as that used in this study, there are a range of views concerning the basis for research appraisal. Hope and Waterman (2003) classify three distinct positions with regard to the qualitative research appraisal: use the same validity and reliability criteria; use separate criteria for qualitative measure; or reject all predetermined criteria.

Long and Jonson (2000) argued that validity and reliability criteria should be used in quantitative and qualitative research alike. However, the absence of a toolkit such as statistics in qualitative research means that proponents of this view will need to define how these criteria should be satisfied in qualitative research. Other authors have suggested that research rigour can be achieved through incremental and interactive verification throughout the research process. Verification strategies include ensuring methodological coherence and sampling sufficiency, and establishing a dynamic relationship between sampling, data collection and analysis, thinking theoretically, and theory development (Morse et al., 2002).

Another competing position takes the view that validity and reliability criteria aspire toward objective reality and truth. This makes them unsuitable to be used to appraise qualitative research, which often accepts multiple views of reality and truth. Within this position are those seeking to establish alternative evaluation criteria. One widely accepted evaluation framework uses the concept of trustworthiness, which consists of criteria such as credibility, transferability, dependability and confirmability (Lincoln and Guba, 1985). The credibility is about the faithful representation to participant view, which is a preferred criterion to internal validity. Transferability is preferred to external validity. Dependability is favoured over reliability, and confirmability over objectivity. Shenton (2004) proposed a number of strategies to bolster confidence in these criteria, as shown in Table 3.3. In order to show the rigour of this study according to these criteria, the table also shows the strategies that were used in this study. On a later work, Guba and Lincoln (1989) introduced authenticity criteria. The practice of showing

interview snippets in the research report is one way to demonstrate authenticity in qualitative research (Topping, 2006). This strategy is used to present the findings of this study in Chapters Four and Five.

Table 3.3 Strategies to achieve rigour criteria in qualitative research

Criteria	Strategies to demonstrate the rigour	Use ?
Credibility (internal validity)	Adoption of appropriate, well recognised research methods	Yes
	Development of early familiarity with culture of participating organisations	-
	Random sampling of individuals serving as informants	-
	Triangulation via use of different methods, different types of informants and different sites	Yes
	Tactics to help ensure honesty in informants	Yes
	Iterative questioning in data collection dialogues	Yes
	Negative case analysis	Yes
	Debriefing sessions between researcher and superiors	Yes
	Peer scrutiny of project	-
	Use of "reflective commentary"	Yes
	Description of background, qualifications and experience of the researcher	Yes
	Member checks of data collected and interpretations/theories formed	-
	Thick description of phenomenon under scrutiny	Yes
	Examination of previous research to frame findings	Yes
Transferability (external validity)	Provision of background data to establish context of study and detailed description of phenomenon in question to allow comparisons to be made	Yes
Dependability (reliability)	Employment of "overlapping methods"	
	In depth methodological description to allow study to be repeated	Yes
Confirmability (objectivity)	Triangulation to reduce effect of investigator bias	
	Admission of researcher's beliefs and assumptions	Yes
	Recognition of shortcomings in study's methods and their potential effects	Yes
	In depth methodological description to allow integrity of research results to be Scrutinized	Yes
	Use of diagrams to demonstrate "audit trail"	-

Source: Shenton (2004)

However, not all those criteria and strategies would be readily accepted by other authors. For example, Sandelowski and Barroso (2002) argued that the suggestion of peer reviews and member/respondent checks was influenced by positivism thinking. This strategy is unnecessary in qualitative research, which embraces *"multiple"* and *"constructed"* views of reality.

All criteria discussed so far are related to the rigour of generation of knowledge from data through a research process. Other authors included non epistemic rigour criteria such as ethics and accessibility, e.g. quality of presentation, as part of their evaluation framework (Pawson et al., 2003). This shows that research appraisal may encompass the aspects of aesthetic, ethics and epistemics. The adherence to ethical principles in the conduct of this research is reported in the previous section. This demonstrates that this study is designed and executed rigorously in order to respect participants and their confidentiality. The aesthetic aspects of this thesis should also be appreciated even though it may not be perfect. Attempts have been made to adhere to the rigour of academic writing in terms of structure, language and style to ease access to this study.

The main problem with all qualitative rigour criteria is the difficulties of judging whether research has reached the standard criteria (Hope and Waterman, 2003). Thus, research appraisal is subjective (Rolfe, 2006). Based on this premise, Rolfe suggested that the research appraisal should be left to a research expert reader rather than a researcher or a set of predetermined criteria. The researcher is only responsible for leaving an audit trail of the research process in the report to allow evaluation. Implicitly, the author suggested that transparency is the minimal requirement that must be demonstrated by a researcher in their reporting. This is not surprising, considering that any good communication should establish transparency. The transparency of this research study was demonstrated through the reporting of the process of the study from the conception to completion. The dynamics of the research process was also described through the investigator's reflection.

Rolfe's argument was opposed strongly by Porter (2007), who argued that the research appraisal should be two sided. Thus, the subjectivity of the research appraisal does not void the researcher's responsibility to demonstrate the rigour of the research conduct even though it is up to reader to ascertain that the researcher has done so. Thus, while I have demonstrated the rigour of the conduct of this

study in terms of transparency, aesthetic, ethical and epistemic criteria, I make no claim of reaching those standards. Instead, the appraisal of this research is always open to criticism and to negotiation with its audience. The following chapter presents the first part of the research findings. The chapter will explicate the hospital practice related to patient discharge process and the completion of discharge summaries, and how they influence the delivery and data quality of a discharge summary record.

3.8 Summary

The subscription to the critical realism paradigm has influenced the formulation of the research aim, objectives and the research methods of this study. In the critical realism perspective, a real world phenomena is seen as the result of complex interactions between different factors. This perspective has motivated this study to explicate the complex relationships between different factors that influence the current state of discharge summary systems. A mixed methods strategy was used to achieve the research objectives of this study. The understanding of the complexity is expected to bring insights of potential solutions to improve discharge summary systems. This chapter has also presented the research design and the execution of this study, along with the considerations to the research ethics and the research rigour. The next chapters will explicate the findings of this study.

CHAPTER 4 DISCHARGE SUMMARIES WITHIN THE CONTEXT OF HOSPITAL PRACTICE

4.1 Introduction

This chapter presents results from the first stage of this project, which aimed to understand the hospital practice associated with discharge summaries. This investigation was expected to provide a better understanding of the underlying factors in current hospital practice that contribute to the problems of poor data quality and delayed discharge summaries. The terms *"discharge summary"*, *"discharge summary letter"*, *"discharge report"* and *"discharge summary record"* are used interchangeably in this thesis. However, in some contexts, one term may be preferred to others. For example, NPfIT implementation normally uses *"discharge report"* to denote an electronic discharge summary. External references and informant's quotes may use terms that have subtle difference to these terms such as *"discharge letter"*.

The first section presents the process of patient discharge from hospital in order to illustrate the broader context of practice associated with discharge summary records. The following section presents the current practice of completing discharge summaries in the case study NHS Hospital Trust. The final section discusses the hospital practice and other factors that contribute to the problems of poor data quality and delayed discharge summaries.

4.2 Patient discharge process

The overarching purpose of the patient discharge process is to assist the transfer of responsibility for the patient's care from hospital to primary care providers. The transfer becomes more complex if the patient has multiple and/or complex care needs. Current healthcare systems operate on a speciality basis, and care interventions are normally managed using a multidisciplinary team approach. For example, if a patient is admitted to a hospital following a Cerebral Vascular Accident (CVA), she/he will require supportive care for the impairment to their physical and cognitive communication functions which impacts on their ability to

undertake daily activities independently. The multidisciplinary team including physiotherapists may provide that supportive care.

When a patient is discharged from hospital, they may still require ongoing care support. Ideally, the need for this support is assessed as soon as the patient is admitted to hospital. The nurse member of the team will normally assess the potential needs for ongoing care support from available sources such as family members. On patient discharge, the hospital care team will then transmit this information to the patient's GP, district nurses, and other community health professionals as appropriate.

In primary care, GPs are the main health professionals who are responsible for coordinating and managing health services to patients. They liaise with other primary care health professionals in order to provide specific care support for patients. District nurses are responsible for coordinating and managing the ongoing nursing care support for a patient, after she/he is discharged from hospital. This would normally include scheduling a district nurse or other member of the nursing team to visit the patient in their home, which could be in a nursing or residential home. A patient is normally discharged to a nursing home only if they require intensive nursing care. Social care services may provide additional supportive care for a patient who cannot cope with their daily activities, or who has limited or no support at home. Additionally, other community health professionals may get involved in order to make sure patients get the necessary support to improve their ability to live independently. One of the informants describes the complexity of a patient discharge:

> *"Usually the nursing staff, if the patient is coming from their own home, if the patient lives alone, then they will find out from the family member. You know, is the patient coping well at home by themselves and then they find the information from the family. And the family might say oh my mum is not coping at home, we can't help her, we live far away, blah, blah, blah, we're busy and in that case its like that patient is not safe to go home and living by herself. So we need to arrange some carers for her, whether the patient is still suitable to go home with carer support, or if the patient needs, for example, a patient is very demented and they don't know what they're doing, so you won't have a 24 hour carer, its quite difficult to have a 24 hour carer at home, so in that case that patient might*

*need to go to a residential home and things like that. And if the patient needs a
lot of nursing support while the patient is in hospital, then the patient, the carer
can't give 24 hour care at home situation and likely the carer can't give the
nursing care to the patient and likely that patient can go to nursing home. So the
nursing staff, they can discuss with the family member what the care they need
and then they think about which one is suitable for the patient and then if the
patient needs residential home or nursing home or social care, then they will
liaise with the social worker and the social worker will get involved and sort out
everything."*

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(Registrar 09 in General Interview)

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The patient discharge process is a multidisciplinary activity (Vost and Siddorn, 2010). The hospital care team must initiate and agree the transfer of responsibility to support the patient's ongoing care before the actual discharge takes place. The hospital doctor and nurse would normally share this responsibility – the discharging doctor would normally write a discharge summary letter to the patient's GP to notify the transfer of responsibility for supporting the patient's medical care needs and the discharging nurse would normally manage the transfer of responsibility for other support care for the patient. A consultant, based on medical considerations, will authorise the patient discharge and the discharge nurse will give a *"green light"* after she/he sorts out all the necessary preparation and checks:

> *"Well obviously its needs to be authorised by the consultant. The consultant has
> to be happy for the discharge [...] from the medical point of view if we feel that
> the patient is fit for discharge, then the nursing staff work out whether the patient
> needs the home situation, especially for the elderly patients. So if they are
> struggling at home with no carers and things like that, then the patient is not safe
> to go home, although the patient is medically fit for discharge."*

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(Registrar 09 in General Interview)

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The discharging nurse is responsible for making sure that all support care is in place before the actual discharge takes place. Poor discharge planning is perceived to bring the risk of unplanned readmission:

> *"We can't discharge the patient unless all this is sorted out, otherwise the
> patient will not be safe and then we, once we let them go home and they might
> have a problem, they come back to the hospital, so to prevent another hospital
> admission."*

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(Registrar 09 in General Interview)

</div>

The multidisciplinary approach to the patient's care during the hospitalisation affects how clinical information related to the patient's care is recorded. Hospital nurses would normally record the information related to nursing care in records separate from the medical notes written by doctors. If allied health professionals, e.g. physiotherapists or occupational therapists, are involved, their notes may or may again not form part of the medical notes depending on the local hospital policy. If notes from non-medical members of the Multi Disciplinary Team (MDT) are not kept as a part of the medical notes, they can be missed by doctors when completing discharge summaries, partly because they use the medical notes as their source of information:

> *"Yeah, yeah, we document on our medical records and there is also separate nursing record as well, they write down as well, and sometimes, it depends on hospital to hospital, this hospital, the occupational therapists, physiotherapists, they also write down what's their suggestion on the medical notes, so when we do the ward round, then we'll know oh that patient been seen by occupational therapy, suggest so and so, and then we have to facilitate from the nursing staff and things like that. It depends on hospitals. Some of the hospitals, they've got the separate physiotherapists section which is usually missed by our medical people, because we concentrate on our medical notes only and unless you know that you have it in your hospital, you have a separate physiotherapy, occupational therapist's notes and then unless you know that and you go and find out from their entry, other section. Most of the junior doctors who are new to this hospital, they don't know, they just concentrate on the medical notes section only, so it will get missed."*

> *(Registrar 09 in General Interview)*

As described by the informant Registrar 09, discharge summaries completed by doctors tend to focus on medical aspects of a patient's episode of care. A similar account was also offered by the Consultant 02:

> *"Well I don't tend to use the nursing notes [...] I didn't actually look at the nursing notes. I mean they are relevant to that, basically when a patient is discharged all the sort of support services are put in place by the nurses and occupational therapy, the physiotherapy and all the rest of it and all the nursing support at home, they deal with that, yeah, and it basically, the patient goes home, to a nursing home or to rehabilitation or whatever, that's done through the nursing, the nurses already organise that. But I don't tend put all that in my discharge summary."*

> *(Consultant 02 in General Interview)*

In this account the informant showed awareness of the need to provide information in order to transfer information about the patient's ongoing care needs. However, the autonomy of the health professionals means that the different aspects of the patient's package of care are not necessarily a part of medical discharge summaries. As the following account describes, a parallel communication process between different hospital and primary care health professionals occurs to organise support care for the patient:

> *"The nursing staff are looking to the social side of things, what care the patient will need in the community, and then they mobilise that care depending on where the patient goes to. So the consequences of discharge are catered for because the nurses have already organised, you know, the home help to come in three times a day or whatever it is, or the district nurse to visit, or whatever, you know."*
>
> *(Consultant 02 in General Interview)*

In addition, there was a view that that the GP would not necessarily be interested in the nursing care support, that would become the responsibility of district nurses after a patient is discharged from hospital. Information given to the patient by the nursing staff regarding nursing care was not necessarily part of the discharge summary written by the hospital doctor:

> *"Yeah really, you see, these things we're not going to give to, this is the discharge summary for the GP usually, not for the patient, although we are increasingly copying patients into discharge summaries and things, so I suppose we are going to look at it in that way and lots of the information that's been given are given by the nursing staff in term of your wound care, you need to change your dressing this time or you need to take your bandages off then and the district nurse will come and see you in two days. So that's given by the nurses, we don't really record that on our discharge summary. I don't think the GP will be interested in that anyway."*
>
> *(Consultant 10 in General Interview)*

While it is true that doctors tend to focus on medical aspects of the patient's care in completing discharge summaries, in specialities such as elderly medicine, non-medical issues can be relevant and therefore are included in the discharge summaries:

> *"We tend to stick more to the medical side unless there's something else that's more relevant, it usually takes a medical person to understand the medical*

problems and not, its not like the holistic thing, obviously certain, it depends on the speciality you're working in, it becomes more relevant, especially in care of the elderly where they have these multi disciplinary meetings, where they have a social worker and that's done on a regular basis."

(Consultant 10 in General Interview)

In terms of communication mode, the discharge checklist of the case study NHS Hospital Trust (see Appendix 7) indicated that the nursing staff do not normally communicate with district nurses through a written record. The nursing staff would normally contact the district nurse by telephone, as suggested in the following commentary:

"I think the nurses usually phone up the district nurses if they want them to follow up. So they don't get any written communication."

(Registrar 05 in General Interview)

This contrasts with hospital doctors who would normally contact the patient's GP in writing. Hospital doctors seem to perceive that written communication is a better way to prevent missing something important. Using telephone contact was seen as less reliable:

"I think written is fine, I think written information is better because you don't have problems with communication, you know, you're less likely to forget stuff and if you're phoning someone, its not always very good. The only time I would phone a GP on discharge is if there was something they really needed to know, you know, but otherwise something written down is the best."

(Registrar 08 in General Interview)

It seems that only in specific and on rare occasions would doctors telephone GPs. For example, when a patient needs a specific follow up, or if the case is complicated, or there is sensitive information involved, as illustrated in the following accounts:

"If they need a follow up or anything specific, we might phone the GP as well, but that's quite rare."

(Registrar 05 in General Interview)

*"You might not necessarily want to say that to the patient because they'd find
that quite, you know, so yeah, there's some sensitive information you might just
phone through."*

(Physiotherapist 03 in General Interview)

The detailed execution of patient discharge may vary across organisations
depending on their local discharge policy. NHS Hospital Trusts discharge policy
documents normally contain information about patient discharge procedure. For
example, a new discharge policy (Vost and Siddorn, 2010) of a hospital in Bath
requires that the discharging nurse must complete a patient discharge check list; a
similar procedure is also in use in the case study NHS Hospital Trust (see
Appendix 7).

To summarise, discharge summaries are mainly used by hospital doctors to
transfer information related to medical aspects of the patient's ongoing care to
GPs. In specialties such as elderly medicine, information about non medical
problems may be included. Autonomous health professionals' responsibility for
specific aspects of patient care seems to result in the use of different clinical
documentation, as well as different communication and coordination methods, in
order to transfer the responsibility for the patient's care after hospital discharge.
The communication between doctors and GPs is almost exclusively through
written discharge summaries. In contrast, the hospital nursing staff often
communicate with the district nursing team in primary care via telephone.

4.3   Hospital practice of completing discharge summaries

The case study NHS Hospital Trust was implementing an electronic discharge
summary system at the time of the data collection. The implementation was
scheduled gradually ward by ward, starting with the Medical Assessment Unit
(MAU):

*"At the moment they're piloting the electronic one, they're rolling out the
electronic discharge summaries on MAU, so if they're MAU, they just get one*

electronic discharge. The rest of the hospital, they get the paper TTO[4] which
goes with the patient when they're discharged and then usually a formal dictated
letter."

(Registrar 07 in General Interview)

Thus, on many occasions during interviews, the informants made reference to the electronic discharge summary implementation of electronic discharge summaries. In addition, some of the informants also commented on their previous experiences with electronic discharge summary systems in other hospitals. However, this section is focused on the practice of completing paper based discharge summaries in the case study NHS Hospital Trust.

In a paper record environment, such as in the case study NHS Hospital Trust, there are normally two discharge summary letters completed after a patient is discharged:

"There's initially, there is a proforma filled in with the medication and the brief
diagnosis which goes immediately to the GP. The patient has one and the GP
gets one, so that's sent immediately the patient's discharged, and then when the
notes come back to me I then do a written discharge summary."

(Consultant 02 in General Interview)

"Well currently on this ward, there's a hand written, sort of TTO discharge
summary, which quite often the junior members of the team complete, and that's
followed up with a consultant discharge letter, which is typed."

(Registrar 06 in General Interview)

The accounts above indicate that the two discharge summary letters are completed within different timeframes. There is always a brief discharge summary letter completed and sent out immediately after a patient is discharged. A hospital doctor handwrites the brief discharge summary on a proforma or template, and she/he produces multiple copies of the letters using a carbon copy technique. The original letter goes to the patient's GP; the patient gets one copy, the pharmacy keeps another copy as the record for the dispensing medications, and the hospital

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[4] TTO stands for To Take Out. The TTO is discussed later in this chapter.

archives the last copy in the patient record:

> *"So at the moment you get a carbon copy piece of paper, four carbon pieces of paper, its written down and a copy of that goes to the patient, a copy to the GP, pharmacy, so pharmacy keep a record of the tablets, and the other one goes with the notes."*

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(Registrar 04 in General Interview)

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The immediate discharge summary letter is often called TTO (To Take Out), TTA (To Take Away) or flimsy discharge letter, and one of the junior doctors in the ward would normally be the author.

The other discharge summary letter, which was described as the *"proper"* discharge summary letter by informants, is usually dictated by senior doctors, for example consultant or registrar, and later typed by the consultant's secretary. The doctor can make multiple copies electronically. One copy normally goes to the patient's GP, other copies may go to other health professionals who were or will be involved in the patient's ongoing care. The doctors would normally refer to this as the full discharge letter or summary, dictated discharge summary, consultant discharge letter or just discharge summary. For the remainder of this thesis, the terms *"TTO"* and *"full discharge summary"* specifically refer to the *"flimsy"* and *"proper"* discharge summaries respectively.

4.3.1 TTO

A TTO serves as an immediate discharge summary record. TTOs were introduced some time ago as an earlier solution for improving discharge communication. One informant described that there was no TTO at the time when he was a junior doctor, which was about 30 years ago:

> I: *Ok, but a long time ago, you've played the part (TTO)*
> C02:   *Yeah, but we didn't do, a long time ago we didn't have those (TTO), I mean.*
> I: *Oh right, so when was it first introduced?*
> C02:   *Well I don't know, probably, probably about 20 years I would think, maybe a little longer than that.*

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(Consultant 02 in General Interview)

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The TTO was introduced as a quick fix for the problem of delayed full discharge summaries:

> *"Well, there is something about, the flimsy was a newer idea. It was still going when I first qualified which was 35 years ago. So the flimsy was probably a new idea 40 years ago and that was because GPs were complaining they didn't get information rapidly enough, particularly to know about changing treatments. So they wanted a quick and written thing by the houseman or the sisters and that was in response to that need. Because it take a while to dictate letters and get them typed."*

> *(General Practitioner 01 in General Interview)*

GPs would expect the information about changes in treatment, with medication amendments appearing to be the most critical information required by GPs.

The solution developed at that time and still in use, was to use the discharge prescription, the list of drugs prescribed for the patient to take home, with any additional information. This serves as an immediate, but temporary, discharge summary letter. The idea is that a GP receives immediately the information of the patient discharge and their most current medication:

> *"Well they were just as a prescription chart, basically being used initially just as a prescription to put the medication down that the patient needs to go home with, and the diagnosis is added to that."*

> *(Consultant 02 in General Interview)*

> *"Your TTO is a prescription; it's a prescription with extra information."*

> *(Registrar 04 in General Interview)*

Interestingly, the TTO appears to be unique to NHS Hospital Trusts and not used in private hospital practice because full discharge summaries are sent out immediately on patient discharge:

> *"Other hospitals, I mean private hospitals don't have these sheets (TTO), you know, there's a letter done, the doctor does a letter to the GP straight away and the letter goes out and the prescription, the take home prescription is just on the regular drug chart."*

> *(Consultant 02 in General Interview)*

A TTO was completed by one of the available doctors in the ward, who would normally be a junior doctor. A junior doctor can be a house officer (HO) or senior house officer (SHO)[5]:

> "The discharge letter is done by the ward staff, usually either the House Officer or the SHO usually do that letter."
>
> (Consultant 02 in General Interview)

> "Usually in this hospital, the TTO is done by the house officer, FY1."
>
> (Registrar 07 in General Interview)

As the imperative is for the TTO to be completed immediately, in the absence of junior doctors, doctors who are more senior are required to complete the TTO:

> "Well usually the discharge summary is written by the junior doctor, like house officer, if there is no house officer, SHO and if these two grades not available then registrar has to do it or even the consultant has to do it."
>
> (Registrar 09 in General Interview)

In addition, the TTO has to be completed before patient discharge in order for the pharmacist to supply the patient's take home medication; this was described in the following account:

> "you're supposed to predict when they're going home and ideally do it a day or so in advance, ok, but often it's a spontaneous decision, oh, its ok, they're better, so then the junior doctor had to do the TTO then and as soon as its ready, it goes down to pharmacy, they sort out the tablets, it comes back, and one copy is for the patient. So they can't go until it's all sorted."
>
> (Registrar 04 in General Interview)

Normally, the TTO is filled and signed by a junior doctor; then it goes to the pharmacy in order to dispense the prescription. The pharmacist will check the prescription chart, dispense the drugs, sign the TTO and obviously keep one copy as a record. If the drugs are dispensed on the ward, the role is taken by the nurse as described by the informant:

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[5] These grades are equivalent to the foundation year doctors (FY1 and FY2) in the new grading system; the grading system of a medical doctor's training career is presented later in this chapter, in the section of pragmatic perspective of discharge summaries.

"whoever's dispensed the tablets has to sign it, so that's the pharmacist, unless they're dispensed on the ward, at which point the nurses sign it."

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(Registrar 04 in General Interview)

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This process can delay the actual patient discharge, particularly if the drugs are dispensed in a dosette box. A dosette box, or tablet organiser, is an individualised box that organises medication tablets into compartments by day and time in order to simplify the taking of medications. It is commonly used for patients with complex medications or elderly patients. If this is the case, then the TTO is completed two days in advance of the proposed discharge day to prevent any delay. The following exchange illustrates this process:

> R04:   *The other thing is, and its on this one here (patient case notes used for the simulation), it says dosette, if you've got a dosette, then it needs to go down to pharmacy two days in advance, because they have to make up the dosette, ok, so they have rules, they have rules and they're very strict about their rules.*
> I: *So the patient discharge can be delayed?*
> R04:   *So the patient, yeah, theoretically, they will try their best, but they have rules, so the TTO must be done two days before they go home if they have a dosette box.*

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(Registrar 04 in General Interview)

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After dispensing the drugs to the patient, one copy of the TTO goes with the patient. The original one is sent to the patient's GP via second-class post, and may also be faxed. This would normally be on the same day or at most within two days of a patient discharge:

> *"Yes, the TTO goes with the patient on discharge, then they take it to their GP or it gets sent to their GP on the same day, or within two days."*

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(Registrar 05 in General Interview)

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> *"Ok, well the TTO, which is the hand written one from the ward, that's quite, you know that's what the pharmacists use, and quite often that's faxed across to the GP surgery on the day of discharge so that the GP knows what's happening."*

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(Registrar 06 in General Interview)

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In practice, the GP will receive the TTO within a few days or at most one week after the patient is discharged. If the patient goes to the GP earlier, the GP will

have access to the TTO copy held by the patient:

> *"The patient has a copy, so it doesn't matter. If the GP is called to see the patient, even later that day, there is a copy for the GP to look at, because the patient has one. So theoretically as soon as the GP sees the patient, they've got the information."*
>
> *(Registrar 04 in General Interview)*

The last TTO copy is kept as a record in the patient notes in the hospital. All patient notes are then sent to the consultant's office where the full discharge summary for the patient is completed

4.3.2 Full discharge summary

Hospital doctors and GPs would normally consider the full discharge summary as a *"proper"* and *"complete"* discharge summary letter. A hospital consultant or other senior member of the medical team would normally be the author of this letter. There were several reasons offered why a full discharge summary is completed in addition to the TTO written by the junior doctors. Firstly, the TTO was not considered to provide enough detail or was seen as inaccurate:

> *"The problem would be, first of all if this wasn't in enough detail, because realistically it's the juniors that fill in the TTOs and if its not enough detail, if they don't put enough detail on, if there isn't a letter, that will never get checked, so the GP might have completely vague inaccurate discharge summary."*
>
> *(Registrar 08 in General Interview)*

In contrast, the full discharge summary provides accurate information about the patient's medical care and compensates for any information deficits in the TTO:

> *"Well the main thing is, this (TTO) is generally filled out by one of the junior doctors who doesn't necessarily know why all these changes are being made and doesn't know why that diagnosis has been made and doesn't know what all of it means necessarily and so the dictated letter is there to say what's going on, to answer any questions, so that the GP fully understands what's going on."*
>
> *(Registrar 07 in General Interview)*

> *"My discharge summary is basically to make sure that firstly its accurate, it gets accurate information about the care of the patient"*
>
> *(Consultant 02 in General Interview)*

In the account below, the GP informant made the comparison between the full discharge summary and the TTO:

> *"It would normally have a better consideration what has happened. We get things handwritten (TTO) that are chest pain queries, stoma queries, myocardial infarction and the consultant may send a letter saying that that was just a chest pain not a heart attack. You get a more considered opinion"*
>
> *(General Practitioner 01 in General Interview)*

Secondly, when completing a full discharge summary, the senior doctors will read through the patient notes and investigation results carefully, including those recorded after the patient is discharged, to provide a comprehensive picture of the patient's care during the hospital stay so that the GP will fully understand what happened to the patient. So the rationale for the full discharge summary is the accuracy and comprehensiveness of the information given to GPs:

> *"Let's say someone needs, [patient name], in this case, there's an ultrasound documented, so you know in this case, there's an ultrasound that's been organised, but there's no documentation in the notes of what the ultrasound report is, for example. So someone needs to look at the ultrasound in this case and document what the result of the ultrasound scan was. So when you dictate the formal discharge letter, whoever dictates that letter should go through all the results, go through everything and make sure nothing has been missed. You know, there's the histology result in this case for example. So the letter, formal letter, should say the histology was x, y and z, it doesn't need any follow up. But the formal letter should tie up all of those things and make sure nothing is missed."*
>
> *(Registrar 08 in General Interview)*

Thirdly, by reading through the patient case notes thoroughly, the senior doctor can make a reasoned decision about whether or not the patient needs any specific follow up from the hospital as described in the following statement:

> *"Thirdly to decide whether or not the patient needs any surgical follow up, because a lot of the patients don't need follow up. So I can then say no follow up or I can arrange a follow up time for the patient, because there's no point following all the patients up [...] so sometimes, when I'm doing the discharge summary, I will write a letter to the patient saying, you know, because sometimes we'll need to do an extra test and I'll say further to your recent admission, I need*

to do this special x-ray and you'll get an appointment through the post. So I'll work that with, you know, that's part of going through the results to make sure everything's complete. If it is not complete, if there's something that hasn't been done that needs to be done, then I will organise it, there and then."

(Consultant 02 in General Interview)

"Is more explicit about the follow up that the patient might be having."

(Registrar 06 in General Interview)

A consultant was considered by the informants to be the ideal clinician to complete the full discharge summary, even though in practice registrars also undertake this task. Consultants appear to have the authority to decide who will complete full discharge summaries on a regular basis. Some consultants may normally take on this role and only delegate the task to registrars when they are unavailable, as described by Consultant 02:

"And the discharge summary is done by me or if I'm away on holiday I would get one of my middle grade staff, doctors, or middle grade surgeons to do the discharge summaries for me."

(Consultant 02 in General Interview)

In contrast, some registrars have to complete the full discharge summaries on a regular basis:

"I had to do all the discharge letters and if I am not around then sometimes consultants. The registrar has to do it, sometimes consultants, they do it, but they rarely do it."

(Registrar 09 in General Interview)

The consultant may also exclude some doctors from the responsibility to complete the full discharge summary for other reasons:

"In general, consultants won't let some doctors do it, either because their English isn't very good and the secretaries won't be able to hear them very well on a tape or they're just not very clever."

(Registrar 04 in General Interview)

Full discharge summaries are completed some time later, after the patient is discharged. The patient notes need to be delivered to the designated doctor's office and the doctor needs to find time to complete the full discharge summary. These two important factors were emphasised in the following comment:

> *"The very variable thing about the discharge summary is the length of time it takes to get the notes to me and whether, and the time that I can actually spend doing the discharge summary."*

> *(Consultant 02 in General Interview)*

In a paper record environment, after a patient is discharged, the patient notes need to be delivered to the senior doctor's office, otherwise the doctor may not even know that the patient has been discharged:

> *"The patient goes home, after they go home, the notes arrive in a senior doctor's office and we dictate a full complete discharge summary."*

> *(Registrar 04 in General Interview)*

Unfortunately, the transit of patient notes in hospitals is not always reliable. Consequently, some patients may not have a discharge summary completed due to misplaced notes. This account was offered by Consultant 02:

> *"Sometimes the notes will disappear, some patients won't get a discharge summary because somebody will come into here and take the notes away and not tell us that they've taken them away. So there are problems with the system, there's no question about that, there is a potential for people, you know for people to come and take the notes off the shelf here and you know, and take them out of the office, in which case the patient won't even get a discharge summary. I mean it doesn't happen often, but it does happen."*

> *(Consultant 02 in General Interview)*

This raises particular concerns for patient safety since the GP may not have all the required information to provide follow up care with the patient if the full discharge summary is never completed or received. Also if the patient is readmitted, some aspects of care may not be recorded or summarised effectively.

Assuming the patient notes are accessible to the senior doctor, she/he needs to go through the records carefully. This is ideally undertaken when the doctor is less likely to be distracted. The busy clinical environment was not seen as the ideal time, or place, to complete the full discharge summary as shown in the following commentary:

> " the dictated letters are done in a more controlled environment when you haven't got other pressures on your time, you haven't got, you're not going to be bleeped away to an arrest call and you haven't got sick patients waiting for you to go and see them. So that's the fundamental, there's two fundamental differences, the individual doing it is different and it's done at a very different time."
>
> *(Registrar 07 in General Interview)*

> "I mean I'm not going to sit on the ward and write them, because I have to find a time when I can actually do that, you know, so I sit down and I put some time aside, sometimes it is in the evening, sometimes Saturday morning, sometimes its during the working week."
>
> *(Consultant 02 in General Interview)*

Availability of time for busy hospital doctors to undertake the task seems to be a significant issue related to completing the full discharge summary. Consequently, patient notes tend to accumulate until the doctor responsible for completing the full discharge summary has time, as described by the informants below:

> "Yeah, but I mean its not, you know, the consultants have enough work to do already without having to do (dictated summary), you know, this kind of thing…. but the reason that you don't do the letter straight away, you know, is that you don't always have time and so what would happen is it would build up and build up and you'd have patients at home for a few weeks."
>
> *(Registrar 08 in General Interview)*

> "For the dictation letter, you pile it because we registrars not only have inpatients, also we have to do the outpatients, so sometimes it depends, sometimes when we're on call, we can't do any of this paperwork. So the discharge dictating letter is a bit late. Sometimes, I notice when I did the dictation letter, its been for about one and a half months ago, patient been gone home."
>
> *(Registrar 09 in General Interview)*

For some of the participants, accumulating patient notes was intentional so that the task could be undertaken in a batch with other paperwork. It was seen as a

time saving strategy for some senior doctors:

> *"I tend to do a lot, a bundle at a time, I don't tend to do one or two at a time. I would tend to wait for them to build up. But also the other thing that I haven't said is I also, we have to fill in some cancer proformas for audit, for the colorectal cancer, so when I do a discharge summary I also do the audit form."*
>
> *(Consultant 02 in General Interview)*

In addition, the full discharge summary needs to be typed for legibility. The consultant's secretary normally does the typing. Afterwards, the documents come back to the doctor for signature before posting to the GP:

> *"The discharge summary, I dictate it, my secretary types it and then I sign it and its sent off to the GP."*
>
> *(Consultant 02 in General Interview)*

Some doctors may be happy to type them on some occasions, as with the informant Registrar 04:

> *"I can dictate anything I want, that can be as long as I want, that can be five pages, I've had one that's 5 pages long, because it's so complicated. Actually I typed that one myself because it wasn't fair on the secretary."*
>
> *(Registrar 04 in General Interview)*

These delays – patient case notes routing, availability, or priority, of senior doctors to dictate the full discharge summary, typing up the letter and posting – all contribute to the overall delay in the receipt of the full discharge summary by a GP. The availability, or priority, of senior doctors to dictate the full discharge summary seemed to be the most significant factor in the delays. In terms of a time frame for completing the full discharge summary, two to four weeks appeared to be seen as common:

> *"And then after they've gone home, usually within about two weeks, we do a dictated summary that would go to the GP."*
>
> *(Registrar 05 in General Interview)*

Given the additional time required for typing and posting, the letter frequently arrives at the GP practice more than two weeks after discharge:

> *"You know, if you're the person that does the discharges and you're away for two weeks, then it's a minimum of two weeks, then the secretary has to have time to type them up. I would imagine on average it's between two and four weeks for the formal discharge summary."*
>
> *(Registrar 08 in General Interview)*

A month seems to be a common timescale in the experience of the GP informant:

> *"Then a fuller report that is dictated by the consultant is may be as much as a month later. I think they try for earlier but often it is a month."*
>
> *(General Practitioner 01 in General Interview)*

The primary recipient of the full discharge summary is the patient's GP. In practice, the full discharge summary is often copied to other relevant health professionals. As the full discharge summary uses electronic copy technology, which can produce infinite copies of the record with the same reproduction quality, additional recipients can be other doctors who have looked after the patient or who will follow up with the patient, as suggested by the informants:

> *"You might get an 80 year old lady who's come in with an exacerbation of her COPD (Chronic Obstructive Pulmonary Disease), but she's been ok, she's been under the elderly care doctors, but a few weeks later she needs to be seen by a respiratory chest physician and what we will do is when she's discharged, we will dictate the normal discharge summary, send a copy of that to a respiratory physician, as well as a dictated letter that says dear Dr such and such, could you please review this 80 year old lady in your respiratory clinic on a non urgent basis."*
>
> *(Registrar 04 in General Interview)*

> *"So any other consultants that are involved in the patient's care, any community matrons that are involved in the patient's care, sometimes patients get copies of the discharge summaries if they request them, specialist nurses if relevant."*
>
> *(Registrar 06 in General Interview)*

However, what the other health professionals do with the full discharge summary letters is not recorded in this study.

4.3.3 Between the ideal and reality

The perceived value of the discharge summary seemed to be measured by the status of the author and the timeliness of delivery to the GP. The GP informant held the opinion that the ideal discharge summary would be written by a consultant and sent out on the day the patient was discharged:

> *"But if the information that the consultant is going to give could be given on the day of discharge it will be supreme."*
>
> <div align="right">(General Practitioner 01 in General Interview)</div>

The argument that seniority of the doctor completing the discharge summary often influences the perception of the quality of content of discharge summary was also echoed by hospital doctor informants:

> *"So the discharge summary and TTO are only as helpful as how much is written and how accurate that information is, and that depends on who's writing it [...] you know, but you'll only improve them and make them accurate by actually having the consultants or the senior grade doing the discharge summary."*
>
> <div align="right">(Consultant 02 in General Interview)</div>

> *"Because the quality of the discharge also varies depending on who's doing it [...] depends on the seniority of the doctors at hand and obviously individuals as well."*
>
> <div align="right">(Consultant 10 in General Interview)</div>

All informants agreed that any delay can be problematic; sooner was always seen as better:

> *"All the delays are a problem. The sooner the better. I would really like it electronically on my computer the moment the patient leave the hospital. I thought all the delay is a problem."*
>
> <div align="right">(General Practitioner 01 in General Interview)</div>

> *"I think the sooner the better and ideally as soon as the patient goes is when they should, the discharge letter should go."*
>
> <div align="right">(Consultant 10 in General Interview)</div>

As discussed in Chapter Two, current NHS policy requires delivery of discharge summaries to GPs within 24 hours after a patient discharge. If a full discharge summary, written by senior doctors, can be retrieved within 24 hour post-discharge by the GP, then there is no need for a further discharge summary letter:

> *"I mean the ideal situation would be a formal discharge letter on discharge, then you wouldn't have a half way house. The TTO is like a half way house [...] ideally you wouldn't need to, ideally you'd need just one, you know, which would suffice."*
>
> *(General Practitioner 01 in General Interview)*

In reality, getting the senior doctors to complete the discharge summary letter immediately on patient discharge appears to be an unattainable objective, hence a compromise system is required:

> *"It's better for a balance between getting it done and getting it done properly"*
>
> *(Consultant 10 in General Interview)*

In addition, some delays are seen as necessary, particularly if there are pending investigation results at the time of patient discharge. Senior doctors wait for all relevant investigation results to be retrieved before they complete the full discharge summary. In this case a delay is justified for ensuring the completeness of the discharge summary.

On the one hand, hospitals cannot discharge a patient without a discharge summary. On the other hand, to deliver an immediate full discharge summary completed by a senior doctor on patient discharge appeared to be unachievable, as implied in the following remark:

> *"I don't think there's any way to have a full and thorough discharge summary at the time of discharge, that's the problem. But you need something at the time of discharge. I don't think you can do away with not having something at the time of discharge, but I don't think its possible to have the full letter at the time of discharge."*
>
> *(Registrar 08 in General Interview)*

It is against this background that a system with a TTO and full discharge summary was introduced. However, there are some issues associated with the completion and delivery of the TTO and full discharge summary in current practice.

4.3.4 Issues with the TTO

Junior doctors, who are less experienced compared to other members of the medical team, would normally be the authors of TTOs. One informant suggested that the authorship was determined by availability of junior doctors:

> *"Time, it's the problem of time and availability because you must remember the patients can't be sent away from the ward if they are an in patient unless they have a discharge summary and the only people who are present in the ward all the time are the junior doctors [...] There's many more juniors standing there, as you go, you kind of get a pyramid, you know one consultant with lots of middle grades and even more further down the line, junior doctors.".*

> *(Consultant 10 in General Interview)*

Availability may not be the only reason. Completing the TTO was frequently not seen as the priority, or task, of senior doctors, as illustrated in the following discussion:

> *I: What's the reason usually? (Why junior doctor do TTO)*
> *R04:   Because it's a boring job.*
> *I: It's boring, alright.*
> *R04:   Senior doctors have more important things to do than write TTOs, yes.*

> *(Registrar 04 in General Interview)*

Senior doctors seem to consider doing the TTO as a boring routine and prefer to delegate the task to junior doctors available in the ward, who it seems do not have the power to reject or negotiate it.

This practice prevailed despite the wide recognition that junior doctors are inexperienced and may not fully appreciate the significance of some clinical information related to the patient's care, as illustrated vividly in the following remarks:

> *"I will look at all the test results on the computer to make sure we haven't overlooked anything and make sure that we haven't missed anything that's*

important, because sometimes the more junior doctors don't fully appreciate the significance of certain tests coming back abnormal…because they're not, they don't have enough knowledge, it's a knowledge thing, it is an understanding thing."

<div align="right">

(Consultant 02 in General Interview)

</div>

"The problem is you need a higher level brain to make a discharge summary (full discharge summary). Usually the houseman is too inexperienced to put it all in perspective. So the houseman is filling in the discharge summary (TTO) is inputting at a lower level."

<div align="right">

(General Practitioner 01 in General Interview)

</div>

The lack of experience of junior doctors also affects the quality of the TTOs they write. Firstly, their lack of specialist knowledge means that they may potentially omit important information, or include too much irrelevant information. Alternatively, they may not complete sections of the TTO. One informant offered this insight in retrospect of her own experience:

"They're certainly probably more structured now, and I probably miss out a lot of the irrelevant information, I probably used to tell the GP every blood result the patient had had when they'd gone in the hospital and I don't think the GP really cares unless there's something specific that he needs to act upon or would be useful for his follow up, and then, you know, so you just go from, I now cut out a lot of information and just give specific things [...] I think their tendency would be to put lots and lots of them, information in there because they wouldn't be able to sort of filter out what was actually important, so they would put everything, or do they do the entire opposite and put nothing."

<div align="right">

(Registrar 05 in General Interview)

</div>

However, the lack of experience of junior doctors is not the only factor identified as contributing to poor quality TTOs; other possible factors were lack of time to complete the discharge summary letter properly, human factors such as laziness and ignorance and lack of awareness of the TTO's importance:

"The TTO is often written by junior members of the staff and so they often miss out information, not necessarily their fault, but it is often done in a rush, and at the end of the day or whatever, they're asked to do it urgently by the nursing staff. So often misses out important information."

<div align="right">

(Registrar 08 in General Interview)

</div>

"There's all sorts, there's many reasons, but I think it is going to be 1) is lack of time, 2) is laziness, 3) is a lack of awareness about what's important, and 4) is lack of awareness that the TTO is important."

(Registrar 08 in General Interview)

The inexperience of junior doctors was compounded by the absence of supervision and quality control by the senior doctors. The TTO is unlikely to be reviewed by any senior doctors as indicated in these exchanges:

I: Ah, I mean for a particular patient usually.
R08:   Oh, for one patient, one doctor will do the TTO.
I: So one person decide what information to put in and the same person
*   sign it.*
R08:   Yep.
I: Alright.
R08:   There's no checking.

(Registrar 08 in General Interview)

Only one of the informants would control the quality of the TTO when they delegate the task to junior doctors. Registrar 09 offered her experience to cope with the limitations of junior doctors in completing the TTO. Her approach was to scaffold the junior doctor completing the TTO:

""What I personally do is like I give it definitive diagnosis for each person to all junior doctors regarding all of my patients, so they know what diagnosis to be put here and then if I feel that some of the information is very important to let the GP know, and I remind them that you should put this and this, this, in the letter, so they put everything. But I don't know what the other registrars do."

(Registrar 09 in General Interview)

Moreover, the TTO is often handwritten using carbon copy technology. This medium appears to influence the quality of the report. The unreliability of the reproduction of the TTO copies impacts both GP and hospital doctors:

" The flimsy (TTO) is notoriously unreliable they are handwritten and usually you can't read what is on them and it is difficult to rely on the medications, reading it very carefully when it is badly written."

(General Practitioner 01 in General Interview)

"So you need at least four copies and this handwritten thing drawback is the copy, you know, there is, if you didn't put enough pressure to write down, it won't get through to the bottom copy and then its quite crazy, its like what

happens, is what I notice is like when I was doing the dictation letter, because there are four copies in the TTO, the top one be the good one, go to GP I think and the second one go to patient or something and the last one is put in the medical notes and when you do the TT discharge letter, you can't see anything anymore, so that's the main drawback."

(Registrar 09 in General Interview)

In this account, a hospital doctor recognised the limitation in terms of reproduction effectiveness of all copies of the TTO. Often when using carbon copy technology, the last copy in the stack has the poorest quality. This is the copy that normally goes into the patient notes. Consequently, when the consultant writes the full discharge summary, the TTO is illegible.

Figure 4.1 summarises the features of the TTO. The TTO was used by the NHS Hospital Trust for transmission of prescription information, notifying the patient's GP about the patient discharge and meeting the compliance requirements of the immediate discharge summary policy. The TTO has limited content, dominated by the discharge medication prescription. The content is influenced by the competence of the junior doctor completing the TTO.

Main purposes:
- *Transmission of current prescription*
- *Notify GP about patient discharge*
- *Compliance with immediate discharge summary policy*

TTO

To the patient's GP
Given to Patient
Pharmacy (as discharge prescription record)
As the patient's medical record

Poor reproduction due to carbon copy

Features of the TTO
- *Limited content (prescription)*
- *Influenced by limitation of author (junior doctors) capability + experience*
- *Inaccurate, missing, irrelevant information*
- *Minimal quality control of the completion by junior doctors*
- *Poor reproduction*
- *Often ' sanitised' to avoid inadvertent disclosure of information to patient*

Figure 4.1 Features of the TTO

Consequently, the content of the TTO may be inaccurate or irrelevant and important clinical information may be omitted. Some information may be sanitised to avoid inadvertent disclosure of information to the patient. A more striking issue is the seeming absence of any quality control despite recognition of the limitations of some junior doctors. Poor reproduction associated with carbon copy technology also influences its usefulness as a clinical record.

The design and brevity or functionality of the TTO content and its production, handwritten and carbon copied, reinforces a perception that the TTO is not important and is only temporary. Interestingly, the TTO was often referred to as a *"flimsy"*, a term that reinforces its temporary status.

4.3.5 Issues with the full discharge summary

In recognition of the deficiency of TTOs, the case study NHS Hospital Trust requires senior doctors to write a full discharge summary. In contrast to the TTO, the full discharge summary is often more complete and comprehensive. Senior doctors would dictate the letter and later the designated consultant's secretary would type it.

To ensure information fidelity concerning the patient's episode of care, the most appropriate authors would be consultants; however, not all consultants undertook this duty on a regular basis. The consultant, as the senior clinician in the team, appeared to have the authority to decide who should undertake the task and some delegated it.

However, the absence of regulation and control on delegation means that the tasks can be delegated to junior doctors, e.g. senior house officers (SHO) or house officers (HO), as indicated in the following statements:

"You're writing them (TTO) from your very first day as a doctor. You're only allowed to dictate them when you're an SHO, so you have to have been doing it really for at least a year and [...]But in general, all registrars and all consultants dictate letters and depending on which hospital you're in, you'll get SHOs dictating letters. But it depends on the hospital and the consultant you work for, because some consultants don't like SHOs doing it, they want registrars and consultants to do it."

(Registrar 04 in General Interview)

"The proper discharge letter, it depends on the hospital, some of the hospitals, the senior house officer can do it, house officers can do it now."

(Registrar 09 in General Interview)

Another way to ensure the fidelity of the full discharge summary is for the doctor with the most knowledge of the patient's care to complete the discharge summary. The assumption is that hospital doctors who have the real knowledge about a patient and their journey of care create better discharge summaries:

"My experience and opinion is that the people who do the discharge summary should be the people who know the patient best. So if you're doing a discharge summary you should only do it on patients that are on your team. Anyone else, as far as possible, you should get their own team to do it, because they know the patient better, they can write all the details in [...] its because you go through the case, you go through all the notes, you go through things. It's easier if you know the patient, because then you can know, you remember everything that happened to the patient."

(Registrar 08 in General Interview)

However, in the absence of any regulation on quality control, it was common for a senior doctor to construct the full discharge summary for a patient she/he did not know. In this case, they rely on the patient notes as the source of data, as shown in the following exchanges:

R05:   *We quite often do discharge letters where we don't provide any care.*
I: *How confident are you when you do it?*
R05:   *If it's been straight forward, you're usually fairly happy, sometimes if what happens in the notes doesn't really add up, I would explain to the GP that I hadn't actually met the patient and this was what I'm interpreting from the notes happened.*

(Registrar 05 in General Interview)

Unfortunately, the patient case notes are sometimes not sufficient as a source of data. Another issue is the poor filing system in the patient notes. The use of

electronic reporting systems could, to some extent, remedy the unreliability of patient notes to facilitate the construction of discharge summaries:

> *"Yeah, on the paper, and I tend not to look at the results actually in the notes, I tend to just look at them on the screen, on the computer screen, because sometimes they don't get filed properly in the notes. So you can't necessarily rely on those things getting into the notes, so when I'm doing the discharge summary, instead of rifling through the notes, through the results section of the notes, and because the filing is poor and sometimes they're in and sometimes they're not and sometimes they're in the wrong place."*
>
> *(Consultant 02 in General Interview)*

In addition to the poor filing system in patient notes, the absence of a robust book keeping identifying which patients require full discharge summaries is also an issue. Consequently, the senior doctor relies on the patient notes being on their desk, or shelf, to act as the trigger to complete the full discharge summary. However, this approach is not reliable:

> *"I mean the problem with the system's not that good because you rely when you say which patient has been in, I rely on what notes come to me for discharge summaries rather than having a list that I can tick off and say these are the admissions under my name, these are the discharges that I've looked at. So I'm sure we miss things that don't come to the desk, some of these notes come and get sent somewhere else, never reach me, then I don't know about it."*
>
> *(Consultant 10 in General Interview)*

Completion timeliness is a fundamental problem in the current full discharge summary process. The case study NHS Hospital Trust appears to be relaxed concerning the control of timely completion of full discharge summaries:

> *"So it's a lot quicker, but in last hospital in [area name], we're just doing the paper handwriting, like here initially, paper handwriting followed by the formal dictation and it takes ages and I find that it's very hard. I've got three shelves of case notes piling up and some are two to three months ago, so it's quite a bit of a nightmare."*
>
> *(Registrar 09 in General Interview)*

A concern for the GP informant was that the full discharge summary often arrived weeks or months after a patient was discharged. They would expect the full discharge summary to arrive sooner given that the TTO was unreliable:

"in discharge summary, the hand written one (TTO), to be honest, I don't, as a GP, I don't read anymore than that as a rule [...]there is a great impetus to get this (full discharge summary) thing out on time. But sometimes they were very much delayed. So weeks for instance and just occasionally somebody it does not happen something the letter is missing and just occasionally the consultant letter doesn't arrive for months and sometime we have to push them, fax them or remind them."

(General Practitioner 01 in General Interview)

Figure 4.2 sums up the features of the full discharge summary. The full discharge summary is intended to satisfy the requirement of an accurate and quality discharge summary. The completion of the full discharge summary is influenced by the relocation of patient case notes to a senior doctor's office and the time availability and priority of the doctor to undertake the task. The delegation to undertake the task on a regular basis seems to be decided by the consultant. However, currently there is no control on that delegation, so it has the potential to be inconsistent. Most importantly, the lack of regulatory approach in current hospital practice seemed to contribute to the problem of delayed full discharge summaries. Completion timeliness is dependent on the availability of senior doctors and the priority they place on the task.
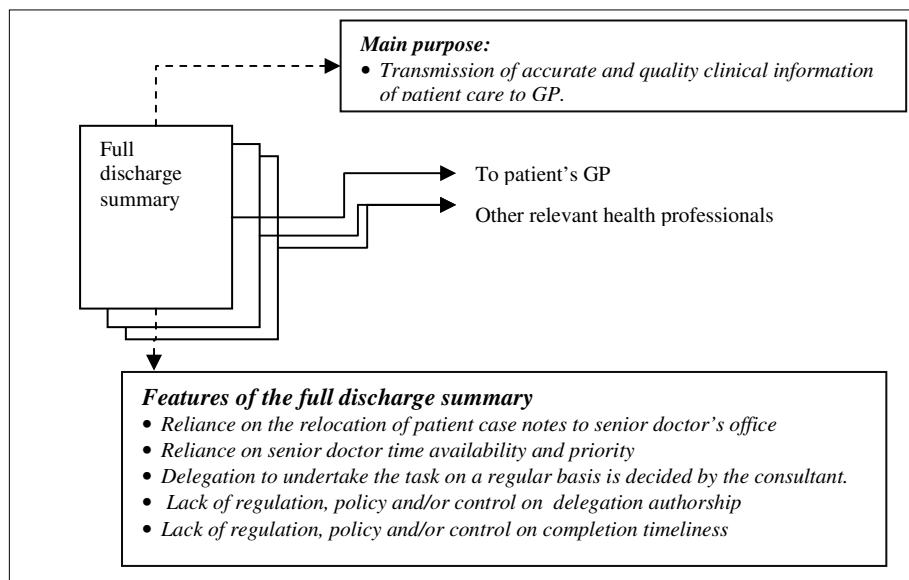
Figure 4.2 Features of the full discharge summary

4.4 Factors contributing to issues associated with discharge summaries

The system of two discharge summary letters, TTO and full discharge summary, seems to be historical and a solution to the GPs' complaint that they were not notified promptly following a patient discharge. However, the solution does not appear to have solved the problems of poor data quality and delayed discharge summaries. This chapter has presented the patient discharge process and the practice of completing discharge summaries in the case study NHS Hospital Trust. The investigation aims to explicate the hospital practice and other factors that contribute to the problem of poor data quality and delayed discharge summaries. Figure 4.3 presents a summary of the findings from this investigation.

The objective to deliver a quality *"and"* timely discharge summary seems to be unattainable using the two discharge summary letters approach. The TTO is immediate, but often too brief, incomplete, irrelevant, not concise and illegible. Full discharge summary may be more complete but often unacceptably delayed. The delegation to junior doctors, who normally lack the medical experience and knowledge to complete TTOs appears to be a major factor that contributes to poor data quality. The apparent absence of regulations, or controls, on delegation also contributes to this phenomenon. This is compounded by the lack of training and supervision given to junior doctor to undertake the task properly. This could be custom and practice acting as a smokescreen leading to organisational ignorance. There appeared to be a view, within the case study NHS Hospital Trust, that junior doctors were not competent to undertake the task. However, no junior doctors took part in this study and therefore this view cannot be judged or verified. Other factors that may influence the quality of TTO production include handwritten data entry and poor reproduction technique that make the discharge summary or copy less legible. The lack of formal feedback from GPs possibly due to the one-way nature of discharge communication also may contribute indirectly to poor data quality.

Hospital Practice

- patient admission
- Patient's episode of care
- Consultant authorise discharge
- Doctors complete TTO
- Pharmacy dispense medication
- Nurse organise supportive care and undertakes discharge check list
- Patient discharge

Discharge planning

timeframe

TTO is sent

R

1-7 days

- Relocation of patient notes
- Senior doctors dictate full discharge summary
- Secretary transcribe and type letter

FDS is send

R

2 - 4 weeks (or more)

R = Receipt by GP

Causative Factors

- Hand written data entry
- Poor reproduction technique
- No formal feedback from GP
- No training/supervision
- Lack of experience
- Delegation to junior doctor
- No regulation/control on delegation
- No book keeping of which patient requires full discharge summary
- Reliance on receipt of patient notes
- Awaiting investigation results
- Low priority and availability to undertake the task timely
- No regulations/control on timeliness
- Dictation + transcription process

Identified Issues

Poor Quality:
- Incomplete/missing
- Irrelevant
- not concise and/or too brief
- illegible

Missing/No full discharge summary

Delivery delays

Figure 4.3 Problems associated with discharge summaries

111

The issue of delayed discharge summaries appeared to be related to the low priority given to the task, and the low availability of senior doctors to dictate the full discharge summary in a timely fashion. This seemed to be compound by the absence of regulations and controls to ensure the timely completion of discharge summaries. Other contributory factors include the reliance on the receipt of patient case notes as the trigger to complete the discharge summary, delays whilst awaiting investigation results, and the dictation and transcription process.

Besides the issues of poor data quality and delayed discharge summaries, this study also identified that missing discharge summaries may be a consequence of absence of robust book keeping. The reliance on receipt of patient notes as the notification to create the full discharge summary lacks reliability, and, as is reported in this study, prone to system error.

4.5 Summary

This chapter has presented the patient discharge process and the hospital practice associated with the completion of discharge summaries in the case study NHS Hospital Trust. This chapter highlighted the role of a discharge summary within the context of multidisciplinary aspects of the patient's ongoing care. A discharge summary appeared to focus on the medical aspect of the patient's ongoing care, and may not provide a holistic perspective of the patient's ongoing care needs. Moreover, the two discharge summary letters approach was problematic. The apparent lack of regulatory approach in the completion of discharge summaries led to the substandard hospital practice. This included the delegation to undertake TTOs to junior doctors without any prior training, supervision or further validation. This substandard practice, together with other factors, including the low availability and priority given by senior doctors to undertake discharge summaries and the limitations of the technology used to create discharge summaries, contributed to the problem of poor data quality and delayed discharge summaries.

CHAPTER 5 PRAGMATIC, SEMANTIC, SYNTACTIC ASPECTS OF DISCHARGE SUMMARIES

5.1 Introduction

This chapter offers an understanding of discharge summaries from a semiotic perspective. Discharge summaries will be analysed in terms of their pragmatic, semantic and syntactic characteristics. This aspect of the investigation aims to provide a greater understanding of the features of discharge summaries in real world use, and how the information in discharge summaries is actually interpreted or used, and the implications for improving discharge summary systems.

The syntactic aspect is concerned with the structure and presentation of the discharge summary record. The discussion related to semantic aspects offers a number of frameworks to interpret a range of information in discharge summaries. The analysis of the pragmatic aspect attempts to identify contextual factors in real practice that influence the semantic and syntactic features of discharge summary records. The findings in this chapter are based on the analysis of a range of different data. The analysis of pragmatic and semantic aspects were based on informant interviews and discharge summaries produced from the simulation with participants. The analysis of the syntactic aspects was based on the discharge summaries producing through the simulation and a number of examples of discharge summary proformas and layouts from various sources. The findings from all these analyses are presented in the following sections.

5.2 Pragmatic aspects of discharge summaries

The findings related to the pragmatic aspects of discharge summaries can be summarised in this statement: A discharge summary is a record about a patient's care, which is completed by a hospital doctor with the facilitation of a data entry system, to serve different purposes associated with a patient discharge. Discharge summary records, the TTO and full discharge summaries, have a range of functions associated with patient discharge. These functional contexts influence the way the information about the patient's care is presented in discharge

summaries. Various factors related to the patient admission, their problems and length of stay in hospital influence how their discharge summary is constructed. Similarly, a number of factors related to the author and data entry system used may systematically influence the features of discharge summaries. All these contextual factors that influence the characteristic of discharge summaries are presented in the following sections.

5.2.1 Functional contexts

Discharge summaries are recognised as a means of communication between hospital doctors and GPs on patient discharge. A closer scrutiny of the current practice of using two discharge summaries, TTO and full discharge summary, in the case study NHS Hospital Trust revealed that the discharge summaries may serve a range of different functions, which will be explained in the subsequent discussions.

5.2.1.1 Compliance with the medico legal aspect of patient care transfer

One of the purposes of the TTO and full discharge summary is to comply with the medico legal aspects of care services provided by clinicians in the hospital and their handling of the transfer of the patient's care to primary care providers. The awareness of the medico legal aspects of discharge summaries was expressed by the GP informant:

> *" I would just thought that it is just a legal record."*
>
> *(General Practitioner 01 in General Interview)*

This is supported by the fact that every patient discharge, no matter how simple the patient case is, must have a discharge summary record even if a follow up care is not required:

"it's standard practice, every patient has a discharge letter written."

(Physiotherapist 03 in General Interview)

As a transfer document endowed with medico legal implications, the discharge summary must provide enough information to ensure smooth and safe transfer of responsibility for the patient's ongoing care. Additionally, the discharge summaries have to comply with record keeping standards in terms of content, presentation, data entry, access and retention to ensure the quality and utility of the records. Recently, the RCP developed generic medical record keeping standards (see Table 2.1 in Chapter Two), which specify some of the requirements in terms of content and format in order to comply with the medico legal aspects of a transfer document.

For example, standard number two requires that the patient who is the subject of the documentation must be identified clearly in the document. In a paper based environment, the patient's identifiable information, name and NHS number should be recorded on every page of the record. Similarly, the hospital location where the patient was treated must be recorded under the same heading. Standard number three necessitates a medical record to have a standardised structure and layout. Standard number five mandates that transfer documents such as discharge summaries must be recorded using a standard proforma[6]. Standard number six implies that the author of the clinical record must be identified and authenticated by a signature.

Additionally, the information must always be legible and appropriately dated and timed. Standard eight requires the name of the most senior doctor, who is responsible for making the discharge decision, to be recorded in the discharge summary. Standard nine states that the name of the health professional who is

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[6] For this reason, the Royal College of Physicians, under NHS CFH funding, has developed and recommended a standard discharge proforma for hospitals. The proforma is tested and evaluated in this project through the simulation with informants based on anonimysed patient case notes.

responsible for the patient's continuing care must be recorded. Additionally the actual date and time of the transfer must be specified. Thus, the requirement to comply with the medico legal aspects of transfer of responsibility for the patient's care will ultimately influence the content and presentation of discharge summaries.

5.2.1.2 A Notification and information update for GPs

Hospital doctors are responsible for notifying the patient's GP immediately about patient discharge and for providing enough information for the GP to continue the patient's care. Other primary care based health professionals may also be notified if they are involved in providing ongoing or supportive care for the patient. District nurses will normally be contacted by the discharging nurse prior to patient discharge if ongoing nursing care is required.

Most of the time hospital doctors will only notify the GP about a patient discharge through a discharge summary. If the patient does not see the GP immediately after the discharge, the GP will have to rely on receipt of the discharge summary to know that the patient has been discharged and may require their attention:

> *"I suppose, there is the notion that the GP won't know that the patient has been discharged unless the letter has arrived. And in antiquity GP would visit their patient when they are discharged from hospital as part of the routine, but I don't think that routine occurs now. It is more usual for the patient to go to see their GP if they have to after discharge from hospital when it becomes necessary. So one point was to notify the GP that the patient is no longer in hospital and they may need some attention"*
>
> *(General Practitioner 01 in General Interview)*

Ideally, a discharge summary must contain enough detailed and relevant information for GPs or other carers and should be delivered immediately after a patient discharge. In the case study NHS Hospital Trust, a TTO is used to notify GPs about a patient discharge, but contains a limited amount of information. A full discharge summary provides detailed information about a patient's episode of

care and ongoing care needs, but is often unacceptably delayed. Delay reduces the value of the information and may compromise patient safety.

5.2.1.3 A means for follow up coordination

Follow up information in discharge summaries is an element of coordination of care (Starfield, 1998; Weinberg et al., 2007). Follow up information is important, and hospital doctors often highlight and emphasise this information in the discharge summary:

> *"then follow up, erm, goes at the bottom and they put the problems in bold type and they put the follow up in bold type, so if the GP can't be bothered reading lots in the middle, they know what the problems are and they know what the plan is, ok."*

> *(Registrar 04 in Simulation Interview)*

The follow up section details the information that is important to ensure continuity and safety of the patient's care. Hospital doctors may remain involved in patient follow up, as there may be some aspect of the patient's ongoing care which still requires surveillance by specialist providers. In addition, the hospital doctor may find, after the patient has been discharged, that they have missed something important and/or additional tests may be required. Hence the TTO can contain follow up information, however, more often the full discharge summary contains a more definite follow up plan. Other primary care based health professionals and services may be involved in follow up care, however, the information related to the coordination with these health professionals is unlikely to be present in a discharge summary. The discharge summary seems to be exclusively used to coordinate the follow up between hospital doctors and GPs.

One key aspect of the coordination is to inform the GP when hospital doctors are going to withdraw totally from follow up. GPs assume full responsibility for the patient's care only when hospital doctor has fully withdrawn from the patient's follow up care:

"Well because, if we put that in, well because we would tell them if we are going to arrange an outpatient appointment, yeah, and if, and therefore we tell them if we aren't. So for some people there'll be no follow up and for some people there will be follow up. So the GP needs to know if there's going to be a follow up, so if there's a follow up they'll need to know so when the GP sees the patient he can say ok well you're going back to the hospital next week for a check up, that's fine I don't need to do anything. If there's no follow up arranged and there's a problem with the patient, then that means that tells the GP he's got to tell us, yeah."

(Consultant 02 in Simulation Interview)

"So it is nice to know when the consultant is no longer responsible for the care of that patient."

(General Practitioner 01 in Simulation Interview)

This information occasionally must be inferred because the discharge summaries, the TTO and full discharge summary, may not contain any follow up information. For some informants, this should be interpreted that there is no further follow up from hospital doctors:

"But if you weren't to put anything in, weren't to inform the GP at all, they would just have to assume that there wasn't any follow up for anybody".

(Consultant 02 in Simulation Interview)

Another important aspect of a follow up coordination is a commitment to undertake the responsibilities indicated. Sometimes a consultant may miss his/her commitment to undertake follow up. This failure may compromise patient safety:

"Then I am assuming that they are going to be seen again and they might not be. I had a complaint at the moment that is ongoing which has that exact problem; that the consultant said in his last letter 'I would see the patient in six months'. And we didn't know that the patient did not go back and continued prescribing medication which is hazardous assuming that he would continue to monitor him. And anyway he is alive and it is all okay but it could have gone very wrong."

(General Practitioner 01 in Simulation Interview)

A GP may sometimes need to remind the hospital doctor about his/her commitment to follow up the patient as indicated in a discharge summary. This account was offered in the following remark:

> *"But very often GPs will refer to the formal letter, so if you've said we ought, say in the letter if you write outpatient follow up in 6 weeks, then what happens is that let's say it gets to 6 weeks, the patient says I should have had an appointment in 6 weeks, the GP looks at it and says oh yeah, you're right, so they can say your discharge letter said that the outpatients in 6 weeks, we haven't got it yet, so often they refer back to it."*

> *(Registrar 08 in Simulation Interview)*

Patients can be actively involved in order to ensure that follow up is undertaken. This could be done by telling a patient about their follow up plan and giving them a copy of the discharge summary on their discharge:

> *"I suppose it's always good to tell patients, and I increasingly try and inform them so that they, if something goes wrong and they don't get seen, or they don't get the follow up to clinic, they can check on it and follow it up [...] Yeah, just to make sure, you need to let patients know, because they look after themselves better than anyone else does and unfortunately the system's not fail proof, so you always find people slipping through the net."*

> *(Consultant 10 in Simulation Interview)*

In a follow up coordination, the GP must be informed about any potential problems associated with the patient's ongoing care that may require their attention. This is particularly crucial if some interventions from the GP are required before the consultant meets the patient in an outpatient clinic:

> *"So if there have been any changes in the medication and they need to review the repeat (prescription) and do some blood tests in a couple of weeks or if they've been started on some antibiotics and they need to review whether or not the patient's got better within a week or so, and that sort of information needs to go on."*

> *(Registrar 07 in Simulation Interview)*

The information related to care interventions required from a GP should be concise and specific. This insight was summed up by one of the informants:

> *"I don't think the GP really cares unless there's something specific that he needs to act upon or would be useful for his follow up, and then, you know, so you just go from, I now cut out a lot of information and just give specific things."*

> *(Registrar 05 in Simulation Interview)*

If hospital doctors request the GP to undertake specific follow up, the GP will require an explanation, this would ideally be captured in discharge summaries. Deficiencies in this information may trigger the GP to call the consultant to find out the information he/she requires. This was evident in the following exchange:

> I: *So how about the things when you get the call back from the GP?*
> R04:   *They just want to know what's happened, or the patient's been asked to see them for follow up and they don't know why yet. So the patient is asked, go see your GP in four weeks time for your blood pressure checking, they go and see their GP, their GP goes why are you here. So that's quite common. Or sick notes, if they need to know why their sick note needs to continue, so they need to know that kind of thing.*

> *(Registrar 04 in General Interview)*

Also hospital doctors may want to ensure that GPs follow up any requests and advice given in the discharge summaries. Without an explicit coordination protocol, patients are used as bearers of information and act as triggers to initiate follow up care:

> *"Often we write instructions for the GP have to check the blood in two weeks to ensure renal function's ok, so I'm not sure whether that actually ever gets done. I mean often we'll give the patient a card and say take this to your GP practice, so there's a trigger to get their bloods checked. "*

> *(Registrar 05 in Simulation Interview)*

5.2.1.4 A prescription order to supply take home medication

One of the purposes, discussed earlier, of the TTO was its function as a prescription. The reason for this merging is because both the discharge summary letter and the discharge prescription needed to be completed prior to patient discharge. As a rule, a patient should be discharged with a supply of his/her current medication. Thus, a prescription is written in order for the pharmacist to dispense the drugs. The prescription and medication dispensing need to be completed before patient discharge:

> *"It has to be done before they go, because it's their prescription. This is a prescription, so you can't send them home without their tablets."*

> *(Registrar 04 in Simulation Interview)*

Thus, the TTO, would normally contain medication prescription. The prescription information would normally be separated from the remaining information. This often influences the hospital doctor to consider the data entry for the prescription as an independent sub task in completing the TTO:

> *"The drugs always get filled in, always, because that's the only way the patient gets their medication is if that's filled in and it goes to pharmacy [...] I mean like, yeah, that's about the only reason it is done, is because the patient needs their medications."*
>
> *(Registrar 05 in Simulation Interview)*

> *"So with the carbon copy TTO, I would put all the patient's details in, then I would do the description of their stay and then I would do the prescription last."*
>
> *(Registrar 04 in Simulation Interview)*

Another important consequence of featuring a prescription chart in the TTO is that the doctor prescribing the medication must sign the letter as suggested in this imperative statement:

> *"It is a prescription, so if you write it, you've got to sign it."*
>
> *(Registrar 04 in Simulation Interview)*

A prescription chart usually consists of a list of drugs and instructions for administration. The prescription items in the TTO are often presented in a similar structure and include information such as drug names, administration instruction such as dose, frequency and route, and duration. The recurrence of the pattern suggests that they are best represented in a tabular format to enable speedy reading, comparison and comprehension. A standard format is useful for pharmacy electronic systems to calculate the supply quantity automatically.

5.2.1.5 The medical record of patient's episode of care

Discharge summaries are not only beneficial for GPs to have an understanding of what happens to patients during their hospital admission. The same information is also useful as a record of a patient's episode of care. For this reason, a copy of the

discharge summary is normally kept in the patient notes. This account was offered in the next comment:

> *"I also write it to make sure that there's a record of that information in the notes. So it's also the relevant information that I think needs to be in the notes. The next time somebody opens the notes to look at what's been happening, I think that it's the information that I think should be there. It's not necessarily all the information that could be there, it's the relevant information I (emphasizing) think is what's required."*
>
> *(Consultant 02 in Simulation Interview)*

One of the informants described that she often added extra medical information in a discharge summary for her own benefit. This information was not necessarily relevant for GPs, but it was useful as part of the patient's medical record:

> *"I put in a lot of information that's probably not relevant to the GP because like we say we use the letter when someone gets readmitted, so I put in the information for my own benefit, so you know, we reel off the co morbidities, the GP already knows all the co morbidities, that's an irrelevance to them, but it's of relevance to us".*
>
> *(Registrar 05 in Simulation Interview)*

Constructing a discharge summary as a medical summary record of the patient's episode of care has an advantage. It can save time for doctors who need to access the information about a patient's past admission:

> *"so that next time the patient's admitted, then that information is readily available without ploughing through the old case notes."*
>
> *(Registrar 05 in Simulation Interview)*

5.2.1.6 Input source for GP to update patient record.

The clinical record system in the secondary care services is inherently different from that used in GP practice. On a patient discharge, GPs need to update the patient record, based on the information available in discharge summaries, so that the record reflects the most up to date status of patient information and treatments:

> *"It is what has happened to the patient in their journey, it is a bit of a curiosity, to find diagnosis and because we are going to encode that in general practice and we are going to make any changes to medication."*
>
> *(General Practitioner 01 in General Interview)*

GPs would expect the discharge summaries to contain the information they require to update the patient record, and the information is better represented in a structure that is recognised by the GP system. When the information is missing or represented in an inappropriate structure, this will raise an interoperability issue. TTOs often do not have sufficient information for record updating, as described by the GP informant:

> *"The information that matter to me as a GP, the stuff that I used to try to get down, first and the most important is the changing medication, then the next most important is the diagnosis, the next important is what the patient has been told, and I aim to get those down. But in discharge summary, the hand written one (TTO), to be honest, I don't, as a GP, I don't read anymore than that as a rule".*
>
> *(General Practitioner 01 in General Interview)*

Ideally, if the hospital's Patient Administration System (PAS) and the GP system are connected to each other, the transmission of the discharge summary will be immediate and the process of updating the patient record in the GP system can be automated. However, this will require the content, structure and format of the discharge summary to be standardised and aligned with the content and structure of patient record in the GP system.

In reality, hospitals are slow at adopting electronic records compared to GP practice. This opinion was offered by General Practitioner 01:

> *"At the moment it seems to me that the hospital electronic system are lacking from the GP one, because most of them have this sort of format, the paper format and all our thing in primary care are electronic."*
>
> *(General Practitioner 01 in General Interview)*

For this reason the integration between hospital electronic record and GP electronic record systems is one of the primary targets in the NPfIT agenda.

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5.2.2 Patient related factors

Patients are the main subject in discharge summaries, and the content and presentation of discharge summaries is largely influenced by the characteristics and complexity of patient problems and the manner of their admission. Firstly, how a patient is admitted to hospital may influence the way the discharge summary is written. For example, if a patient is admitted through the Accident and Emergency Department with new symptoms there may be a lot of information to put in his/her discharge summary. On the other hand, if a patient is admitted for a planned operation and is discharged immediately afterward, the content of his/her discharge summary is likely to be brief:

> *"An acute patient who just comes in off the street and come in with a totally new symptom, you need to write down what he came in with, you need to write down whether there were any complications, you need to write down the progress. Whereas if you had somebody who has an operation and he's going to be discharged, say within a few hours, you've got no time to write complications and progress, but because you haven't had time to develop any of that."*

> *(Consultant 10 in Simulation Interview)*

Similarly if a patient's episode of care is short, both the TTO and the full discharge summary tend to be quite short and have less information. On the other hand if a patient stays in the hospital for a long period of time, the discharge summary tends to be long in order to capture the different problems and key incidents, interventions and tests during the patient's episode of care. This account was described in the following exchange:

> *I:*   *And can you tell me what might be the main difference in the way you create TTO compared to the dictated one.*
>
> *R05:*   *I think if it's been a short admission, there's no difference, you know, because there's not much information to give. If somebody's been in for a long time, or especially in elderly wards, they can be in 6 weeks, 3 months, you know anything, quite a long time, and then on the TTO you've not got room to put all the different problems that arose, so you just put the main diagnosis and then when you do the dictated one, you give them a bit more information, explain why it was such a long admission, explain the problems that occurred and all the test results and things.*

> *(Registrar 05 in General Interview)*

Secondly, the level of complexity of patient problems and complications may also impact on the degree of elaboration in the discharge summary. If the patient problem is simple and routine, the discharge summary tends to be straightforward. On the other hand, if the patient has many complications, the full discharge summary tends to be longer and more elaborated:

> *"So older people have more problems and are more complicated and need bigger discharge summaries."*
>
> *(Registrar 04 in General Interview)*

Thirdly, the risk profile and disability associated with a patient often requires extra consideration for the follow up treatment plan, and this would normally be reflected in the discharge summary. For example, elderly patients may have a certain level of permanent disability associated with decreasing physical mobility and cognitive functions due to the ageing process.

As a result, an elderly patient is more likely to be followed up with additional supportive care in addition to, or instead of, follow up in an outpatient clinic:

> *" I mean a lot of elderly patients, we won't follow up in clinic because it's quite arduous for them to come to the hospital for an appointment. So unless there's a specific reason, like you want to review treatment or you want to repeat blood tests, then we wouldn't."*
>
> *(Registrar 05 in Simulation Interview)*

On the other hand, because of the high risks associated with the deficiency in their physical and cognitive functions, the information regarding the condition of these functions is likely to be featured in the discharge summary. Normally, this information goes on the full discharge summary rather than to the TTO. This was offered in the following account:

> *"Some, especially elderly people you'd put in the discharge letter something about their mobility, their incontinence, their cognitive function, all that goes in the, in a dictated summary. But there isn't room to put that on a TTO."*
>
> *(Registrar 05 in Simulation Interview)*

Patients with a specific risk profile may also require specific follow up treatment. For example, a patient following a cerebral vascular accident (CVA) has a high risk of another incident. On patient discharge, an outpatient clinic follow up is often arranged. This follow up is necessary to educate the patient as part of secondary prevention. Hence, an outpatient clinic follow up is pretty standard for a patient admitted for the first episode of CVA:

> *"Erm, I think so, I think certainly stroke patients, we usually tend to follow them up to discuss the sort of secondary prevention. So to go, because obviously sometimes there's quite a lot of information for them to take on board at once. So by the time you've got home, you can check the blood pressure and you can check what medication they're taking, things about stopping smoking, if they were drivers, you can discuss whether they can go back to driving, so three months is probably about right for somebody who's had a stroke."*
>
> *(Registrar 05 in Simulation Interview)*

5.2.3 Author related factors

The personal preference of the author may impact on the content and presentation style of discharge summaries. This was described by Registrar 04 in the following account:

> *"In general my letters are probably about, the bulk, the text is about that much in times new roman 12, you know what I mean, yeah. But Dr (name)'s are very short, you know, they're like one line. They don't normally go above that much of free text for the whole, you know what I mean, you know, well a nice big paragraph."*
>
> *(Registrar 04 in General Interview)*

The purpose of this section is to identify factors related to authorship of discharge summaries that have a systemic effect on a discharge summary. This study identified at least three factors which have a systemic impact. These are the seniority and speciality of the author, and their experience of completing discharge summaries. The influence of these factors is described next.

The division of labour between junior and senior doctors in completing the discharge summary has been examined earlier in this chapter. Generally TTOs are

completed by junior doctors while senior doctors construct full discharge summaries. In order to understand this division, insight into the medical doctor training scheme is presented in the following section.

After graduating from medical schools, medical students will have to go through postgraduate vocational training on their way to becoming independent practitioners. Before 2007 and introduction of the Modernising Medical Careers (MMC) reform (Department of Health, 2004b), the medical school graduates were required to take one year pre registration house officer training (PRHO), two or more years senior house officer (SHO) training, four to six years specialist Registrar (SpR) training before they were eligible to be appointed as consultants in NHS Hospital Trusts.

The reforms attempted to streamline the process by eliminating the SHO training stage and extended the foundation training to two years with more exposure to different specialities. The first two years training involve six four month rotas in different specialities after which trainees choose and progress to their preferred Speciality Registrar (StR) training for another six years. The comparison of medical career training under the old and new systems is presented in Table 5.1. During interviews, informants tended to refer to the old system. Only occasionally, informants made reference to the new system. The old terms or grades are used to interpret informant statements.

The division of labour between junior and senior doctors was obvious in the interviews with informants. This dichotomy seemed to be closely associated with the status afforded to speciality training. Under the old grading system, both house officer (PRHO) and senior house officer (SHO) were considered as junior doctors while a specialist registrar or consultant was a senior doctor. Under the new grading systems, junior doctors are equivalent to foundation house officer (FY1 and FY2).

Table 5.1 Medical career training under old and new (MMC) scheme

Year	Old System	Dichotomy	New System (MMC)
1	PRHO (1 year)		Foundation House Officer
2	Senior House Officer (SHO)	**Junior**	(2 years)
3	(minimum 2 years)	**doctors**	Speciality Registrar (StR)
4	Specialist Registrar		in clinical speciality:
5	(4 6 years)		(6 years)
6		**Senior**	
7		**doctors**	
8			
9	Consultant (total 7-9 years)		Consultant (8 years)

Source: Department of Health (2004b)

Seniority understandably was an indicator of clinical knowledge and experience as well as authority in decision making for patient care intervention. Junior doctors were often associated with a lack of experience and less able to extract relevant information. The competence of senior doctors was related to their specialist skills and knowledge. This view was shared by Consultant 10:

> *"I don't think so, I think it is very difficult because lots of it comes with experience, searching out what is relevant and what's not and because we're speciality based, we kind of, we're able to see things from a different perspective and we understand what's pertinent and what's not, and sometimes the juniors don't have that yet."*
>
> *(Consultant 10 in General Interview)*

Junior doctors also had limited authority to decide on follow up plans for patients on discharge from hospital. This was evident in the following remark:

> *"(Purpose of full discharge summary) Thirdly to decide whether or not the patient needs any surgical follow up, because a lot of the patients don't need follow up. So I can then say no follow up or I can arrange a follow up time for the patient, because there's no point following all the patients up. Now the more junior doctors can't make those decision, so that's why I do, it's always someone senior like myself that does the discharge summary."*
>
> *(Consultant 02 in General Interview)*

> *"There are things that need to be followed up, that might get missed (in TTO), because again the junior doctor wouldn't realise, and it's not really necessarily*

their responsibility to follow up tests, that's up to the registrar and the consultant on the first hand."

<div align="right">

(Registrar 08 in General Interview)

</div>

This perceived lack of experience of junior doctors means the task of completing the full discharge summaries is unlikely to be delegated to them. The main responsibility of junior doctors is completing the TTO and prescribing discharge medications. Some extra information about the patient's problem and care may be added but it was likely to be limited. Follow up plans were unlikely to be featured in TTOs, unless the responsible senior doctors had decided what follow up was required and annotated the information in the medical notes prior to the patient discharge:

> *"Erm, usually the consultant will have specified on the last time we saw the patient, or within the last few meetings that they saw the patient when they went to follow up, or sometimes it's written on the TTO as well."*

<div align="right">

(Registrar 05 in General Interview)

</div>

In addition to seniority, speciality appeared to be an influential factor. The unique focus and practice within different specialities impacted on what was written in discharge summaries:

> *"We tend to stick more to the medical side unless there's something else that's more relevant, it usually takes a medical person to understand the medical problems and not, it's not like the holistic thing, obviously certain, it depends on the speciality you're working in, it becomes more relevant, especially in care of the elderly where they have these multi disciplinary meetings, where they have a social worker and that's done on a regular basis."*

<div align="right">

(Consultant 10 in General Interview)

</div>

The opportunity to complete full discharge summaries on a regular basis seems to be another factor that significantly affects the way hospital doctors write discharge summaries. It seemed that they have a greater appreciation of important information that should be in discharge summaries once they begin to complete full discharge summaries, consequently they tend to write a better discharge summary. This was reported by one informant who also argued the rationale

behind this:

> *"Yeah, once you move onto the discharge summary, the letter, I have found that since I started doing that (full discharge summary), my TTO is a lot more well structured [..]I think it's just the chance to go through the case properly, you know, you go through the notes, you know, you check everything that's happened, you make sure that anything that needs to happen isn't being lost, that's a real chance with the discharge summary.."*
>
> *(Registrar 08 in General Interview)*

Only through the experience of completing full discharge summaries does the hospital doctor become more critical about the limitation of the TTOs they and/or other junior doctors write. They become more competent in filtering information that is relevant for GPs.

They are also transformed from a *"drug prescriber"* into a *"story teller"*. This was evident in the following account:

> *"I think it's just that you realise what information it's important, you realise the GP needs to have information and you realise there's often a delay between the discharge letter. But the main reason my TTOs have become better is that you see sometimes TTOs done by some of the juniors are terrible, they don't have the right information, sometimes it's incorrect. The drugs are always correct, usually the medications are always correct, but it's the story, the case history that often doesn't do justice to the actual case. It's not an accurate representation of the case and so that, and GP's really will struggle if they don't have the proper information, and so for that reason, my TTOs have become a lot better*
>
> *(Registrar 08 in General Interview)*

5.2.4 System related factors

The system used for data entry inevitably contributes the features of the discharge summaries. There are at least three modes of data entry for completing discharge summaries identified in the current practice in the case study NHS Hospital Trust. Two of them are related to the paper record systems, the third is related to an electronic record which is currently being implemented in some of the wards. Each of these modes differs in terms of data entry and structure as described below.

5.2.4.1 Handwriting on proforma

A TTO was normally hand written on paper proforma, with a fixed structure and format, and signed. This mode of data entry is essentially designed for speed. It is handwritten and can be completed quickly and at any location in the hospital. The structure and headings act as prompts and data entry guidance. The prompts are generally useful for junior doctors who have less experience to make sure that important information is not omitted:

> *"for somebody who doesn't do very many, for the new doctors, it's really important to have those headings, so that they remember that's what the GP needs to know."*
>
> *(Registrar 04 in Simulation Interview)*

However, there are several drawbacks associated with the TTO's data entry. The fixed structure and format of the proforma can be restrictive, and the handwritten data is often illegible:

> *"There's only very, like one line for each heading on the TTO, so there's not enough room to include all the information you might want to include, and also the headings are quite descriptive, so it's not, you can't often put the information you want under those headings. On the discharge summary (full discharge summary) you can do that, yeah.*
>
> *(Registrar 05 in General Interview)*

> *"But that's for simple things like hernias and lumps and bumps and things like that, where you can have a generic sheet (TTO) as it were, because it's simple non complicated surgery. There's a lot of things that I do and for the acute you can't do that, there isn't a proforma that you can just suddenly populate, yeah?*
>
> *(Consultant 02 in General Interview)*

Another informant offered a strategy to deal with the rigidness of a proforma.

> *"I know what I want to write and I often cross off these headings, presentation, investigations, progress, because I just want to write a paragraph, ok."*
>
> *(Registrar 04 in Simulation Interview)*

5.2.4.2 Dictation and typing

In contrast to a TTO, a full discharge summary normally is dictated by a doctor and transcribed by a secretary. These are essentially two different processes; dictation is a data entry process, while transcribing is a process of presenting output. The division of labour between data entry and the output process was driven by two objectives; to remove the requirement for a doctor to type the letter, and to increase legibility. Dictation is time efficient for doctors and allows them, at the same time, to scan through patient notes. The dictation seems to reduce the multitasking burden on doctors. Additionally, data entry through dictation allows doctors a freedom to express the patient case in a full narrative style with no page limitations:

> *"I can dictate anything I want, that can be as long as I want"*
>
> *(Registrar 04 in General Interview)*

Using dictation may give a false impression that there is no structure in full discharge summaries. Indeed, all informants agreed that they have a structure for dictating the letters.

However, that structure may again differ from one doctor to another:

> *"Even in the narrative, I have some structure to what I say, yeah. Some people in their narrative actually put much more structure, they will say admitted this date, discharged that date, you know, this diagnosis, you know, people would put, I don't put that structure into it, but I mean I do it sort of sub consciously."*
>
> *(Consultant 02 in General Interview)*

> *"There isn't a nationally recognised structure, but different consultants like certain structures, so I think it's good to have a structure which is something like date of admission, presenting complaint, progress, diagnosis, complications, so you have the sub headings. So although it might be prose, it's still set out into the headings and a structure."*
>
> *(Registrar 08 in General Interview)*

The pattern used in dictation provides a structure for the secretaries who transcribe and type the discharge summaries:

> *"Yes, there's a pattern to make it easier for the secretaries, ok, cos, yeah, erm, so you would dictate that first, so that they know they've got the right patient notes and they've opened the right file on their computer. So that's the first thing you must say and then you start off with the date of admission and discharge, so they know they're talking about the right thingy, and then dear doctor, and then you've got to find the name of their GP, ok, and then you tend to write reason for admission, and then it tends to be just sort of one word at the top, so it can just be chest pain, or you know, pneumonia or whatever"*
>
> *(Registrar 04 in General Interview)*

Dictation may free a doctor from the necessity of typing a discharge summary themselves, but she/he still has to include instructions about grammar and format to guide the secretary. Thus, dictation by a doctor who completes a full discharge summary completion must not be considered as a normal speech. It should be seen as *"writing"* with voice:

> *"When we dictate, we're quite strict, so I would, I run the Falls Clinic, so you dictate all your grammar and everything as well [...] this lady has undergone a complete falls assessment, open brackets detailed overleaf, close brackets, and our recommendations are as follows, 1), such and such, 2), such and such. So we, yeah, you dictate your stops, you dictate everything, yeah."*
>
> *(Registrar 04 in General Interview)*

One randomised controlled study suggested that providing a standard template for dictating improved quality of content, decreased the time length of data entry, and made a more concise discharge summary letter (Rao et al., 2005)

5.2.4.3 Electronic application data entry

The introduction of electronic discharge summary records is driven by the many limitations of paper records. Illegibility, routing, access, retrieval, and slow transmission speed have all been recognised. An electronic discharge summary system is expected to overcome these limitations.

In an electronic discharge summary system, the data is entered (typed), guided by a clinical application user interface. One of the key benefits of an electronic application is that the computer can be programmed to control the data entry. For

example, the application can force users to fill mandatory data entry fields. This is not possible with the paper proforma and/or dictation:

> *"the electronic discharge summary is very clever, if you won't fill every box, you can't fill out the discharge letter. You have to fill out everything, very comprehensive."*
>
> *(Registrar 09 in General Interview)*

The mandatory field feature ensures completeness of data entry. The usefulness of this feature was seen as significant for increasing safety in the transmission of information related to medication changes to GPs:

> *"The electronic discharge prompts you at certain points, especially when you come to drugs, to know exactly whether you've changed something. So you can't complete the electronic discharge without specifying whether you've changed the drug and stating the reason for either stopping a drug or starting a drug. So I think it's very good in that way, it's very good for fool proof."*
>
> *(Consultant 10 in General Interview)*

The discharge summary application is normally implemented as a part of patient electronic medical record management systems[7]. Some information in a discharge summary such as patient admission and discharge details or medications can be easily imported from data already input to the system. Thus, the data in the discharge summary is more likely to be consistent.

In an electronic system, data entry, clinical record, and the printed version of clinical records can be structured independently. This separation allows the discharge summary printed out to be formatted dynamically based on the information provided at data entry. With a paper proforma, many irrelevant field may be left empty and the reader may not know if this is an omission, or not applicable. Although the electronic discharge summary system is not error proof as the person responsible for data entry may still omit important information, empty fields can be hidden from the final print out in order to provide a better

---

[7] The electronic patient record management system in the hospital is often called patient administration system (PAS).

reading view. Also a number of strategies can be programmed to force data entry or require non empty fields in order to proceed thereby reducing an unconscious omission.

5.3 Semantic aspects of discharge summaries

This section will analyse semantic aspects concerned with the interpretation of information in a discharge summary record. A discharge summary consists of information about a patient's episode of care, which is described from a medical perspective. Consequently, the concrete interpretation of information in the discharge summary often requires some understanding of medical knowledge. However, this study avoids the analysis of semantic aspects that require some level of understanding of medical knowledge as the author does not have the background in medical training. Instead, this section offers a number of semantic models from the literature to aid the interpretation of various information contained in a discharge summary record. These semantic frameworks are used to illustrate how various elements in discharge summaries should be treated and linked together to offer an interpretation.

The speech act semantic model demonstrates that some information in the discharge summary should be interpreted within the context of communication and interaction between health professionals. The mental frame semantic model is based on an assumption that the individuals uses a particular mental frame, information structuring, to interpret information, and to manage interaction and communication with others. Information structure in discharge summaries, to some extent, is the reflection of the mental frame of the authoring clinician or the designer of the discharge proforma. A number of mental frames associated with discharge summaries are presented. Lastly, some information in discharge summaries signifies entities in other external representation, and this will be discussed in the external representation semantic section (5.3.3).

5.3.1 Speech act semantics

The original Speech Act theory focused on conversational communication. However, it is applicable to other forms of human communication such as text communication as is the case with discharge summaries. This study identified a number of speech act contexts embedded in discharge summaries. These speech acts signify interaction, and/or communication, between different health professionals, junior and senior doctors in hospital, pharmacists and GPs.

Firstly, the medication information in discharge summaries appears to correspond to several speech acts between different actors as shown in Figure 5.1. These include speech acts between doctor and pharmacist, pharmacist and GP, and doctor and GP.
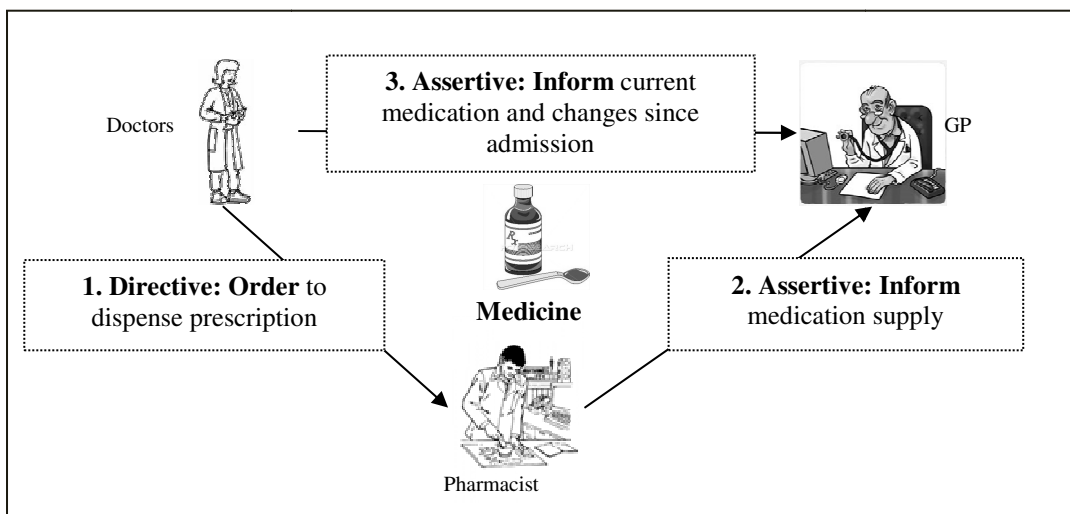
Figure 5.1 Speech acts related to medication element

The prescription in the TTO creates a speech act between the prescribing doctor and the pharmacist. It signifies the request from the doctor to the pharmacist in order to dispense the take home medications. This is a directive act with an expected action. The pharmacist has the responsibility to dispense the medication. For a short course of medication, the prescribing doctors would normally specify the quantity supplied. However, for a long course of medication or ongoing

medication, there is a minimum number of days' supply that must be provided by the pharmacist. For example, in the case study NHS Hospital Trust, the standard for dispensing is a minimum of a 14 day supply (see Appendix 8). Hence, it is important that the prescribing doctor states the duration of medication correctly if it is for a limited course. Unfortunately, vague terms are used to specify the duration of medication. For example, in the data collected, informants used a range of expressions to indicate ongoing medications, including, *"long term"*, *"continue"*, or left the section blank.

In the absence of any direction, the pharmacist still has to complete the supply quantity information on the prescription chart in the TTO. This is an assertive act from pharmacist to GP so that the GP can predict when the medication supply will be likely to run out. The supply information is often written in the format "*[days]x[tablets per day]*" in the TTO so that the GP will decode the number of days quickly as the information needed by the GP is when they will be asked to issue a new medication prescription for the patient.

From the hospital doctor's perspective, the medication information in discharge summaries, the TTO and full discharge summary, is to state the medications on patient discharge and any changes made during the admission. This is an assertive act. The information is important to the GP, so they can continue the ongoing treatment through medication prescribed to the patient. The GP also needs the information about changes to medication treatment since the hospital admission. They would normally update these changes in the patient health record. Unfortunately, the information about medication changes is only likely to be available on receipt of the full discharge summary, which arrives some time after the patient is discharged. Even though the TTO contains a data entry section for medication changes, junior doctors sometimes fail to complete this section.

Secondly, the information in discharge summaries contains speech acts of the hospital doctor designed to inform the GP about the patient's episode of care, and also to serve as *"aide memoire"* for hospital doctors. This is illustrated in Figure 5.2. This is an assertive act. While the intention associated with the information is the same in both the TTO and full discharge summary, the presentation of information is different. In the TTO, the information is presented as categories such as presenting problems, diagnosis, complication, investigations for data entries. In the full discharge summaries, the same information is presented as a clinical narrative. Issues related to different styles for presenting this information are discussed later in this chapter.
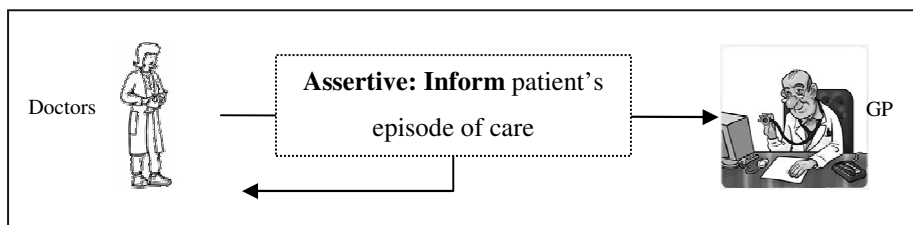
Figure 5.2 Speech acts related to information of patient's episode of care

The last speech act scenario is related to the follow up information in discharge summaries as represented in Figure 5.3. Follow up information is featured in both the TTO and full discharge summary. The illocutionary acts related to follow up information are commissive, directive and assertive acts.
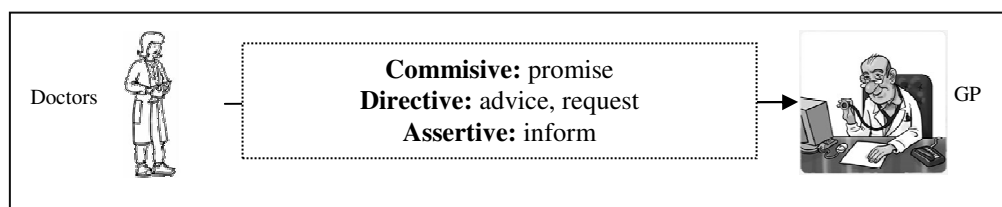

Figure 5.3 Speech acts related to follow up element

In a commisive act, the hospital doctor promises to do something. This can be a promise to follow up the patient in the outpatient clinic or send the GP further information about pending investigation results. The following illustration is an example taken from the discharge summary simulation in this study:

> *"OPD 6/7 (to come to ward for wound check + R.O.S), USS and wound aspirate results to be sent to GP"*
>
> *(Registrar 08 in Simulated Discharge Letter)*

As a promise, this requires the commitment of the hospital doctor to make it happen. The failure to do so may compromise patient safety:

> *"Then I am assuming that they are going to be seen again and they might not be. I had a complaint at the moment that ongoing which has that exact problem; that the consultant said in his last letter 'I would see the patient in six months'. And we didn't know that the patient did not go back and continued prescribing medication which is hazardous assuming that he would continue to monitor him."*
>
> *(General Practitioner 01 in Simulation Interview)*

Hospital doctors may also request or give provisional advice to the GP. Examples from the simulation with the informants are shown below:

> *"to monitor BP as approx 100/50 upon discharge, to reassess need to institute nicorandil, note slight constipated whilst I.P. nicorandil for persisting cardiac pain if BP allows"*
>
> *(Registrar 04 in Simulated Discharge Letter)*

These are examples of directive acts. GPs would normally expect that the hospital doctor explains the medical reasons and intentions behind the request or advice.

Additionally, follow up information may be about arrangements with other health professionals such as district nurses and community physiotherapists. In this context, the intention of hospital doctors is to inform the GP about the arrangement, which is an assertive act.

5.3.2 Mental frame semantics

Different speech act contexts, explained earlier, illustrate different cognitive situations that may be embedded in discharge summaries. Consequently, completing a discharge summary involves switching between different mental frames, as indicated in the following statement by an informant:

> *"I would put all the patient's details in, then I would do the description of their stay and then I would do the prescription last. "*
>
> *(Registrar 04 in General Interview)*

Some cognitive situations evident in discharge summaries include completing patient, admission and discharge details, prescribing and dispensing medications, reconciling patients' ongoing medication, coordinating follow up and writing a clinical narrative. This section offers some informal models of the mental frame associated with each cognitive situation based on the understanding gained from the various datasets collected in this study, including informant interviews and the data from the discharge summary simulations. Completing patient, admission and discharge details is excluded from the elaboration as this is more for administrative purposes.

5.3.2.1 Frame: prescribing and dispensing medication

The medication prescription chart on the TTO (see Figure 5.4a) and the RCP discharge proforma (see Figure 5.4b) provided the source for analysing the frame for prescribing and dispensing take home medication on patient discharge in this study.

(a) TTO discharge medication (Appendix 2)

(b) RCP discharge proforma's discharge medication (Appendix 8)

Figure 5.4 Medication element in discharge summaries

Figure 5.5 suggests the frame model for prescribing and dispensing take home medication. Both the prescribing doctor and dispensing pharmacist contribute to the data entry in the prescription chart. The prescriber's frame consists of the drug description and the drug administration instructions or directions. The drug description may contain elements such as identification name, substance name or product name, and form (tablets, cream, liquid). The administration instruction or direction may contain information such as dosage (amount prescribed at each time), frequency, route and duration of the treatment. This information is relevant to the pharmacist to ensure adequate supply of each drug. Given that patient may have some supply in the ward, the pharmacist only needs to dispense the remaining quantity required to take home.
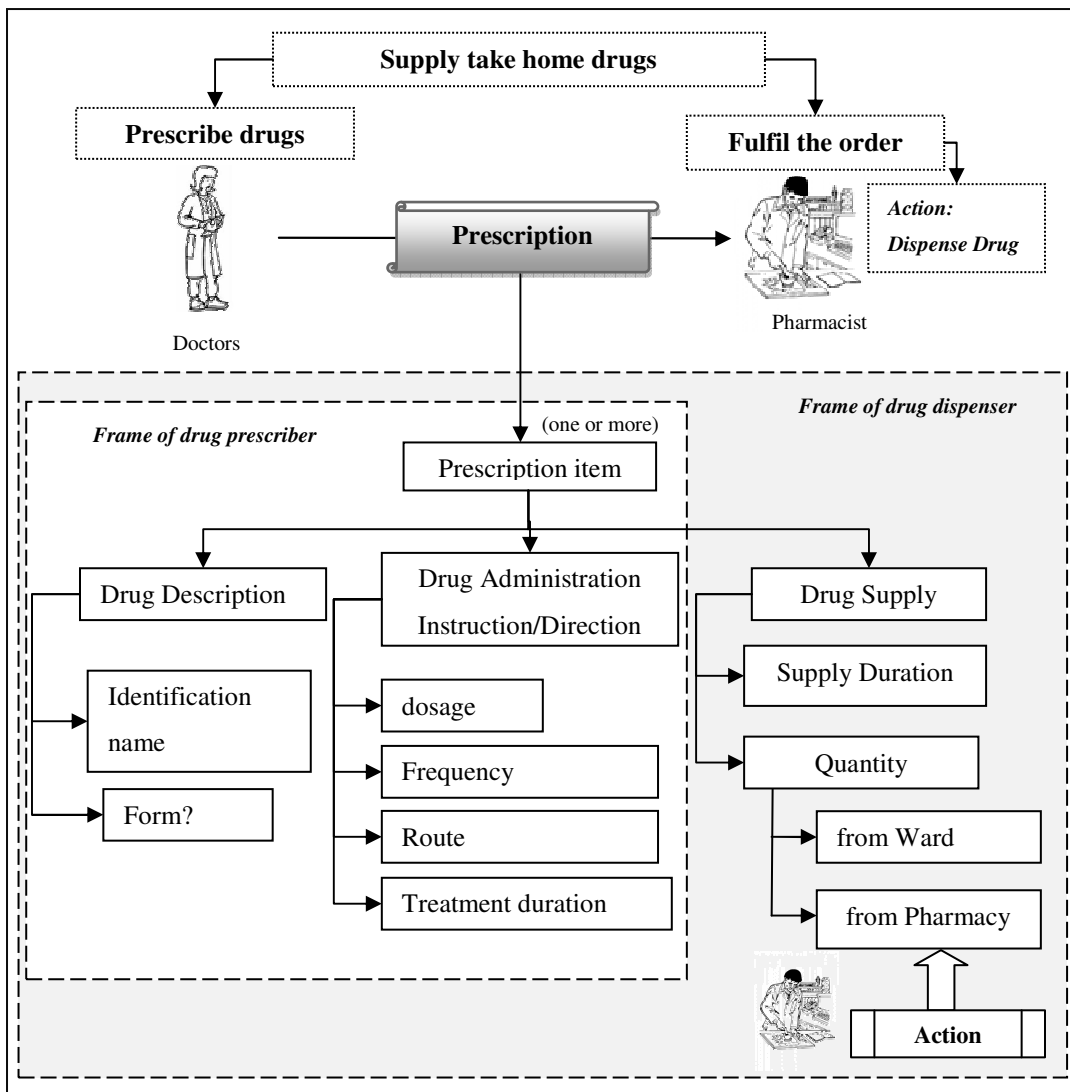
Figure 5.5 Frame model for prescribing and dispensing medication

5.3.2.2 Frame: reconciling patient's ongoing medication

On a patient discharge, the patient's GP would be required to reconcile patient ongoing medication. The mental frame associated with this mental task is shown in Figure 5.6. During the patient's episode of care in hospital, some of their medication may be stopped or changed for various reasons. Some of the medication that is stopped may be recommended at some point after the discharge. New short, or long, courses of medication can be added and may need to be continued after the patient is discharged.
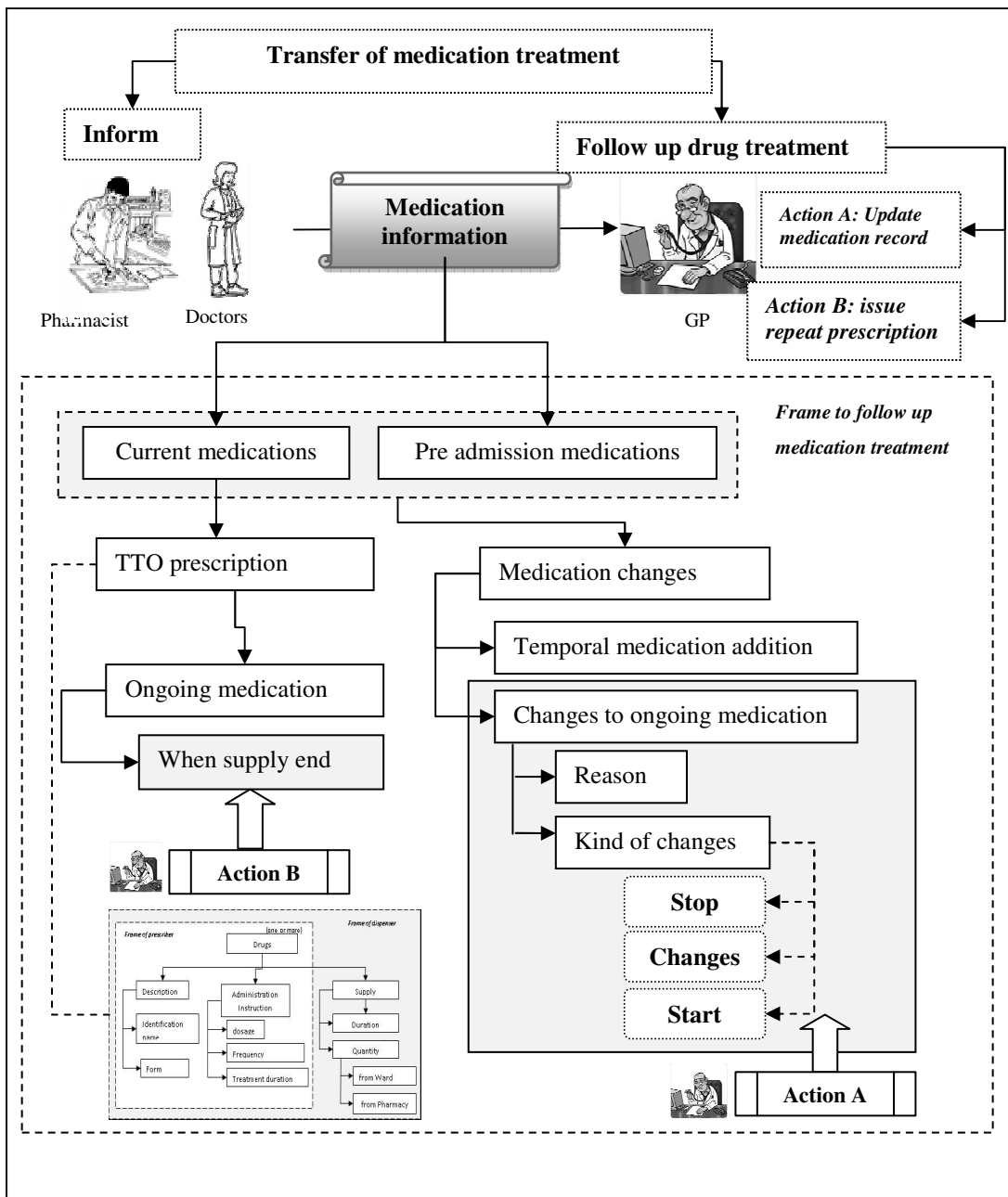
Figure 5.6 Frame model for reconciling patient's ongoing medication

A GP normally has the record of a patient's medication prior to the admission to hospital. In order to continue the medication treatment after patient discharge, the GP would need accurate information about any medication changes made by hospital doctors during a patient's episode of care in hospital:

"The information that matters to me as a GP, the stuff that I used to try to get down, first and the most important is the changing medication"

The prescription in discharge summaries, especially in TTOs, would tell the GP about the patient's current medication on discharge, but the detailed information about the medication changes during the patient's episode of care may not always be present in discharge summaries. The quality of information in the prescription, is known to be a source of drug errors:

"I think if you look at the mistakes we make, lots are to do with drugs. There are so many drugs often that don't get transcribed properly or, but increasingly the pharmacists are looking at these things and making sure that the drug charts correspond to what the patient should be having."

(Consultant 10 in Simulation Interview)

The patient may be still on *"temporary"* analgesics and/or antibiotics on discharge, and this was less interesting for the GPs in term of reconciling patient's ongoing medication. GPs are likely to concentrate on and only update long term and ongoing medications on the patient's record and skip the temporary medications:

"I mean lots of things are temporary, if you give antibiotics then they're temporary, if you give painkillers, they can be temporary, not a long term thing that the GP needs to continue with."

*(Consultant 10 in Simulation Interview)*

Hospital doctors may commence a new medication treatment that requires the GP to monitor and be responsible for the repeated prescription. The GP would normally expect the duration of treatment to be specified clearly:

"I mean I think it's the medication we've started, you could tell the GP how long you want the treatment to continue for, whether it's continuous or whether it's a course, because there are some other treatments that, you know, you give for a year. So I think if the GP, if they came in on that medication and the GP was already prescribing it, then, you know, it's their decision. But if we started a new treatment, then we should convey to the GP how long it should be."

(Registrar 05 in Simulation Interview)

Moreover, hospital doctors may stop, or change existing, medications due to complications or other medical reasons. Providing sufficient information about the clinical reasons for the medication changes is important and GPs appear to expect this information in discharge summaries in order to update the changes in patient record with confidence (see Action A in Figure 5.6):

> *"Sometimes they will have acted upon requests that we'll have put in the discharge summary, like could you check this patient's U's and E's one week and they phoned back and said this is the results and have you got **any further advice, or why have we changed the medications, if that's not been made clear on the discharge summary, they might phone up and clarify that."***

> *(Registrar 06 in Simulation Interview, author's emphasis)*

Information about the quantity of medication that is to be supplied to the patient on discharge may be important for the GP to estimate when the supply will run out and a repeat prescription will be required (see Action B in Figure 5.6), although this is likely to be initiated by the patient.

5.3.2.3 Frame: coordinating follow up

After a patient is discharged from hospital, different health professionals, for example hospital doctors, GPs, district nurses and other community health professionals may follow up the different aspects of a patient's ongoing care. This also needs some sort of coordination mechanism. Follow up information in discharge summaries not only tells the GP about any necessary follow up but acts as a vehicle for communication and coordination of follow up.

The frame model to illustrate the coordination of follow up is illustrated in Figure 5.7. The figure illustrates how, in any follow up coordination, hospital doctors may request, inform, or promise a follow up. In response, GPs may, respectively, fulfil that request, make contact with the patient or their carer based on the information or remind hospital doctors about promised follow up.
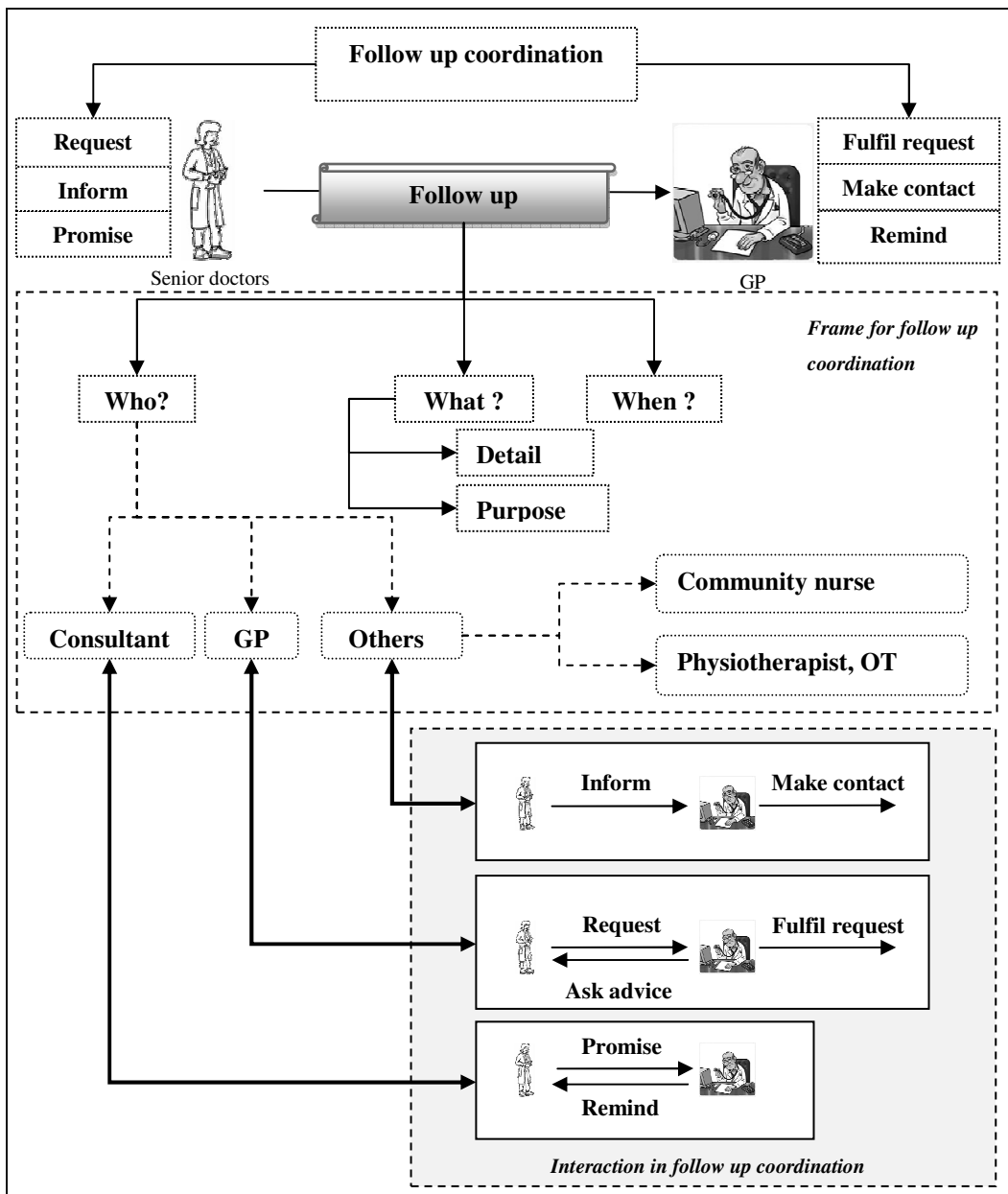
Figure 5.7 Frame model for follow up coordination

Follow up actions from the consultant are most likely to be required if there are pending investigation results on patient discharge:

> *"She's had an echo cardiogram requested, which the report that would go to the consultant whose care she was under and they'd act on it."*

> *(Registrar 07 in Simulation Interview)*

It is quite common that an outpatient clinic appointment is made to follow up the patient. Concerning the coordination between hospital doctors and GPs, the appointment follow up is a promise with an obligation to fulfil. This promise often implies that GPs do not need to act and will just wait for further notification from hospital doctors:

> *"So the GP needs to know if there's going to be a follow up, so if there's a follow up they'll need to know so when the GP sees the patient he can say ok well you're going back to the hospital next week for a check up, that's fine I don't need to do anything. If there's no follow up arranged and there's a problem with the patient, then that means that tells the GP he's got to tell us, yeah."*

> *(Consultant 02 in Simulation Interview)*

On the other hand, if the hospital doctors forget to organise the follow up, this hopefully will trigger GPs to act:

> *"But very often GPs will refer to the formal letter, so if you've said we ought, say in the letter if you write outpatient follow up in 6 weeks, then what happens is that let's say it gets to 6 weeks, the patient says I should have had an appointment in 6 weeks, the GP looks at it and says oh yeah, you're right, so they can say your discharge letter said that the outpatients in 6 weeks, we haven't got it yet, so often they refer back to it"*

> *(Registrar 08 in Simulation Interview)*

In another scenario, hospital doctors may request GPs to follow up with the patient. This should act as a trigger to GPs to seek justification and elaborate more detail and rationale for the follow up in order to fulfil the request properly:

> *"They just want to know what's happened, or the patient's been asked to see them for follow up and they don't know why yet. So the patient is asked, go see your GP in four weeks time for your blood pressure checking, they go and see their GP, their GP goes why are you here. So that's quite common. Or sick notes, if they need to know why their sick note needs to continue, so they need to know that kind of thing."*

> *(Registrar 04 in General Interview)*

Common practice is that the follow up instruction meant for the GP is passed to the patient. The following provides a number of insights about the reasoning underlying this practice:

"I suspect it's that they (GPs) never read it, I imagine. I don't know, I mean they don't need any more information or they don't read them until the patient comes to see them, however many months later, or..."

(Registrar 05 in General Interview)

Indeed, General Practitioner 01 confirmed this interpretation. He described that in current practice, GPs are likely to take a less proactive role to follow up patients:

"in antiquity GP would visit their patient when they are discharged from hospital as part of the routine, but I don't think that routine occurs now. It is more usual for the patient to go to see their GP if they have to after discharge from hospital when it becomes necessary."

(General Practitioner 01 in General Interview)

Moreover, GPs may seek advice to interpret the results of any follow up tests requested by the hospital doctors. In the last scenario, ideally hospital doctors may inform the GP about follow up that has been arranged with other carers such as a district nurse or a physiotherapist on patient discharge. The GP may want to coordinate with those carers involved in the patient's follow up care.

5.3.2.4 Frame: writing a clinical narrative

Writing the clinical narrative of a patient's episode of care is the major feature in the full discharge summary and sometimes in the TTO, particularly if filled by a senior doctor[8]. The new RCP discharge proforma also has data entry for the clinical narrative. A clinical narrative represents the story of the patient's episode of care as shown in the following exchanges:

I: When you fill the discharge summary, do you have any strategy usually?
R08:   No, just to try and do it in as much detail as possible and to make it structured, you know, you want to try and tell a story, you know, he came in with this, this is what happened, this is what we did, this is the diagnosis, these are the complications, this is what's happening next.

(Registrar 08 in General Interview)

---

[8] As pointed out earlier, Registrar 04 preferred to write with a narrative style in TTOs by crossing out the heading names and using all the available lines to write a paragraph.

As a story, the information tends to be presented in chronological order of occurrence. Causative relationships between the information are dominant in a clinical narrative as shown in the account below:

> *"Erm, I think for the TTO you just want to put, you want to make sure that the main diagnosis and the most important investigations are down and it tends to be brief bullet points, whereas the formal letter tends to be written in prose (narrative) and you tend to put, you just put more information there, what your findings were, what the findings were when the patient was initially assessed and what all the investigations that he had and what the reasoning was behind decision, which reasoning behind decisions doesn't tend to get put on the TTO".*
>
> *(Registrar 07 in General Interview)*

In writing a clinical narrative, clinicians seem to use both a temporal frame and a clinical reasoning frame as shown in Figure 5.8. A clinical narrative often starts with what happens to the patient on admission, any relevant medical history prior to the admission, clinical findings and interventions during the admission, what is the condition of patient on discharge, what clinical interventions are expected after patient discharge. Even in a short clinical narrative as shown in Figure 5.9, at least three temporal segments were found.

Another example of temporal segmentation in a clinical narrative is illustrated in Figure 5.10. The *"prior admission"* segment consists of past medical history; history of problems and medical treatments that are relevant to the problems presenting on admission, as shown below:

> *"Intermittent claudication left leg at approximately 500 yards. Recent onset of right calf claudication"*
>
> *(Consultant 10 in Simulated Discharge Letter)*

Because the presenting problems on admission are the focal point, more often the *"prior admission"* segment is presented afterward:.

> *"Admitted: episode of central chest pain like usual angina. Had been well controlled since CABG until 2/52 ago."*
>
> *(Registrar 07 in Simulated Discharge Letter)*

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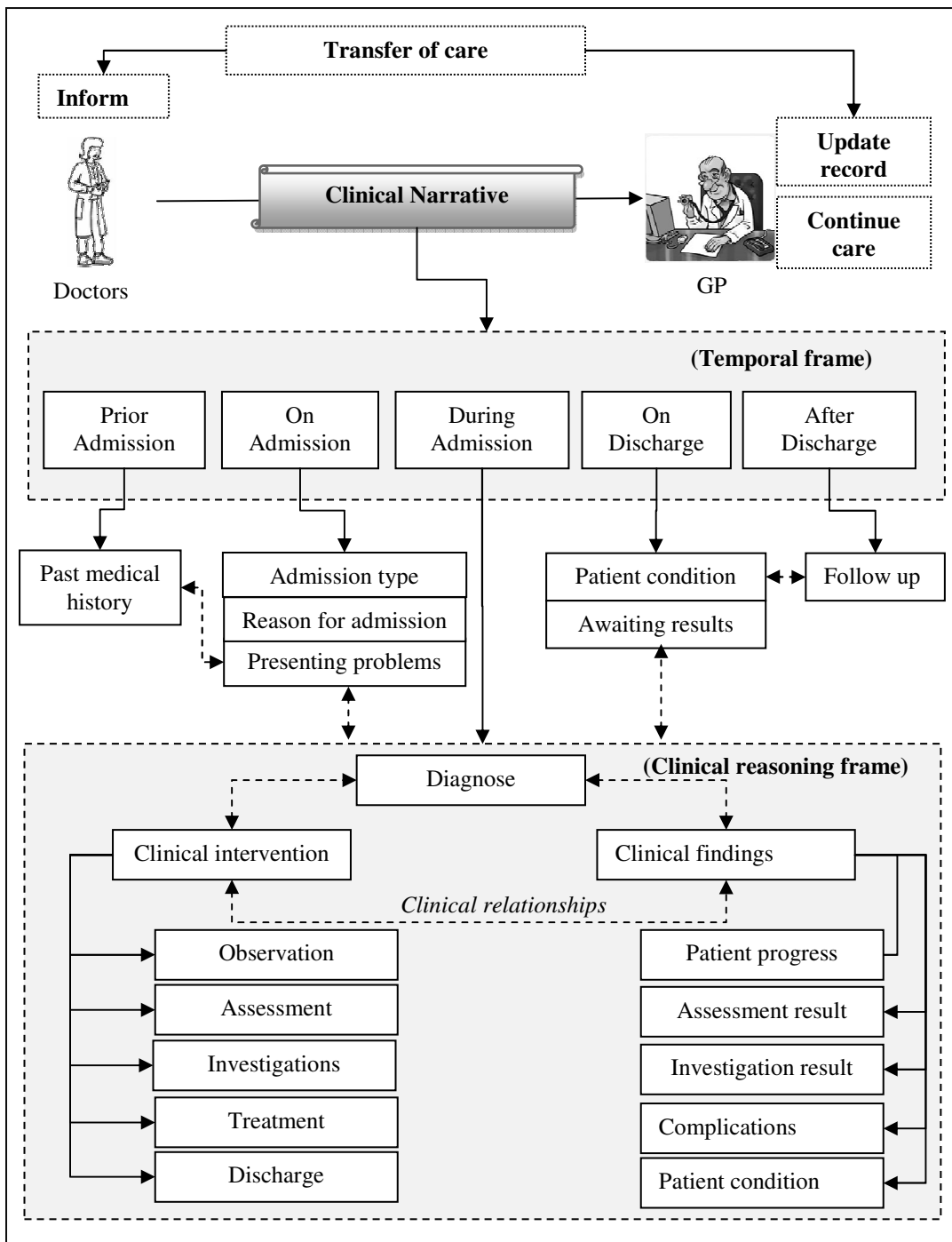
Figure 5.8 Frame model for writing a clinical narrative
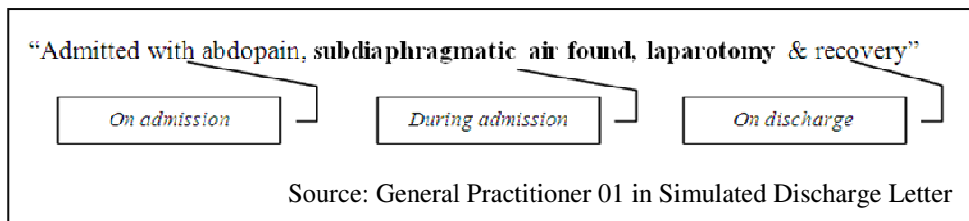
Figure 5.9 Example 1 of temporal frame in the clinical narrative
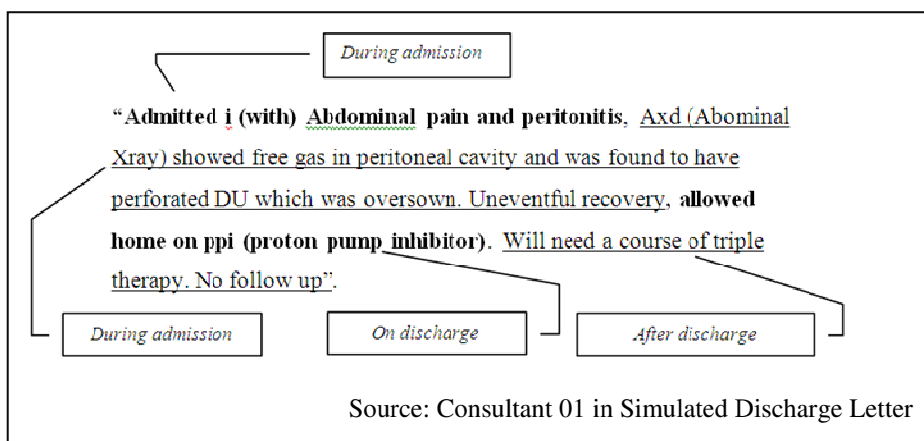
Figure 5.10 Example 2 of temporal frame in the clinical narrative

Alternatively, these two temporal segments can be collapsed into one sentence in order to show the close connection between information within the temporal segments, as shown below:

> *"**Hx (history) of intermittent central chest pain** becoming worse the evening prior to admission."*
>
> *(Registrar 04 in Simulated Discharge Letter, author's emphasis)*

The *"on admission"* temporal segment contains presenting problems and patient conditions such as:

> *"Admitted with central chest pain radiated to both arm and back"*
>
> *(Registrar 09 in Simulated Discharge Letter)*

> *"Sudden onset with leg & arm weakness"*
>
> *(Registrar 05 in Simulated Discharge Letter)*

Additionally the segment may contain information about the type of admission and reason for admission:

> *"Elective admission for left fem pop bypass"*
>
> *(Consultant 10 in Simulated Discharge Letter)*

The *"during admission"* temporal segment has greater variety of information. The segment may contain the information about clinical findings, diagnosis and clinical interventions. The clinical interventions might be observations, assessments, investigations, treatments and the discharge decision. The clinical findings can be about the patient's condition, progress, assessment, investigation results and complications:

> *"Improved slowly on ward"*
>
> *(Registrar 05 in Simulated Discharge Letter)*
>
> *"CK on admission normal"*
>
> *(Registrar 09 in Simulated Discharge Letter)*
>
> *"Axd (Abdominal Xray) showed free gas in peritoneal cavity"*
>
> *(Consultant 02 in Simulated Discharge Letter)*
>
> *"Initially had good recovery but developed pain in wound on."*
>
> *(Registrar 08 in Simulated Discharge Letter)*

The clinical findings from observations and investigations are important to determine the root problem and/or definitive diagnosis, and subsequently the treatment plan. All these pieces of information are likely to be contained in the *"during admission"* segment. Diagnosis can be expressed with different levels of certainty:

> *"Presumed to be cardiac chest pain"*
>
> *(Registrar 04 in Simulated Discharge Letter)*
>
> *"CT confirmed ischemic stroke"*
>
> *(Registrar 05 in Simulated Discharge Letter)*

Any negative clinical findings play a significant role in clinical reasoning and often feature in the clinical narrative. For example the clinical reasoning underlying the clinical finding *"CK on admission normal"* was explained by Registrar 07:

> *"That's a cardiac enzyme which is measured and if that's elevated then that would mean she'd had a myocardial infarction, heart attack. But it wasn't particularly upset so she hadn't."*
>
> *(Registrar 07 in Simulation Interview)*

The treatment can take many forms. Treatments are often described together along with their effects on the patient condition and progress:

> *"Admitted with reduced oral intake + inability to mobilise. **NG feeding for 2/52. CT head involutinal changes. improved with rehab (OT+Physio)"***
>
> *(Registrar 06 in Simulated Discharge Letter, author's emphasis)*

> *"Nocturnal chest pain responded well to **Gaviscon** (also has history of hiatus hernia)**: lansoprazole is added to her current medication** which the pain responded well."*
>
> *(Registrar 09 in Simulated Discharge Letter, author's emphasis)*

Additionally treatments may be related to complications which resulted from a treatment of intervention:

> *"Standard retrograde open cholecystectomy [...] USS (Ultra Sound Scan) organised on [day] after aspiration of 5 mls blood from collections under wound."*
>
> *(Registrar 08 in Simulated Discharge Letter)*

The *"on discharge"* temporal segment may contain the patient's condition or any pending results expected from an investigation:

> *"Once pain free for 24$^{o(hour)}$ → discharged"*
>
> *(Registrar 04 in Simulated Discharge Letter)*

> *"Physio & OT assessment independent at the time of discharge"*
>
> *(Registrar 05 in Simulated Discharge Letter)*

"Result of USS/wound culture not back on discharge"

<div align="right">

(Registrar 08 in Simulated Discharge Letter)

</div>

Lastly, the *"after discharge"* temporal segment is likely to contain follow up information, either follow up attendance as outpatient at the hospital or any request or advice for the GP to follow up:

"Will need a course of triple therapy. No follow up (from consultant)"

<div align="right">

(Consultant 02 in Simulated Discharge Letter)

</div>

"We will arrange echo on OPA. GP needs to follow up; respond to Lansoprazole+Gaviscon."

<div align="right">

(Registrar 09 in Simulated Discharge Letter)

</div>

For the clinical reasoning frame, the most distinctive feature is the clinical relationships between the information as shown in Figure 5.11. The links express the clinical reasoning behind the clinical decisions and interventions during the patient's episode of care. These clinical links are not always expressed explicitly in the clinical narrative. More often the connections/clues are given through the ordering of information in the clinical narrative.

All the illustrations above show that the temporal and clinical reasoning frames are used in writing a clinical narrative about a patient's episode of care. The examples of clinical reasoning relationships provided above are not exhaustive. In reality, multiple linkages between information can occur depending on the complexity of the actual patient case.

Junior doctors often lack the clinical reasoning ability to extract relevant information related to a patient's episode of care:

"The problem is you need a higher level brain to make a discharge summary (clinical narrative in full discharge summary). Usually the houseman is too inexperienced to put it all in perspective."

<div align="right">

(General Practitioner 01 in General Interview)

</div>
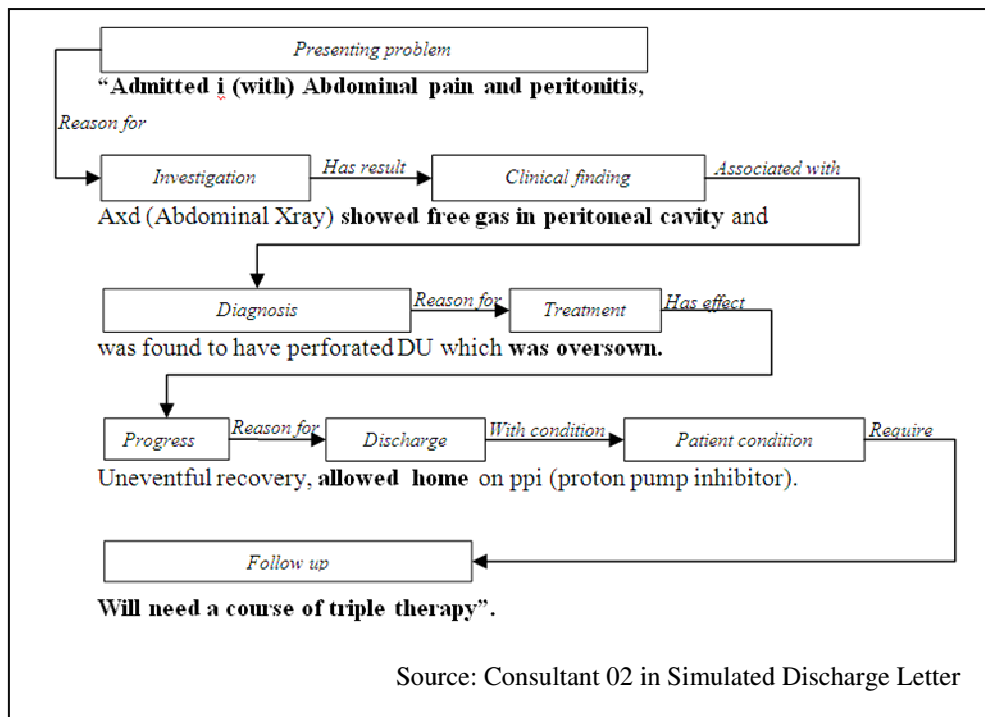
Figure 5.11 Clinical relationships in the clinical narrative

Asking junior doctors to create a clinical narrative ran the risk of either having too much or too little information:

> I: *Do you think the very junior doctor have problem to fill out the*
>   *clinical narrative?*
> R05:   *I think their tendency would be to put lots and lots of them,*
>   *information in there because they wouldn't be able to sort of filter out*
>   *what was actually important, so they would put everything, or do they*
>   *do the entire opposite and put nothing.*
>
> *(Registrar 05 in General Interview)*

Consequently, senior doctors saw themselves as the most appropriate clinicians to write the clinical narrative:

> *"Some of the junior doctors are very clever, they write out all full story in that*
> *paperwork letter, but most of the junior doctors, they can't fill out, so then the*
> *registrar has to do the full, the discharge letter by dictation."*
>
> *(Registrar 09 in General Interview)*

The clinical narrative seems to hold benefits for both the GP and doctor. For the GP the benefit was for retrieving information to update the patient record in the

GP system, in addition to informing the GP of what actually happened to the patient during their hospital stay:

> *"So all the rest is curiosity perhaps. It is what has happened to the patient in their journey, it is a bit of a curiosity, to find diagnosis and because we are going to encode that in general practice and we are going to make any changes to medication."*
>
> *(General Practitioner 01 in General Interview)*

For hospital doctors, the clinical narrative provides a coherent account of the patient's episode of care and clinical reasoning behind the decisions and interventions. This account is important as a summary in the medical records especially if the patient is readmitted to hospital.

5.3.3 External representation semantics

A number of elements in the discharge summary record refer to external representation systems for their actual interpretation and utility. This is particularly applied to some data entry in the discharge summaries such patient home address and patient hospital number (NHS number) in the patient details segment. The focal aspect of this information is on its utility rather than on its meaning.

Figure 5.12 illustrates the signification of the patient's home address. This information is important for correspondence with the patient. The proper interpretation and utility of this information requires a reference to external representation, the postal address register. While this information may not be used directly by clinicians to locate the patient's home, this information is useful to make sure any letters sent out to the patient will reach the right destination. The utility of this information can be augmented by using artifacts such as location address map.
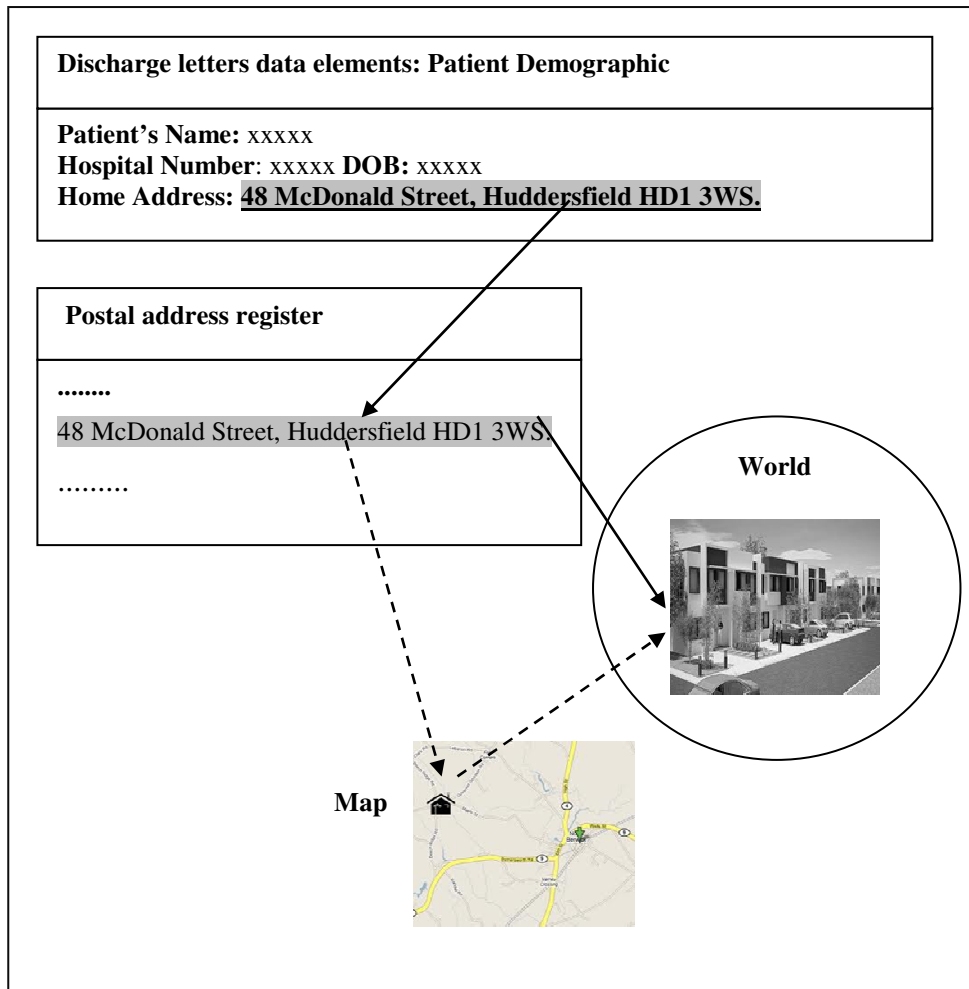
Figure 5.12 Signification to external representation: Patient's address

Another example is the patient's hospital number which is illustrated in Figure 5.13. This number signifies the patient and their medical records in the hospital medical record register. It helps to identify the record for the purpose of routing, access, retrieval and storage. The utility of the information needs to be augmented using medical record keeping systems.
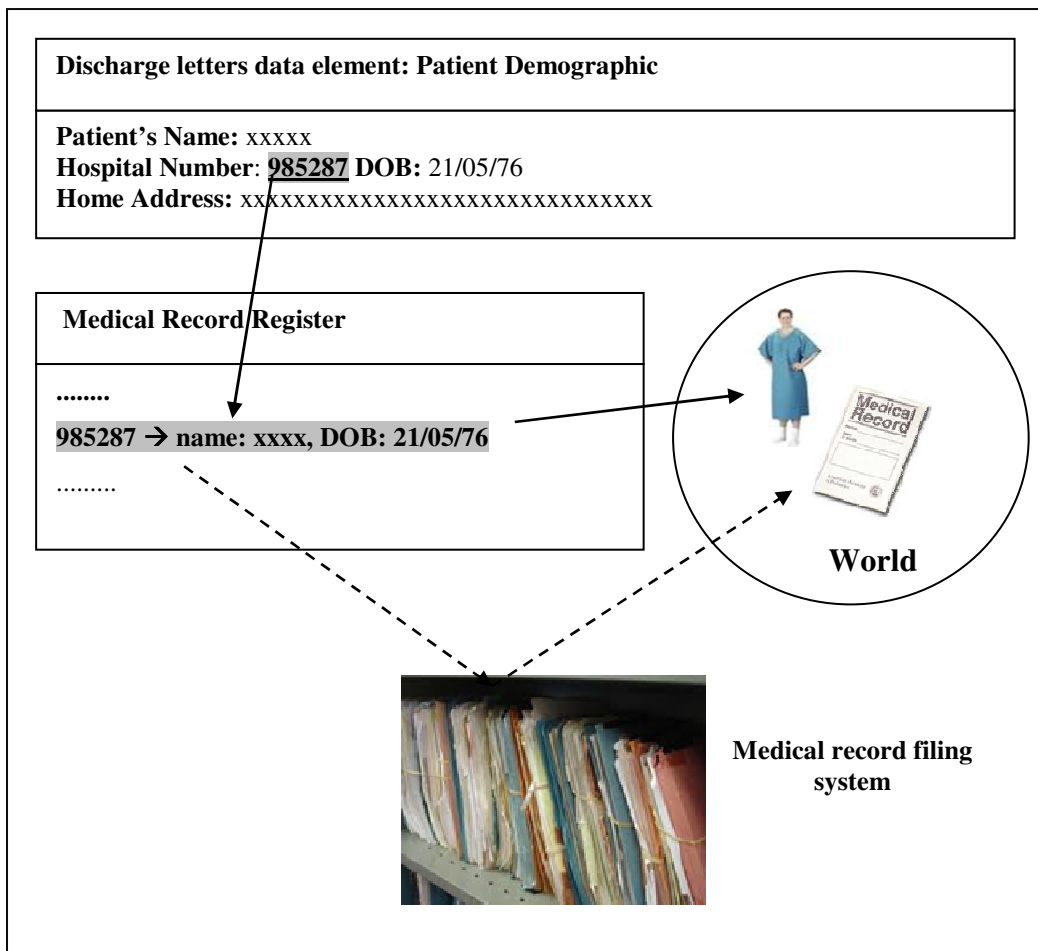
Figure 5.13 Signification to external representation: Patient hospital number

5.4   Syntactic aspects of discharge summaries

Information is communicated using a symbolic representation system, and discharge summaries can be seen as symbolic representations of patient information. Syntactic aspects are concerned with how the symbolic elements are structured and represented in discharge summaries. There are three syntactic elements highlighted in this section: language codes, grammar and presentation style. The discussion focuses on the characteristics of these elements in discharge summaries.

5.4.1 Language codes

Communication requires a code system as an interface. For example, morse code is the interface in telegraph communication. A code system consists of a set of symbolic elements that can be used in communication. Language is the common coding system in human communication. Language may have a range of forms including spoken and written language. A written language coding system is called a lexical system. A lexical system consists of the lexicon, a set of words and phrases with meaning that are organised in sentences. This study found a number of characteristics of lexicon in discharge summaries, which may present a considerable challenge to any attempts to standardise the content and presentation of discharge summaries.

Firstly, discharge summaries seem to be dominated by the use of shortened forms in various segments. These shortened forms include abbreviations, acronyms, special sign characters and special numeric expressions. For example, the data entry for medication administration route in the prescription chart is mostly written using abbreviations such as *"PO", "INH"* or *"S/L"*[9]. Similarly, the data entries for medication frequency also use abbreviations such as *"PRN", "BD"*[10]. Moreover, abbreviations are also used to express investigations and other clinical information such as electrocardiography (ECG) and chest X-ray (CXR), history of (Hx), blood pressure (BP), no known drug allergies (NKDA) – and this is not an exhaustive list.

To present information about time, numeric expressions are used rather than normal language expressions. For example, two days is written as *"2/7"*, while two weeks is written as *"2/52"* and two months as *"2/12"*. Additionally, special characters such as *'®'* may be used to state right laterality, the sign *'↓'* means decreasing and the sign *'?'* articulates uncertainty.

---

[9] PO stands for "Per Os" or via mouth, INH stands for Inhale and S/L stands for Sublingual

[10] PRN stands for "Pro re nata" or as required, BD stands for "bis die" or twice a day.

The other observation is that there is no consistency in using these shortened forms in discharge summaries. For example, within the same discharge summary the expressions *"3 months"* and *"3/12"* may be used. Abbreviations also can be idiosyncratic and unique to individuals. For example, outpatient clinic appointment is abbreviated differently as *"OP", "OPA", "OPD"* or *"O/P"*. Besides shortened forms, the same thing can be expressed with different words and expressions. Two different words and expressions that share the same meaning are called synonyms. Synonyms may also have different syntactic expression. For example *"Duodenal perforation"* is synonymous to *"Perforated duodenum"* but different in morphology of words and grammatical phrasing.

Metonym is another special kind of synonym. It is a contextual synonym where a part of the expression represents the whole expression. For example the expression *"clinic 6/52"* means the same as *"outpatient clinic appointment 6/52"*. In this case, the word *"clinic"* is a metonym of "*outpatient clinic appointment"*.

Lastly, in expressing investigation results doctors adopt different approaches to present the result as raw data or in an interpreted form. For example, for the same patient case, one informant would express the cardiac enzyme test result with *"CK_1 89"*, while another informant would express an interpretation such as *"CK on admission normal"*. Similarly, the blood pressure can be expressed as *"100/50"* or *"low"*.

5.4.2 Grammar

Syntactic grammar is concerned with the structuring and ordering of symbolic elements. The structuring and ordering of elements in discharge summaries is important to support data entry and to guide interpretation. The structuring of discharge summaries involves grouping or dividing the elements of the content into sections. The structuring and ordering can be applied at document and section

level and in the clinical narrative. The following section will describe the
structuring and ordering of elements in each level.

5.4.2.1 Document-level grammar

The construction of TTOs and full discharge summaries use some structure. For
data entry purposes, structure was seen as important:

> *"You need some structure and I think if something like this comes up, I mean
> there is some structure, which is better than just having a blank page and telling
> you just write something."*
>
> *(Consultant 10 in General Interview)*

The structure in the discharge proforma serves as a prompt to make sure important
information is not missed by the person making the data entry:

> *"Well with all of these things it's just generally what gets written on them and
> they have to be structured so that all the important bits of information get put
> in."*
>
> *(Registrar 07 in General Interview)*

The structure is particularly useful for junior doctors who have less experience
about what to write in a TTO:

> *"No, it (structure in TTO) doesn't hinder me, but it is good for junior doctors
> that don't know what they're supposed to be writing."*
>
> *(Registrar 04 in General Interview)*

The challenge is to define a structure that offers fit for the majority of patient
cases. There is unlikely to be a *"one size fits all"*:

> *"You're trying to capture everybody with one form, you can't have a hundred
> forms for a hundred patients. So I think you have to accept that and just fill in
> those things that are relevant to your particular area."*
>
> *(Consultant 10 in General Interview)*

For full discharge summaries, senior doctors also seem to adopt some structure in their dictation and this is unique to individual doctors:

> "Even in the narrative, I have some structure to what I say, yeah. Some people in their narrative actually put much more structure, they will say admitted this date, discharged that date, you know, this diagnosis, you know, people would put, I don't put that structure into it, but I mean I do it sort of sub consciously."
>
> *(Consultant 02 in General Interview)*

> "I mean I've got a structure, I think everyone has a different structure [...] I think so, I always start, the main diagnosis at admission, then other diagnosis the patients might have, then their discharge medications and then, you know, I'd do a paragraph or two paragraphs about, you know, the admission."
>
> *(Registrar 05 in General Interview)*

The structure helps the doctor to dictate the letter concisely; it also helps the secretary to type up the letter later:

> "Yes, there's a pattern to make it easier for the secretaries, ok,"
>
> *(Registrar 04 in General Interview)*

The following section compares the document structure in a range of discharge summaries. Figure 5.14 shows the structure of the case study NHS Hospital Trust's TTO (Figure 5.14a) and Hospital X's TTO[11] (Figure 5.14b). These two proforma have a predefined structure that is used to structure both data entry and output presentation. The heading for each section is named and acts as a prompt for data entry. The data is entered by filling in the available space in each section. The sections in the discharge documents are labelled to aid comparison. In the case study Trust's TTO, section A consists of details of the admission and discharge (A1) and patient demographic data (A2). The next section contains information about the episode of care (B) which can be further categorised into presentation, investigations, progress, diagnosis, complications and follow up arrangements.

---

[11] Hospital X's TTO was provided by the General Practitioner 01 informant and has been anonymised.

(a)   **Case study hospital's TTO**

(from Appendix 8)

(b)   **Another hospital's TTO**

(from Appendix 9)
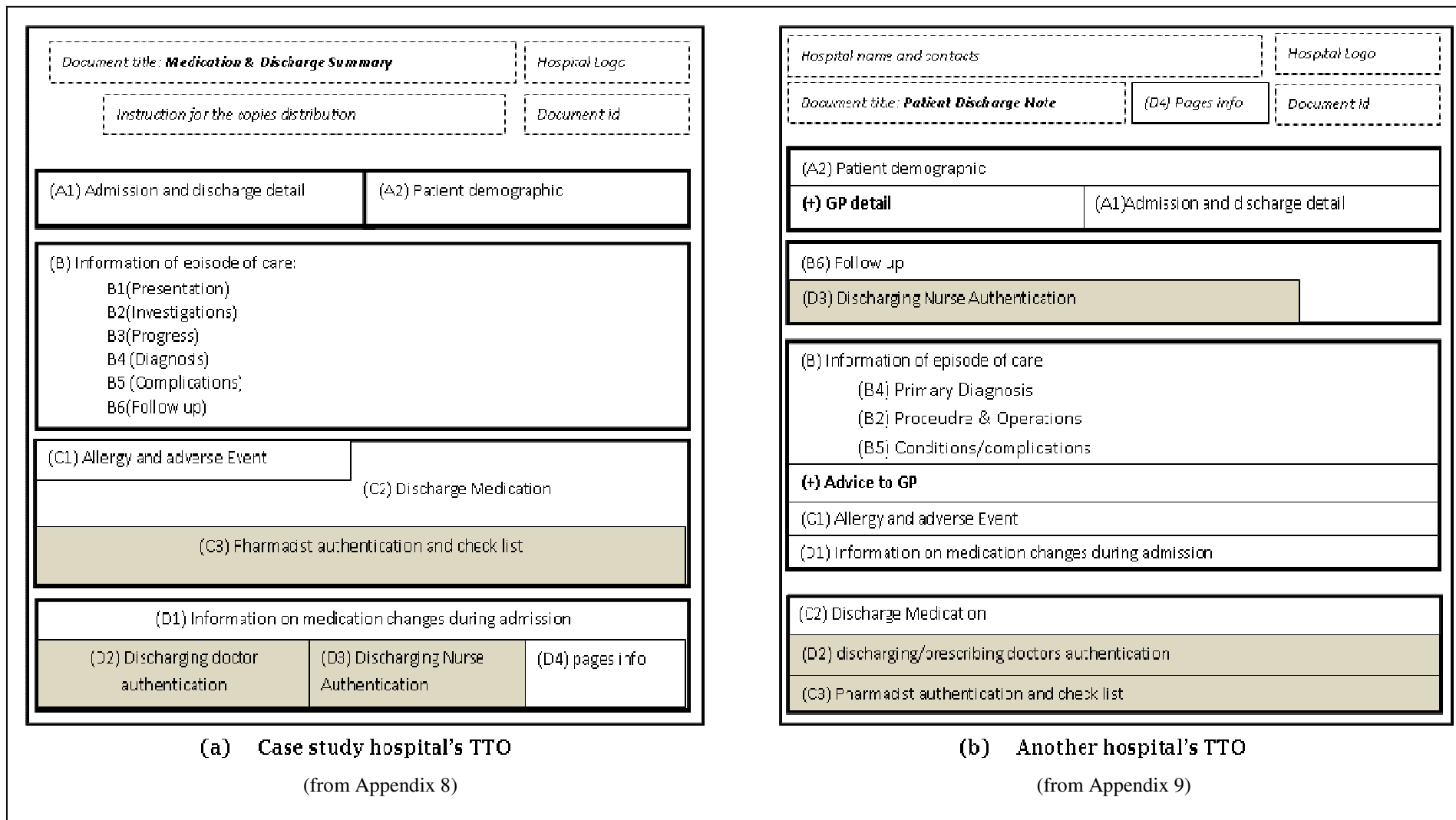
Figure 5.14   Document structure of two different TTOs

Allergy and adverse events (C1), discharge medication (C2) and pharmacist authentication and checklist (C3) are grouped together as a section. The last section contains the information about changes to medications (D1), the discharging doctor's authentication (D2), the discharging nurse's authentication (D3) and pages info (D4). The document header features document artifacts such as document title, hospital logo, document identifier, and instruction for distribution.

A comparison of Hospital X and the case study NHS Hospital Trust's TTO illustrates a number of similarities in terms of content. The only exception is that Hospital X's TTO has extra information such as GP details and advice to GP. The comparison between these proformas shows that while the content of discharge summaries may be similar, the structuring, ordering and layout of the discharge proforma seems to differ significantly between the two organisations.

The TTO and full discharge summary also have different characteristics in terms of document structure. The anatomy of two examples of full discharge summaries is given in Figure 5.15. The full discharge summary also does not have as many parts as the TTO, as these are for pharmacist and nurse authentication data. This is not relevant in a full discharge summary. The full discharge summary would not normally repeat some of the information in the TTO such as supply quantity of discharge medications.

The distinctive feature of a full discharge summary is the presence of a clinical narrative. The clinical narrative contains information about an episode of care presented in a story telling format. Apart from the clinical narrative, the other elements of the full discharge summary are likely to be more structured. The process of dictation does not seem to hinder individual doctors in providing a structure.

(a) Registrar 04's full discharge summary

(From Appendix 10)

(b) Patient case 01-029's full discharge summary

(From Appendix 11)
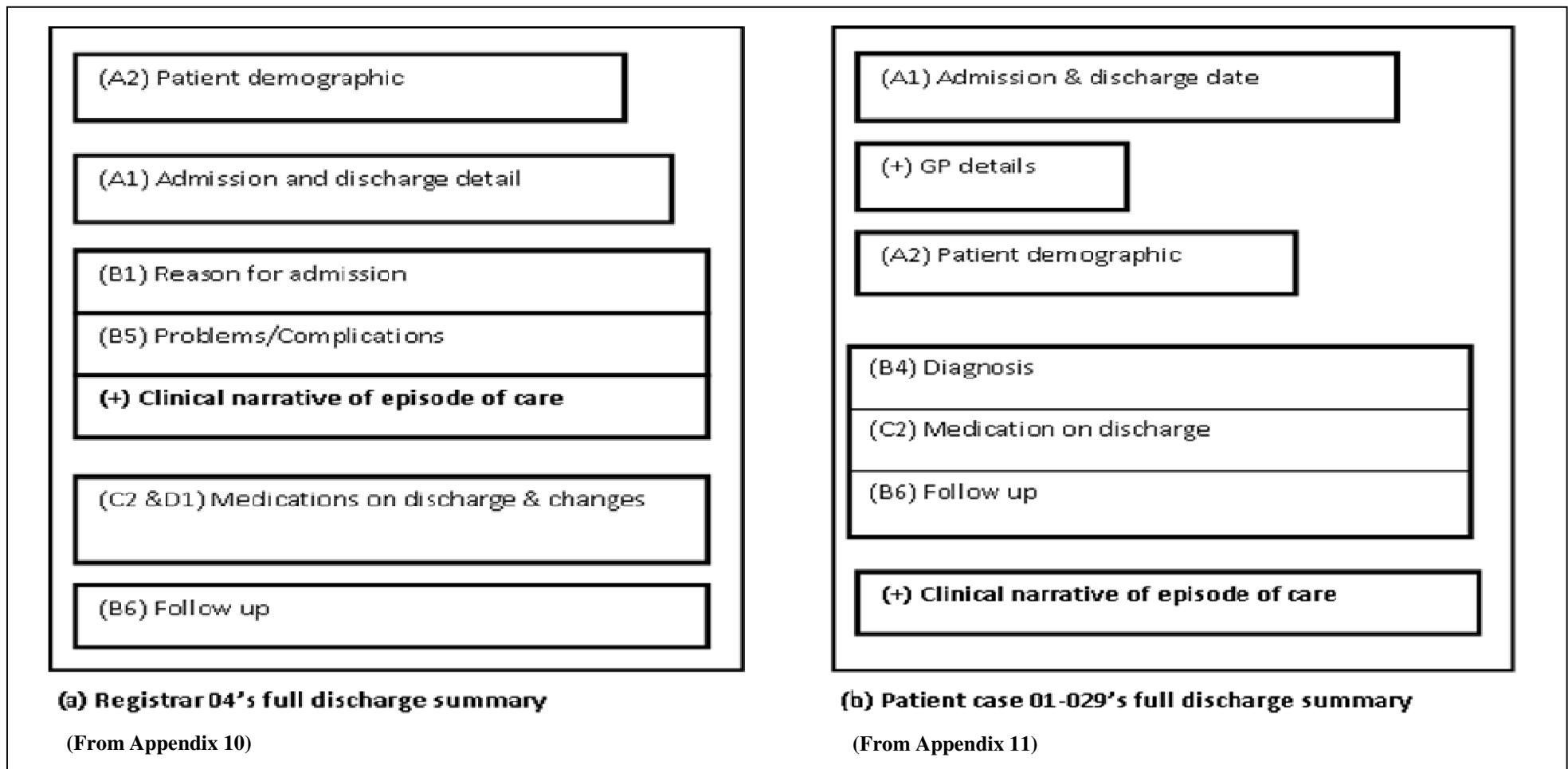
Figure 5.15 Document structure of two full discharge summaries

Lastly, the layout of full discharge summary and TTO significantly differs, by comparing the document structure in Figure 5.14 and Figure 5.15. A TTO is designed for data entry and seems to maximise the utility of space available. The full discharge summary does not have that kind of requirement. The information is more likely to flow as paragraphs without pre-named headings and boxes to segregate sections..

5.4.2.2 Section-level grammar

Each section in discharge summaries can be further structured. The structuring inside a section can be based on either a categorisation process or an attribution process. In an attribution process, all substructures represent the detailed attributes of a particular type of information or entity. In a categorical process, information in a section, or subsection, is partitioned into distinct categories.

For example, the admission and discharge detail and patient demographic data have attributive structures. The patient demographic section is structured into attribute elements such as patient name, NHS names, date of birth and home address. Similarly, the admission and discharge detail is structured based on the relevant attributes such as hospital and ward location where the patient is admitted, the date of admission and discharge, the consultant responsible for the patient's episode of care and the discharge destination, or address. Attributive structuring is also used in the structuring of information about discharge medication and any medication changes. The discharge medication items are structured based on attributes such as drug and form, dose, direction, duration of treatment and supply quantity. For medication changes, the information is structured based on attributes such as drug, type of change (started or stopped) and reasons for changes.

Categorical structuring seems to be applied to the clinical information section in the TTO proforma, which normally contains information about a patient's episode

of care. The information is structured into categorical segments such as presentation, investigation(s), progress, diagnosis, and complication and follow up arrangements. However, this structuring misses the temporal and causative/clinical relationships that bind the information as a coherent piece of clinical reasoning. Categorical structuring makes it easier for junior doctors to fill out the TTO proforma. However, this structure may not be sufficient to convey the *"story"* about the patient's episode of care to the GP. In order to remedy the limitation of clinical information in the TTO, the full discharge summary, delivered later on, structures the clinical information in narrative, which exhibits the temporal context and clinical relationships across the information. A similar approach is attempted in the design of the RCP discharge proforma by providing a section for writing a clinical narrative.

5.4.2.3 Clinical narrative grammar

The clinical narrative is a distinct section in the RCP discharge proforma that is not used in the case study NHS Hospital Trust's TTO proforma. The clinical narrative consists of sentences grouped into paragraphs. This is a formal structure of any text that is longer that one or two sentences. The main interest in this study is the overall structure of a clinical narrative. Senior doctors, when writing a clinical narrative, appear to use a temporal and clinical reasoning frame. A temporal frame divides the information into chronological parts. A clinical reasoning frame links the information into causative or other clinical relationships. Hence, the narrative presents the reasoning underlying the interventions administered during a patient's episode of care.

The narrative focuses on the connections between the information rather than the category of the information. The ordering of the information seems to infer linkages without any necessity of verbalising the relationship explicitly. Expressing the information as a sequence of sentences seems to allow flexible ordering. In contrast, in the TTO proforma, the clinical information of a patient's

episode of care has been outlined into categorical sections. This does not allow flexible ordering of the information. A clinical narrative format may be less structured, however, it offers greater flexibility and expressiveness to describe complex relationships between clinical information concisely.

The structure of a clinical narrative seems to include both temporal structuring and causative/clinical relationship ordering. The clinical narrative written by Consultant 02 (see Figure 5.11) offers an example of clinical relationship ordering. In the illustration, the clinical narrative structure presents clinical reasoning in a chronological sequence.

In another example, shown in Figure 5.16, the information in the clinical narrative was presented chronologically; the patient's progress is written immediately after explaining the presenting problems; no treatment information is provided.

Source: Registrar 05 in Simulated Discharge Letter
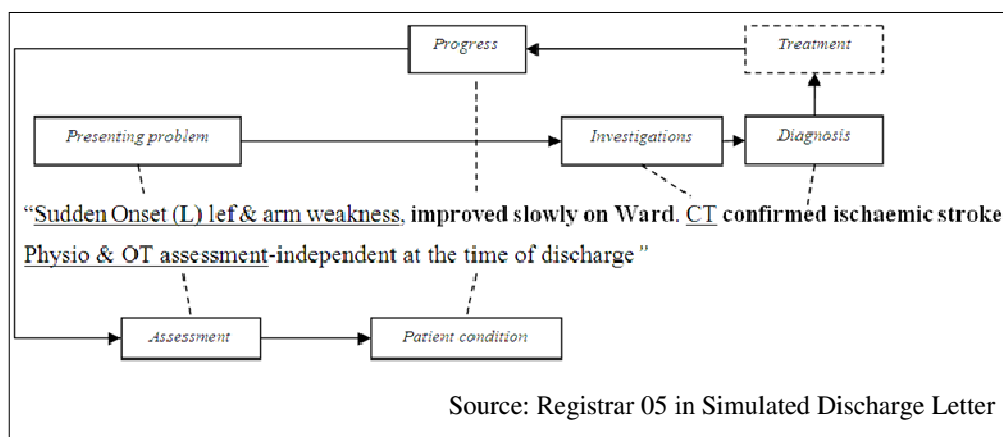
Figure 5.16 Example of clinical linkages in the clinical narrative

Some informants, such as Registrar 04, preferred to describe patients' presenting problems in the structured section of her full discharge summary. Her clinical narrative would normally start with what happens to the patient during the admission. A clinical narrative may also contain information about diagnosis, clinical findings and interventions.

Figure 5.17 shows other examples of clinical findings description in the clinical narrative. These examples show that each clinical narrative infers a different information structure that is not always possible to extract without an understanding of medical science and terminology. This illustrates the challenges for developing computer applications that could accurately extract information from a clinical narrative. The idiosyncrasies of individual clinicians in writing the clinical narrative makes the task even harder.
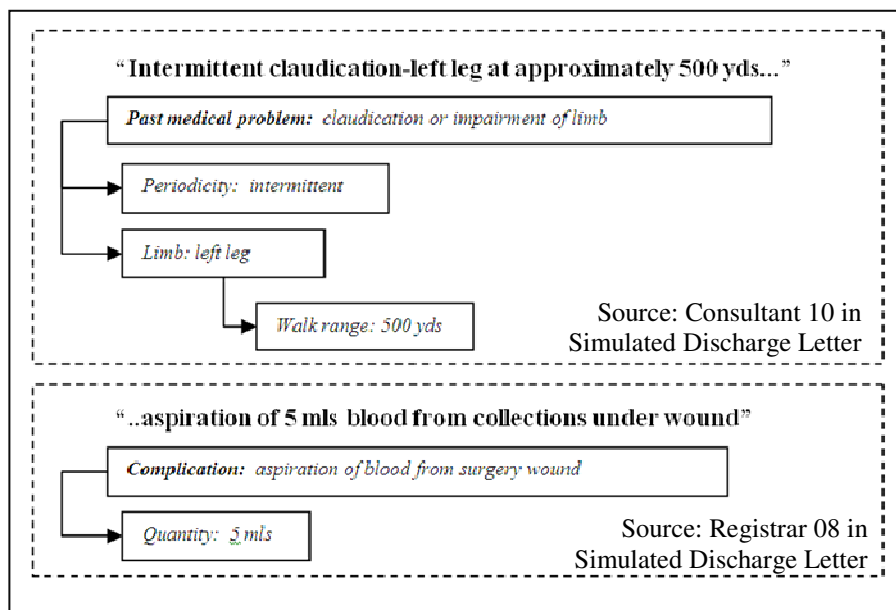
Figure 5.17 Example of description of clinical findings

5.4.3 Presentation style

The next syntactic element is presentation style. The way in which something is presented will influence how the reader perceives the information and the ease of assimilation of the information in discharge summaries. Presentation style can help the reader to read and to understand information more speedily. Presentation style can make the discharge summaries more usable.

Firstly, the presentation style of discharge summaries seems to be influenced by how the document is designed for data entry, as with the TTO, or for ease of reading as with the typed full discharge summary. The presentation style of the TTO is dominated by box, line, and checkbox and heading name to aid data entry.

The data entry method for completing a full discharge summary is dictation. The information is typed up for ease of reading. The guiding lines and checkboxes, which are normally present in TTOs to assist data entry, are not present in full discharge summaries. While different sections in the TTOs are partitioned using boxes, lines and tables, the full discharge summary uses special characters, e.g comma, semicolon, tabs, or empty spaces.

Secondly, the characteristics of the input data also influences presentation style decisions. These include cardinality, composition and value range of the input data. The cardinality, or multiplicity, is the number of input items. For example, the patient's name has exactly one (1) cardinality, while discharge medications have zero to many ($0..n$) cardinality. The composition indicates the elements of the input data. The value range specifies the possible values for the input data.

These data characteristics influence how information in discharge summaries should be presented. For example, the medication prescription on discharge may have multiple medication items and each item has a similar composition of data. In a TTO, a tabular format is appropriate to present this information in order to assist both data entry and reading. However, in the full discharge summary where the information is dictated and typed, using a tabular format will be time consuming. Instead, most full discharge summaries will just use a comma or other special character to segregate the medication items, as shown in Figure 5.18.
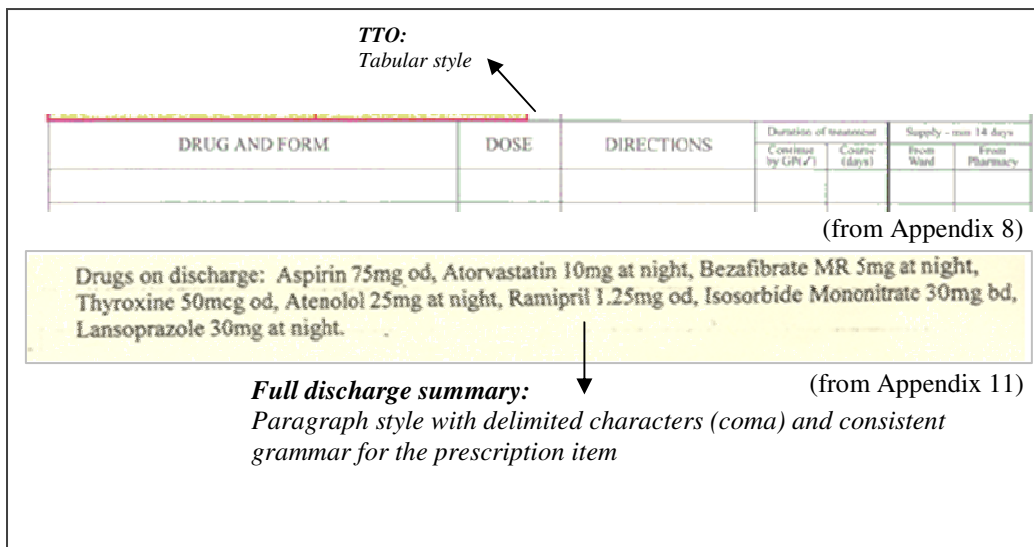
Figure 5.18 Presentation style for medication element

The value ranges of the input data may also influence presentation style decisions. If the value ranges of the input data can be enumerated with few choices, the data entry can be speedier if choices are presented with a checkbox.

The individual entering the data merely needs to tick the checkbox rather than entering input data. For example, the presentation style for follow up arrangement in Hospital X's TTO follows this presentation style as shown in Figure 5.19.
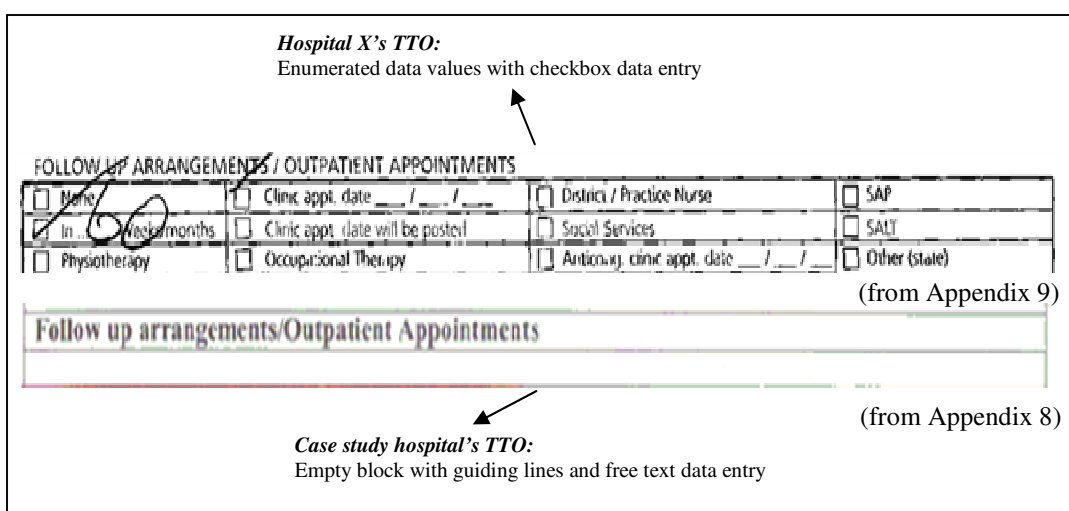
Figure 5.19 Presentation style for follow up arrangement

Lastly, presentation style can be used to highlight or emphasise, and thereby draw the attention of the individual entering the data. This is done to ensure compliance with data entry. For example, in the case study NHS Hospital Trust's TTO, the section for allergy and adverse reactions information is presented with contrasting colours to draw attention to it as shown in Figure 5.20. This example is an illustration of the presentation style of a discharge summary. Presentation is a component of usability and beyond the scope of this study.

(from Appendix 8)

Figure 5.20 Presentation style of allergy and adverse drug reactions

5.5 Summary

In order to explore various aspects related to the construction of discharge summaries, this part of the study has adopted a semiotic conceptual framework, and the discharge summaries are analysed in terms of pragmatic, semantic and syntactic aspects. This interrogation of pragmatic aspects revealed that discharge summaries serve multiple functions and purposes. The content and presentation of discharge summaries are also influenced by various factors related to the author, patient and data entry system.

Semantically, the information in discharge summaries can be interpreted within the context of interaction between health professionals in relation to patient discharge. Within this perspective, the author of a discharge summary can be seen

as performing action through information in the discharge summary. Moreover, hospital doctors seem to use a number of different mental frames in constructing a discharge summary. These include mental frames for prescribing and dispensing medication, reconciling patient's ongoing medication, coordinating follow up, writing a clinical narrative, and completing patient, admission and discharge details. Each mental frame represents a subtask in constructing the discharge summary.

This study found the syntactic characteristics of discharge summaries might cause a significant challenge for standardisation. Hospital doctors appear to use a range of shortened forms in completing a discharge summary. Moreover, the structuring of a discharge summary seems to be idiosyncratic and varies significantly between individual doctors and organisations. The clinical narrative has distinctive characteristics compared to other data entries in discharge summaries. Writing clinical narratives was claimed to require medical experience and knowledge to be able to extract and link clinical information associated with a patient's episode of care. The ability to write concise clinical narratives is associated with the clinical reasoning ability. Clinicians seem to employ both temporal and clinical reasoning frames in writing a clinical narrative. Lastly, the information ordering in the clinical narrative has the flexibility to describe concisely different information structures and also relationships between different information. However, the reasoning with this form is highly contextual, which would make it hard for a computer application to extract the information structure and the implicit relationships between information from clinical narratives.

CHAPTER 6 DISCUSSION

6.1 Introduction

This study aimed to gain a better understanding of various aspects related to the construction of discharge summaries and the implications for improving discharge summary systems. In order to achieve this aim, this chapter draws together the findings from Chapter Four and Five, and discuss them in relation to current knowledge in order to demonstrate the contributions to new knowledge. The discussion is structured around ten specific themes or key findings. The implications of these findings for improving discharge summary systems are then explored in the subsequent section. The final section presents a summary of contributions to new knowledge of this doctoral study.

6.2 Discussion of key findings

This study identified ten key findings that expand the current understanding of various aspects related to discharge summaries. The following ten subsections discuss these key findings.

6.2.1 The medical orientation of discharge summaries

> *The content of a discharge summary appears to be limited to medical concerns of the patient's ongoing care*

While a patient discharge is a multidisciplinary process (Rooney, 2010), this study found that the content of a discharge summary was often limited to the medical concerns of the patient's ongoing care. This limitation was not reported in other studies, which often failed to recognise the significance of the multidisciplinary aspects of the patient's ongoing care. Even the recent initiative to provide a standard structure for discharge summaries was also biased towards this medical orientation (Carpenter and Bridgelal Ram, 2008a, b). This implies that the current discharge summary is not a holistic documentation of a patient's episode of care

in hospital and their follow up arrangements, and this can be problematic for some patients, especially those with complex problems.

The medically orientated authorship of discharge summaries can be seen as the consequence of the advent of speciality and multidisciplinary approaches in modern healthcare services. In this study, hospital doctors often assumed that the transfer of responsibility of non-medical aspects of the patient's care was not their concern, and therefore was not part of the discharge summary. The responsibility for transfer of these aspects was assumed by a nurse, often without any written records. This fragmentation of patient care increases the complexity of patient discharge (Mukotekwa and Carson, 2007). In this study, hospital doctors perceived that GPs were not interested in information related to nursing and supporting care for the patient. This contradicts the evidence that GPs were indeed interested in this information (Wills et al., 2011). In the hospital care setting, the management of the multidisciplinary aspects of a patient's care is coordinated through MDT meetings, while in primary care the management of the patient's care is coordinated by the patient's GP in liaison with other community health professionals, normally by telephone. The different coordination approaches to the patient's care may have contributed to the hospital doctor's misconception. The considerations to the multidisciplinary aspects of the patient's care were seen as criteria for good clinical records (Scott, 2004), and the absence of this perspective in discharge summaries may cause difficulties for GPs, who are responsible for coordinating the patient's care with other community health professionals (Stille et al., 2005).

The *"nurse-led discharge"* initiative and its early adopters appeared to bring a more holistic nuance to the content of a discharge summary, but this was limited to *"simple"* cases and certain groups of patients (Department of Health, 2004a; Lees, 2004; Office for Public Management, 2010).

6.2.2 The attitude of senior doctors

> *Senior doctors showed a low level of availability, priority, and accountability to ensure that high data quality timely discharge summaries were produced timely*

Various findings in this study indicate that senior doctors demonstrated a low level of availability, priority and accountability to ensure that high data quality discharge summaries were produced in a timely manner. The indications include the tendency to delegate the completion of TTOs to an available junior doctor, most often without any supervision or further validation. The completion of the full discharge summaries was often seen by senior doctors as less important compared to the other commitments.

The lack of medical evaluation, guidance, and the level of experience of the author have been reported in other studies (Frain et al., 1996; Kazmi, 2008). However, the intricacy of the senior-junior doctors working relationship and the attitude of senior doctors in regard to the completion of discharge summaries are an under researched area in the academic literature. Interestingly, the phenomena described above was reported in a popular article:

> *"I gather that the problem is that consultants and registrars are too high and mighty to do the chore of writing these summaries. They delegate the task to junior doctors, who may be covering the patients of several consultants, and who may not actually know the patients they are writing about. It is not surprising that the resulting summaries are garbage."*

> *(Vinegar, 2010)*

This account shows that the issue with the senior doctor's availability, priority, and accountability to undertake discharge summaries may not be unique to the case study NHS Hospital Trusts. This finding also confirms the tendency of hospital doctors to treat discharge summaries as a personal rather than a corporate asset that needs to be created according to an accepted standards (Pullen and Loudon, 2006).

6.2.3 The status of TTOs

> *TTOs were considered inconsequential; a smoke screen for NHS Hospital Trusts*

The two discharge summaries approach, with the TTO and full discharge summary, was a ubiquitous practice (Kripalani et al., 2007). The introduction of TTOs was an attempt to solve the problem of delayed discharge summaries, where full discharge summaries were often received one month after the patient discharge. With the introduction of TTOs, the delay was cut down to one week. Giving a copy of the TTO to the patient, GPs can access the information in the letter at the time the patient sees them, which is normally one to three days after the patient discharge (Kripalani et al., 2007). Despite above interventions, the delay in receiving discharge summaries continues to be an issue amongst GPs.

This study found that the fundamental issue is not how quickly TTOs can be delivered to GPs. In reality, TTOs were considered inconsequential by both hospital doctors and GPs. The practice of senior doctors delegating the completion of TTOs to junior doctors without any prior training, supervision, or further validation, despite the wide recognition of their lack of experience and competence reinforces the insignificant status of TTOs. The data quality of TTOs was often acceptable (Kripalani et al., 2007). This problem outweighs the benefit of being delivered much sooner than the full discharge summaries. The carbon-copy technique used in making the copies of the TTO often results in illegible copies. All these problems appeared to influence the GP's perception of the insignificant status of TTOs. In this study, the GP informant referred to TTOs are *"a half way house"* and *"don't read them more than as a rule"*. For GPs, speedy delivery of the full discharge summary, ideally within three days after the patient discharge, is more important. This finding indicates that the current custom and practice of completing TTOs could be acting as a smokescreen leading to organisational ignorance. Thus at best, a TTO is simply notifying the GP that the

patient has been discharged from hospital, but this could be achieved by a single telephone call or email by the nurse responsible at the time of the patient discharge.

6.2.4 NHS Hospital Trusts' accountability issue

> *NHS Hospital Trusts demonstrate a lack of accountability and insufficient commitment to improve discharge summaries*

Overall, the findings of this study demonstrated the lack of accountability and insufficient commitment of NHS Hospital Trusts to improve their performance in achieving high data quality and timely discharge summaries. This phenomena may vary across different NHS Hospital Trusts. One of the indications is the absence of any policies or a regulatory approach for ensuring *"best practice"* when completing discharge summaries.

Poor data quality and delayed discharge summaries were associated with the risk of hospital readmission, which increase hospital work load and the overall healthcare costs (Van Walraven et al., 2002; Jencks et al., 2009; Clark, 2010). A commitment to achieving a better discharge summary system requires NHS Hospital Trusts to make an initial investment and to change the current practice of hospital doctors in completing discharge summaries. With all these difficult requirements, NHS Hospital Trusts appear to have a low motivation to proactively improve their performance in this area. Making these changes is problematic and compounded by the lack of information governance, policy, legislation, incentive and enforcement by the NHS central authority in the past.

There is a requirement for the practice of clinical record keeping to comply with the Records Management: NHS Code of Practice (2009); a guidance document published by the Department of Health (England) as part of Information Governance (IG) of NHS services (Department of Health, 2006, 2009). Moreover,

NHS Hospital Trusts are now obliged to deliver a discharge summary within 24 hours after a patient discharge (Department of Health, 2008), and NHS Hospital Trusts are only able to achieve this by implementing the electronic discharge summary. Health professional authority bodies have also produced standards for the content and best practices of discharge summary record keeping (Carpenter et al., 2007; Carpenter and Bridgelal Ram, 2008a, b).

Healthcare providers have been slow to comply with these new legislations and standards. This issue of slow progress may be addressed by the introduction of the recent Quality, Innovative, Productivity and Prevention (QIPP) initiative that attempts to bring a greater scrutiny on the quality of NHS services (Department of Health, 2010). Alongside this initiative, the introduction of GP commissioning services from the NHS Hospital Trusts may mean GPs are able to influence the current hospital practice associated with the completion of discharge summaries. NHS Hospital Trusts may have to take serious actions to improve their practice of completing discharge summaries.

6.2.5 The impact of clinical narrative writing skill

The experience of writing, or dictating, clinical narratives appears to improve doctor's ability to filter out irrelevant information and to write a concise TTO

Most of the registrar informants in this study claimed that they wrote a more concise TTO and were able to filter out irrelevant information once they started regularly dictating full discharge summaries. The findings in this study suggest that completing more TTOs, without any supervision and/or feedback, does not improve junior doctors skills to write better TTOs; they tend to put either too much irrelevant information or very less information.

This finding shows that the cognitive process of structured data entry essentially differs from that of writing a clinical narrative. In this study, the clinical narrative

written by senior doctors was characterised by a mixture of temporal structuring and clinical reasoning in order to provide a coherent *"narrative"* of the patient's care journey and their follow up care plans. These features do not exist in structured proformas such as TTOs. Consequently, junior doctors who complete TTO do not need to justify the coherence of information they record in the TTOs, and any irrelevant information is merely a distraction for GPs. Thus, GPs' preference to structured format for discharge summaries needs to be supported by sufficient expertise in the authorship, and the clinical narrative writing skill can help junior doctors to achieve the required expertise.

Sharda et al. (2006b) stated that the ability to write and comprehend clinical narrative was an expert matter. Without any prior training, feedback, and supervision, junior doctors may have problems mastering the skills required to write a good clinical narrative. Interestingly, the RCP discharge proforma consists of a clinical narrative field, and junior doctors need to complete this field. Without any prior training, feedback, and supervision, junior doctors are more likely to have difficulties writing a proper clinical narrative and that this will significantly increase the time required for the data entry.

6.2.6 Consequences of communication and coordination deficits

Three consequences were identified as the result of deficits in communication and coordination between secondary and primary care

Communication and coordination across different care settings are often problematic (Weinberg et al., 2007), and a specific example of this is the interactions between hospital doctors and GPs in regard to the patient's continuity of care. The lack of two way, or interactive, communication between hospital doctors and GPs, and the absence of an explicit coordination mechanism to follow up the patient's care are the main contributory factors (Kripalani et al., 2007; Weinberg et al., 2007; Wandsworth Local Involvement Network, 2010). While

GPs were receptive to the idea of two way communication approach (Wills et al., 2011), this study indicates that hospital doctors would perceive the approach as interruptive and intrusive.

From a patient's perspective, the deficits negatively influenced clinical outcomes, resulting in conflicting information, confusing for the patient, and dissatisfaction (Gerteis, 1993; Cleary, 2003; Weinberg et al., 2007). The deficits also contribute to the hospital doctors' lack of understanding of the information expected by GPs, and this impacts on the data quality of discharge summaries (Branger et al., 1995; Farguhar et al., 2005). This study identified three other consequences of the deficits in the communication and coordination between secondary and primary care providers.

Firstly, the deficits in the communication has a direct impact on hospital doctors perceptions of the significance of discharge summaries, and their motivation to create complete and accurate discharge summaries. This is illustrated in the following account:

> *"You see my main concern is I don't actually know whether GPs read these summaries. I think often you write them, they get filed in the patient notes by the staff in the thing, I don't think they're all read the moment they arrive at the GP's surgery."*

> *(Registrar 05 in General Interview)*

Secondly, hospital doctors increasingly engage the patient in follow up coordination as a consequence of the failure of the communication and coordination between hospital doctors and GPs. The patient is used as the message bearer or the trigger for achieving follow up objectives:

> *"Often we write instructions for the GPs to check the blood in two weeks to ensure renal function's ok, so I'm not sure whether that actually ever gets done. I mean often we'll give the patient a card and say take this to you GP practice, so there's a trigger to get their bloods checked."*

> *(Registrar 05 in Simulation Interview)*

This practice meant the information given to patients was as highly regarded by GPs, as the content of TTOs was often unreliable and incomplete, and the full discharge summary was much delayed. However, with this informal approach there appears to be potential for errors and omissions, and thus may compromise patient safety.

Thirdly, the deficits often contributed to confusion about when the GP should receive the responsibility for the patient's care as hospital doctors are often still involved in the patient's ongoing care after discharge. In this study, GPs appeared to wait until hospital doctors withdraw totally from the patient follow up before they resumed their responsibility for the patient's care. In the past, as informed by the GP informant, on the receipt of notification of a patient discharge from inpatient care, a GP may visit the patient at home. This practice, which may be better for patient safety, has ceased to be part of the routine in current primary care services.

6.2.7 The contextual factors of discharge summaries

> *The features of a discharge summary are influenced by the scope of the functionality, the characteristics of the patient case, the authorship and data entry system used*

The features of a discharge summary are influenced by many contextual factors. This study identified some of these, such as the scope of the functionality, the characteristics of the patient case, the authorship and the data entry system used.

Clinical records may serve different purposes and functions (Scott, 2004; Pullen and Loudon, 2006). This study found that different discharge summaries may require a different set of functionality. TTOs were used for ordering prescriptions and to notify the GP about the patient discharge, but this was not the case with the

full discharge summaries. In addition to being a letter to the GP, the full discharge summary was also a medical record of the patient's episode of care, which serves as an *"aide memoire"* for hospital doctors. One of the implications is that a discharge summary may contain information that is not necessarily relevant for GPs. For example, the clinical narrative in a full discharge summary is important as part of the patient's medical record for hospital doctors. In this study, the clinical narrative was just a matter of *"curiosity"* for the GP informant. This study demonstrated that the significance of different types of information in a discharge summary can be traced back to the intended functions of the discharge summary.

Intuitively, the content of a discharge summary will vary between patients and is influenced by the individual style of the author. This study found that the type of admission, the length of stay, and patient's risk/problem profile were the significant factors that contribute to the variation. Other contributing factors related to authorship included the seniority and medical speciality of the discharge summary author. The clinical narrative writing skill was also shown to influence the ability to write concise discharge summaries.

The formatting and data entry systems are known to influence the legibility, completeness, expressivity and usability of discharge summaries (Van Walraven et al., 1998; Wyatt and Wright, 1998; Van Walraven et al., 1999; Mann and Williams, 2003; Los et al., 2005; Bleeker et al., 2006). This study suggests that the electronic data entry has two distinctive advantages, which are not available with paper or dictation data entry. Firstly, the electronic data entry allows the separation of structure for data entry, data representation, and data presentation. Conflating the structure for these different areas often results in deficiencies.

Secondly, the electronic data entry has the capability to control user behaviours in data entry. These two advantages are crucial for improving the current discharge summary systems. Paper based discharge summary systems do not have the ability to control user behaviours in data entry. This may explain the low effectiveness of

the intervention of introducing standard proforma in many Hospital Trusts. It also explains the hospital doctors scepticism toward the use of the standard RCP discharge proforma (Carpenter and Bridgelal Ram, 2008b).

6.2.8 The interactions through discharge summaries

> *Speech Act and Mental Frame theories are useful to explicate the intended interactions between health professionals through discharge summaries*

Speech Act theory is used in the HL7 formalism to capture the intentional semantic of clinical information, and expressed as moodCode attributes of HL7 classes (Schadow et al., 2000; Schadow et al., 2001). Inspired by this, Speech Act and Mental Frame theories were used in this study to explicate the intended interactions between health professionals through discharge summaries and the required semantic structure to support the interactions.

This was a novel approach, and its replication to analyse other type of clinical documentation is indicated. This approach not only provided a better understanding of how different information in a discharge summary were related, but also it was useful for identifying the potential issues with the current structure and format of discharge summaries. For example, the prescription information in TTO is formatted mainly to support pharmacists to accurately dispense the patient's take home medication supply. However, the inclusion of this information in a discharge summary also informs the GPs about the patient's most current medication, and to assist them to update the patient's medication record in the GP system. The current prescription format does not appear to fit this purpose. Moreover, the analysis of the follow up information explicated the different scenarios that require further actions from the GP, and this will help to structure and format a discharge summary in ways that are useful for GPs.

6.2.9 The different mental tasks in completing a discharge summary

> *Completing a discharge summary requires the author to switch between different mental tasks*

Current attempts to rectify the deficits of discharge summaries focus on achieving agreed content and structure for a discharge summary (Carpenter and Bridgelal Ram, 2008a, b). This structure subsequently needed to be implemented in the data entry system. The understanding of cognitive process involved in completing discharge summaries is crucial for developing fast and usable data entry systems (Dick, 1997). Unfortunately, little has been written about the cognitive process involving in completing as discharge summary.

In this study, hypothetical mental frames were developed in order to explain the relationships between different types of information in discharge summaries from the perspective of the cognitive processes of the interacting health professionals. The results from this experiment suggests that completing a discharge summary involves switching between different mental tasks, including prescribing and dispensing the patient's medication supply, reconciling the patient's ongoing medication, coordinating follow up care and writing a clinical narrative. Each mental task requires a separate semantic structure to accomplish the task. This understanding is an important when designing a usable and effective discharge summary data entry system. Better usability can achieved by aligning the structure of data entry (external representation) with the mental tasks and cognitive structure (internal representation) of the interacting health professionals (Wyatt and Wright, 1998; Horsky et al., 2003).

6.2.10 The use of shortened forms in discharge summaries

Discharge summaries are characterised by excessive use of various kind of idiosyncratic shortened forms

The use of shortened forms such as abbreviations and acronyms was very common in clinical practice and data recording (Pullen and Loudon, 2006; Sheppard et al., 2007; Parvaiz et al., 2008). The communication efficiency is the main reason for this practice. Abbreviations with multiple interpretations, look-alike abbreviations, the idiosyncratic use of abbreviations and acronyms may lead to ambiguity, serious errors and death (Karch, 2004; Kuhn, 2007). Abbreviations and acronyms were considered by patients as intimidating medical jargon, and often confused health professionals from different settings (Molina Healthcare, 2004). GPs complained about the use of speciality-specific abbreviation and acronyms in discharge summaries (Kripalani et al., 2007). Medical records containing non-standards abbreviations were difficult to comprehend even for health professionals within the same speciality (Myers and Jennifer, 2011). Abbreviations in medical information are most vulnerable for contributing to serious errors. The proposed interventions include identifying and limiting the use of confusing abbreviations that may lead to fatal misinterpretations, and developing alert systems to detect unapproved abbreviations (Cohen, 1999; Helen, 2008; Myers and Jennifer, 2011).

This study confirms the significant use of shortened forms in discharge summaries. Even with a limited sample from single NHS Hospital Trust, the variation of abbreviations, acronyms, and other shortened forms was significant. Other kind of shortened forms found in this study include special symbols, numeric expressions, and also metonyms. These shortened forms were found in various parts of discharge summaries, not only the medication parts. The use of special symbols is likely to disappear with the introduction of electronic data entry systems as they are more difficult to input. Apparently, the idiosyncratic use of

shortened forms in discharge summaries causes a comprehension problem for GPs who would normally receive discharge summaries from different hospitals and specialties. The use of shortened forms is likely to be a more significant concern in the future as healthcare service is now moving to patient-centred approach. There is an expectation that the patient should be given a copy of discharge summary and able to comprehended the content (European Commission, 2006; Weinberg et al., 2007; Kazmi, 2008). In conclusion, while the use of shortened forms has its place in medical practice, their use should be minimal and standardised, especially if the records are shared by different health professionals and the patient, such as discharge summaries.

6.3   The implications for improving discharge summary systems

The previous discussion explicated the new insights gained from this study, and demonstrated how they expand current knowledge related to the different aspects of discharge summaries. In the following sections, the implication of this understanding for improving discharge summary systems are presented. These implications cover a number of areas of discharge summary record keeping.

6.3.1 Restructuring the authorship of discharge summaries

A discharge summary should be designed for its audience and reflect the multiple aspects of a patient's needs for continuity of care. This can be achieved by restructuring the authorship of discharge summaries. Currently, the content of discharge summaries is dominated by medical authorship, and the transfer of information related to non-medical aspects of the patient's ongoing care is often undertaken separately or even undocumented. This study suggests that the authorship of discharge summaries should be established as the collective responsibility of the multidisciplinary team members. This can be problematic in a paper record environment, but with the advent of electronic record systems, this approach becomes more feasible; different members of the care team can access

and input the data concurrently. The data entry can start once the patient is admitted to hospital, and be inputted progressively throughout the patient's episode of care, and completed and attested on the patient discharge. This approach is also likely to increase the awareness of health professionals about the multidisciplinary aspects of the patient's continuity of care.

6.3.2 Establishing a transitional care pathway.

In order to improve the patient's continuity of care, it is important to prevent errors and omissions in prescriptions, information about follow up tests, and further hospital appointments. This requires a reliable method of communication and coordination, and a close collaboration between secondary and primary care providers in the patient's follow up after hospital discharge. Achieving improvements in this area will require changes in the health policy regulating the interface between primary and secondary care services (Stille et al., 2005)

This study recommends the establishment of a transitional care pathway as a formal clinical procedure, if the patient still needs monitoring by hospital specialists. The transitional care pathway acts as a bridge between secondary and primary care, and the responsibility for the patient's ongoing care is shared by health professionals from both care settings with a multidisciplinary approach. The communication and coordination must be facilitated by IT systems that allow multiple-way correspondence between a range of health professionals. This is similar to the MDT approach in hospital care, but it extends to GPs and other community health professionals, and the coordination is undertaken through IT systems rather than a face to face meeting. Current social networking technology can be adopted for this purpose. Once all the outstanding issues of the patient's care that require the monitoring from the hospital practitioners have been addressed, the transitional care can be terminated. The primary care can fully resume the responsibility for the patient's care, with the coordination of the patient's GP. The transitional care approach can facilitate better, safer and

smoother transfer of responsibility for the patient's care from secondary to primary care providers. This is one possible concrete solution to the problem of communication and coordination deficits between secondary and primary care providers in current practice (Weinberg et al., 2007),

Along with this recommendation, the functionality of a discharge summary should be focused on the summary of the inpatient care episode. The information related to pending tests, follow up plans and coordination, should be part of the transitional care record keeping, and to be accessible to all relevant health professionals involved in the patient's continuity of care. In current practice, the inclusion of this information in discharge summaries appears to contribute to the problem of delayed discharge summaries. Moreover, any further letters from hospital doctors often became *"uncharted"* medical records. Thus, establishing a separate clinical record keeping for the transitional care pathway means all clinical information during the transitional care is to be documented. This includes the pending test results, the subsequent diagnosis, follow up decision, plan and interventions. Hospital doctors also can check whether their requests to the patient's GP have been undertaken. However, there are some issues to be considered with this approach, including the additional workload of hospital practitioners, investment in IT systems, confidentiality issue, and managing changes of hospital working practice and record keeping.

6.3.3 Increasing the competency of junior doctors

The junior doctor authorship in the completion of discharge summaries is a controversial issue considering their lack of specialist experience and knowledge. This study suggests that improving the competency of junior doctors is necessary if they are to be involved in the completion of effective discharge summaries. This can be achieved through formal education and training about discharge summary record keeping in combination with audit, feedback, and supervision in completing discharge summaries. Some studies confirmed positive outcomes,

when using these interventions in a controlled environment (Myers et al., 2006; Dinescu et al., 2011). This study proposes how these interventions can be implemented in practice. The formal training and education can be introduced in medical curricula and/or in training sessions in hospital. Audit and feedback can be implemented as part of junior doctor training assessment. Supervision can be implemented by introducing a policy that requires any discharge summary completed by a junior doctor to be attested or countersigned by a senior doctor. However, as a solution this may merely add additional complexity to the system and introduces a further delay yet would introduce a greater and clearer accountability. All complexity requires careful management.

6.3.4 Establishing the accountability of NHS Hospital Trusts

The deficits of hospital practice identified in this study demonstrates the lack of accountability of a NHS Hospital Trust to achieve high data quality and timely discharge summaries. Establishing the accountability of NHS Hospital Trusts in this area will require interventions in the commissioning (incentive) structure, and significant changes in NHS policies.

The plan to shift the healthcare services commissioning power to GPs, and the QIPP initiatives offer promising prospects for establishing a greater accountability of NHS Hospital Trusts in this area of practice (Department of Health, 2010). In line with these initiatives, this study suggests that Department of Health (DH) should require all providers (NHS, private and/or social enterprise) involved in discharge summaries preparation to develop a system of monitoring and surveillance to improve their levels of performance in achieving high data quality and timely discharge summaries to ensure the effective transfer of care. This could be undertaken as part of quality monitoring within the QIPP initiative, and NHS Hospital Trusts would be required to report outcome measures of their levels of performance. However, this may require the DH to define performance criteria and to implement clinical audit with feedback in order to be effective. Some

criteria suggested in this study includes: the completion of discharge summaries should not be delegated to hospital doctor who are not involved in the patient's care, and NHS Hospital Trusts have to implement training schemes if junior doctors are to be involved in the completion of discharge summaries.

6.3.5 Regulating the use of shortened forms in discharge summaries

The use of shortened forms in discharge summaries tends to be idiosyncratic. In order to prevent ambiguous interpretation, this study suggests the formalisation and standardisation of the shortened forms that are to be used in discharge summaries. This may be difficult to achieve in a paper record system. The introduction of electronic discharge summary systems provide the opportunity to achieve this objective due to their ability to control user behaviours at the point of data entry. An alert system can developed to detect the use of non-standard shortened forms. A simple reference terminology for shortened forms can be developed. As a minimum, the standard should consists of essential elements, including the shortened form, its full description, and a unique identifier. Every time a shortened form is used, its identifier is to be recorded in the electronic record. This will allow the full description can be resolved with the reference terminology if needed.

6.3.6 Improving the features of discharge summary data entry

Moving to an electronic discharge summary system is the way forward to produce better discharge summary systems. This study suggests important features that support the creation of better discharge summaries. These include:
- Supporting different cognitive tasks (prescribing drugs, coordinating follow up, reconciling patient medication record, writing a clinical narrative) associated with the content of discharge summary. For example, the data entry system should allow the hospital doctor to book outpatient

appointments, blood tests, or even the GP appointment, as part of coordinating the patient's follow up care.

- Providing access to the patient's medical records, clinical research evidence and medical knowledge resources.
- Integration with clinical ordering systems to allow hospital doctors to request tests, or to book appointments for patients as part of completing a discharge summary.
- Alert systems that detect the presence of non-standard shortened forms, invalid dates, abnormal medication dosages, typing and grammatical mistakes and empty mandatory fields.
- Providing the functionality to import and transform the content of the patient's medical record into a discharge summary.
- Allowing customisation of data entry based on speciality, type of patient admission and patient problems.
- Presenting *"blank"* field with less ambiguous *"null"* value flavours such as *"not known"*, *"not applicable"*, *"none"*.
- Supporting multiple authorships (nurse, hospital doctors, allied professionals).
- Commencing automatically when the patient is admitted to hospital.
- Supporting progressive data input.
- Reminder of incomplete data input when the planned discharge date is approaching, or if the patient has been discharged.
- Supporting mobility, for example handheld data input.

6.3.7 Structuring clinical coding data

In current practice, clinical coding in secondary care is solely for secondary purposes using classification systems such as ICD10 and OPCS4. NPfIT discharge report specification supports clinical coding for primary purposes. The coding data are represented as coded entries in HL7 CDA and use SNOMED CT

as the reference clinical terminology. Based on the understanding of how the various information contained in a discharge summary is supposed to be used, this study recommends that the clinical coding data to be sub-divided into different categories to reflect the different kinds of uses. The first category is the generic coded entries, which include clinical findings (diagnosis, allergy, complication, problems, conditions, assessments), clinical interventions (procedure, investigation, medication), and adverse events. The generic coded entries can be used as data source for decision support systems and the cross-mapping to existing classification systems. Generic coded entries embedded in the patient's EHR will continue to be relevant for the patient's care, as past medical history. The other categories should reflect the specific use of the coding data, which is assumed to be temporary. For example, medication reconciliation coded entries would be used to assist automatic reconciliation of patient medication record on the GP system. Order coded entries would be used to facilitate clinical order in a discharge summary such as requests to GPs or an outpatient appointment. This type of coded entry can be used to facilitate coordination between health professionals involved in the patient's continuity of care. Only clinical applications that support the required functionalities will be allowed to process the non-generic coded entries. Consequently, this study recommends that HL7 CDA adopts the features of coded entry specialisation, which is based on the specific purpose of the coded entries.

6.4 Summary

This chapter has presented the key insights gained from this study and the implications for improving discharge summary systems, and how these insights expand the current knowledge related to discharge summaries. Overall, this study claims the following contributions to new knowledge:

- This study has identified a number of hospital practices and other factors that contribute to the problems of poor data quality and delayed discharge summaries. These include the attitude of senior doctor, lack of regulations in the area of delegation and junior doctor training, deficits in communication and coordination between secondary and primary care providers.

- This study has demonstrated the medical orientation of current discharge summary construction and argued the need for a multidisciplinary discharge summary with multiple authorships and accountability.

- This study has demonstrated that TTOs were considered inconsequential by both hospital doctors and GPs due to the poor quality issue, and it is important to establish a greater accountability of NHS Hospital Trusts to achieve high data quality and timely discharge summaries.

- This study has proposed a formal transitional care pathway supported by innovative IT systems as the solution for safer, smoother transfer of responsibility for the patient's care from secondary to primary care providers.

- This study has elaborated how health professionals interacts through a discharge summary in real life practice, and developed hypothetical semantic structure in order to explain these interactions.

- This study reaffirms the significant use of idiosyncratic shortened forms in discharge summaries, including abbreviations, acronyms, metonyms, numeric expressions, special characters and signs, and their potential contribution to error.

- This study has identified a number of features of electronic data entry systems that could facilitate the creation of better discharge summaries and would support the interactions between health professionals.

- This study has recommended that clinical coding data should be structured according to their intended uses by clinical applications, including to interactions between different health professionals.

- Methodologically, this study has demonstrated how theoretical concepts, such as pragmatic, semantic, syntactic, speech act and mental frame, can be used together as conceptual framework to investigate various aspects related to the construction of discharge summaries in a holistic approach. This approach can be replicated in researching other clinical documentation.

CHAPTER 7 CONCLUSION

7.1 Introduction

Discharge summaries play a vital role for ensuring patient safety during the transfer of responsibility for the patient's care between secondary and primary care providers. They are often the only means of communication and coordination between hospital doctors and GPs with regard to the patient's continuity of care. Unfortunately, the paper discharge summaries, which are still widely used, are problematic in terms of having poor data quality and slow transmission to GPs. Moving to electronic discharge summary systems is seen as the only way forward to rectify the current problems associated with discharge summaries. Recently, the NHS policy and the NPfIT programme were established to accelerate the adoption of electronic discharge summary systems by NHS Hospital Trusts in England.

However, the data entry systems are not the only factors that contribute to the problems of poor data quality and delayed discharge summaries, and moving to electronic discharge summary systems alone may not solve all current problems related to discharge summaries. In order to provide comprehensive solutions to improve discharge summary systems, a more holistic understanding of various aspects related to discharge summaries is required. It is within this context, that the research aim and objectives were set.

Firstly, I will revisit the research aim stated in Chapter One:

"To gain a better understanding of various aspects related to the construction of discharge summaries, and the implications for improving discharge summary systems".

In order to achieve this aim, a number of research objectives were developed:

1. To investigate current hospital practice associated with the completion of a discharge summary.

2. To identify hospital practice and other factors that contribute to the problems of poor data quality and delayed discharge summaries.

3. To explore the pragmatic, semantic, and syntactic aspects of a discharge summary.

The findings related to research objectives has been presented in Chapter Four and Five. The discussion for the research aim of this study has been given in Chapter Six. The remainder of this chapter presents the research summary, limitations of the study, recommendations for further research and the final remarks.

7.2   Research summary

The first and second research objectives are closely related. By understanding the process of patient discharge and the practice of completing discharge summaries within a real life context, this study aimed to explicate hospital practice and other factors that contribute to the problems of poor data quality and delayed discharge summaries. The qualitative account of this investigation has been presented in Chapter Four and are summarised in the following section.

A patient discharge is a multidisciplinary process, but discharge summaries are largely used by medical doctors to transfer information related to the medical aspects of the patient's care. The change to multidisciplinary discharge summaries with multiple authorships is recommended. Moreover, using two forms of written discharge summaries, the TTO and full discharge summary, appeared to be a common practice in many NHS Hospital Trusts. However, TTOs were seen as inconsequential as discharge summaries in current practice. They have become notorious for poor data quality; clinical information beyond the medication prescription was often limited, missing, indecipherable, irrelevant and inaccurate. Full discharge summaries were perceived as better in terms of data quality, however, they were unacceptably delayed; a delay of one month post discharge

was common.

This study found that the problems of poor data quality and delayed discharge summaries were caused by the interactions of hospital practice and other factors, including:

- The low priority, availability and accountability given by senior doctors for the completion of high data quality and timely discharge summaries.
- The absence of training, feedback and supervision provided for junior doctors if they are involved in the completion of discharge summaries.
- The absence of any robust book keeping process to ensure of patients requiring full discharge summaries.
- The absence of regulatory or performance monitoring approach for ensuring timely and proper delegation of completing discharge summaries.
- Deficits in the communication and coordination between hospital doctors and GPs.
- The lack of accountability and insufficient commitment by NHS Hospital Trusts to improve discharge summary systems.

The recommendations to improve discharge summary systems based on these insights including: establishing a transitional care pathway, training junior doctors if they are involved in the completion of discharge summaries, and establishing accountability of NHS Hospital Trusts through policy making, monitoring and audits.

The interrogation of the pragmatic, semantic, and syntactic aspects of discharge summaries aimed to gain a better understanding of how different information in discharge summaries are used, interpreted and represented in a real life context. The results of this investigation have been presented in Chapter Five, and the following sections will provide a summary of these results.

For the pragmatic aspect analysis, the study examined the contextual factors that influence the content and features of discharge summary records. These factors include the functional contexts, the authorship, the characteristics of the patient case and the data entry system used. Discharge summaries serve the following functions: compliance with the medico-legal aspect of patient care transfer, a notification and information update for the GP, a device for follow up coordination, a prescription order to supply patient's take home medication, the medical record for a patient's episode of care in hospital, and an input source for the GP to update patient records. The characteristics of patient case include the type of admission, the length of stay, and the patient's specific risks/problems. The authorship factors include the level of seniority and the speciality of the author. The electronic data entry systems have two distinctive advantages over paper and dictation data entry systems, including: the ability to control user behaviour in data entry, and allowing the separation of structure for data entry, representation and presentation.

The semantic aspects deal with the interpretation of information in discharge summaries. This study offered three semantic models for understanding information in discharge summaries. The speech act, mental frame semantics was adopted in the beginning of this study, while the external representation semantic model was added during the data analysis phase. The Speech Act semantics (Searle, 1969) is built on the premise that interpretation of some information in discharge summaries cannot be separated from the context of interaction and communication between health professionals. Information in discharge summaries can be seen as *"actions"* of these health professionals. Using this semantic model, this study identified a number of interactions embedded in discharge summaries. The medication prescription in the TTO is the order from hospital doctor to pharmacist to dispense the medication to the patient. Hospital doctors may make a request to the GP to undertake a specific follow up intervention; or they may give advice and/or information to the GP through the discharge summary letter.

The Mental Frame semantics (Minsky, 1981) was adopted in this study based on the premise that interpretation of discharge summary is mediated through human agency, the health professionals involved in the completion of discharge summaries. A mental frame is the essential cognitive structure that links information to actions. Information in discharge summaries is a representation of the mental frame that these health professionals used in order to coordinate and complete the task associated with a patient discharge, including: prescribing and dispensing medication, reconciling the patient's ongoing medication, coordinating follow up, and writing a clinical narrative. This study offers hypothetical mental frame, or semantic structure, associated with these tasks in order to explain the reason for the inclusion of the various information in discharge summaries. The external representation semantics was used to explain that some elements in discharge summaries refer to the entities registered in an external system. This particularly applies to the demographic data.

The syntactic aspect is related to the composition, structure and presentation of information in discharge summaries. The syntactic aspects of the discharge summary were presented under three themes: language code, grammar and presentation style. The language code is concerned with the symbolic features used to represent information. Paper discharge summary records featured the use of a range of shortened forms and synonyms, which causes potential problems for standardisation and interoperability. The grammar is concerned with the structure and constraints used to represent elements of, or the whole discharge summary record. Document and section level structure of discharge summaries seemed to vary significantly between individual doctors and organisations. The structure can be based on categorisation or attribution of clinical information. A clinical narrative displays unique grammatical characteristics. The information structure, or ordering, in a clinical narrative seems to employ a mixed combination between clinical reasoning and temporal frame.

The interrogation of the pragmatic, semantic and syntactic aspects of a discharge summary produced three recommendations, including: regulating the use of shortened forms in discharge summaries, improving the features of the discharge summary data entry, and structuring clinical coding data.

7.3 Limitation of the study

As with other research studies, this inquiry has limitations. The interview data was from one NHS Hospital Trust and the sample was small. While this approach was sufficient for the objectives of this study, it is futile, based on this small sample, to claim that the findings are generalisable to other NHS Hospital Trusts. However, there is some indication that the findings in this study are not unique to the case study NHS Hospital Trust. Analysis of the TTO and patient discharge policies from other hospitals during this study confirms that conditions of working practice in many NHS Hospital Trusts are similar to those of the case study NHS Hospital Trust.

As with any qualitative work, the interpretation in this study is not value neutral (Denzin, 1989). Researcher bias, subjectivity, blind spots and cognitive limitations may have influenced the formulation of the research, data collection, data analysis and interpretation. Additionally, informants also contribute to potential bias (Northrip et al., 2008). In this study, this bias was counteracted by data from other informants. Even with the rigour undertaken in this study to refine and provide a truthful account of the findings, it cannot claim neutrality. It is for the audience to judge the authenticity of the account presented in this thesis. Indeed, any criticism is useful for illuminating the researcher's bias and values (Brown, 1996).

7.4 Recommendations for further research

The new insights gained from the investigations of this study also open up the areas that warrants further investigations, including:

- Investigating and developing record structure for multidisciplinary discharge summaries.
- Investigating the different features between the clinical narrative written by junior doctor and those written by senior doctors.
- Investigating features of electronic discharge summary system implemented by different NHS Hospital Trusts.
- Feasibility study of the transitional care approach as a solution for the problem of deficits in the communication and coordination between secondary and primary care providers.
- Exploring and developing an IT based communication and coordination model for the transitional care approach.
- Investigating the distribution of completion time of different cognitive tasks associated with the content of discharge summaries.

7.5 Final remarks

Finally, this thesis has shown that understanding clinical records, such as discharge summaries, and the issues associated with them can be more effectively achieved by investigating the context in which they are used in real world practice. In this study, this approach has been beneficial for drawing out the hospital practice and other factors that contribute to system failure associated with discharge summaries in current practice. The use of the pragmatic, semantic, syntactic conceptual framework and some relevant theories also useful to explicate aspects of discharge summaries that has not been explored in literature. Similar approach can be used to investigate other kind of clinical records, or any information sharing context.

Lastly, this thesis demonstrated that simply moving from paper based to electronic clinical records does not resolve all issues associated with discharge summaries. Improving discharge summary systems requires a comprehensive overhaul and range of interventions including innovative use of technologies, standardisation of

various aspect of discharge summaries (not just the structure of content), changes in the NHS policy and transformation in the areas of hospital working practice and its working relationship with primary care providers. Further development and transformation in these areas must be fostered. This is left to future research and endeavours.

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APPENDICES

APPENDIX 1

THE RCP APPROVED HEADINGS AND DEFINITIONS FOR DISCHARGE SUMMARY RECORD

Headings/sub headings	Definition/illustrative description of the type of clinical information to be recorded under each heading
GP details	
- GP name	The name of the patient's usual GP
- GP practice address	The name and address of the patient's registered GP practice.
- GP practice code	Code which defines the practice of the patient's registered GP.
Patient details	
- Patient surname, forename	
- Name known as	
- Date of birth	
- Gender	
- NHS Number	
- Patient address	Patient's usual address.
- Patient telephone number(s)	
Admission details	
- Method of admission	How the patient was admitted to hospital, e.g. emergency, elective, transfer, maternity.
- Source of admission	Where the patient was immediately prior to admission, e.g. usual place of residence, temporary place of residence, penal establisment.
- Hospital site	Physical to which the patient was admitted.
- Responsible trust	The NHS hospital trust to which the patient was admitted (this may not be the same as the name of the hospital).
- Date of admission	
- Time of admission	Electronic environment only.
Discharge details	
- Date of discharge	
- Time of discharge	Electronic environment only.
Discharge method	e.g. Patient discharged on clinical advise or with clinical consent; patient discharged him/herself or was discharged by a relative or advocate. Patient died (national code).
- Discharge destination	
• Type of destination	Can include private dwelling, penal establishment, care home etc (national code).
• Destination address	Not required if patient's own home.
• Living alone	Yes or No.
- Discharging consultant	The consultant responsible for the patient at time of discharge.

- Discharging speciality/department	The speciality/department responsible for the patient at the time of discharge.
Clinical information	
- Diagnosis at discharge	Primary diagnosis, secondary diagnoses and relevant previous diagnoses, including complications and co morbidities (e.g. for coding purposes).
- Operations and procedures	New and relevant previous operations and procedures, including complications and adverse events.
- Reason for admission and Presenting complaints	The health problems and issues experienced by the patient resulting in their referral by a healthcare professional for hospital admission, e.g. chest pain, blackout, fall, a specific procedure, investigation or treatment.
- Mental capacity	The mental capacity of the patient to make decisions about treatment etc. Example, where an Independent Mental Capacity Advocate (IMCA) is required for decisions relating to discharge destination, medical treatment, ability to consent etc. Any information given to a significant other in relation to this matter.
- Advance decisions to refuse treatment and Resuscitation status	Written documents, completed and signed when a person is legally competent, that explain a person's medical wishes in advance, allowing someone else to make treatment decisions on his or her behalf later in the disease process. Includes Do Not Resuscitate orders.
- Allergies	Allergies, drug allergies and adverse reactions.
- Risks and warnings	Significant risk of an unfavourable event occurring, patient is Hepatitis C +ve, MRSA +ve, HIV +ve etc. Any clinical alerts, risk of self neglect/aggression/exploitation by others.
- Clinical narrative	Very brief narrative description of the in patient episode. Should include complications and nutritional status.
- Relevant investigations and results	The relevant investigations performed and their respective results, where present, e.g. endoscopy, CT Scan etc. It is important to highlight investigations and test results which relate to a GP action.

- Relevant treatments and changes made to treatments	The relevant treatments which the patient received during the inpatient stay. Can include medications given whilst an inpatient.
Measures of physical ability and cognitive function	e.g. Activity of Daily Living and cognitive function scale scores if not independent, weight/nutritional status at discharge.
- Medication changes	If admission medication stopped need to state reason. If medication started and stopped because of adverse reaction need to state reason.
- Discharge medications	Can include: • medication dispensed on discharge • medication prescribed and not dispensed (e.g. patient's own) • medications to be commenced after discharge • NOMAD/pill dispenser being used.
- Medication recommendations	A medication recommendation about a drug or device allows a suggestion to be made for starting, discontinuing, changing or avoiding items in a patient's medication record. The medication recommendation may be made to another clinician or directly to the patient. Examples include: • continue medication x and y • change dose of z after 3 weeks • consider change from medication a to med b if not effective • stop medication c and d
Advice, recommendations and future plan	
- Hospital	Actions required/that will be carried out by the hospital department. To include: • action (e.g. outpatient, pending investigations and results, outstanding issues) • person responsible • appropriate date and time
- GP	Actions required by the GP. To include: • action (e.g. specific actions, pending investigations and results, outstanding issues, HRT and cervical screening) • person responsible • appropriate date and time

	• suggested strategies for potential problems, e.g. telephone contact for advice
- Community and specialist services	Actions requested/planned/agreed with community services (community matron, palliative care, specialist nurse practitioner, rehab team, social services). To include: • action • person responsible • appropriate date and time.
Information given to patient and/or authorised representative	This can include: • relatives and carers • specific verbal advice and details of any discussions • written information including leaflets, letters, any other documentation. Differentiation required between information given to patients, carers, and any other authorised representatives.
Patient's concerns, expectations and wishes	The patient's expressed wishes, expectations and concerns
Results Awaited	Y/N (If Yes please specify), e.g. pathology, investigations, imaging.
Person completing summary	
- Doctor's name	
- Grade	
- Speciality	
- Doctor's signature	Only needed on paper discharge record.
- Date of completion of discharge record	
Distribution list	

APPENDIX 2

THE RCP DISCHARGE SUMMARY PROFORMA TEMPLATE

Discharge Summary USE BLACK INK ONLY

Patient Details	Admission and GP Details
Surname Forename M / F/ …………… Date of Birth NHS/ Hosp No. Address Tel No.	Discharging Consultant Discharging Speciality/ Department Method of Admission Date of Discharge Date of Discharge G.P. Details
Diagnosis at Discharge	**Operations and Procedures**

Reason for Admission and Presenting Complaint(s)

Clinical Narrative

Relevant Investigations and Results

Discharge Destination

Relevant legal Information (e.g. was an independent Mental Capacity Act Advocate required)

Information given to patient and/or authorised representative (including e.g. see GP in 2 weeks)

Physical Ability & Cognitive Function :   On Admission   At Discharge
Physical
Cognitive
Other

Advice, recommendations and future plans (including results awaited and outstanding investigations)
G.P. Actions (Date)

Strategies for potential problems

Discharge Summary USE BLACK INK ONLY

Name	D.O.B	NHS/ Hosp No.

Actions and Outstanding Investigations				
	Action		Person Responsible	Date
Hospital (e.g. OP Appt) /Investigations				
Community & Specialist Services (e.g. nursing, therapy)				

Medications Stopped/ Changed Yes/ No If yes please give details:		**Allergies/ Risks & Warnings**

Discharge Medications	**Dose**	**Frequency**	**Route**	**Duration**	**Quantity Supplied (Pharmacy used)**

Compliance aid? Dossette/ Nomad/ Other   Supplying Pharmacy
Pharmacy dispensed by   Checked by   Date

Details of Discharging Doctor

Print Name_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _   Doctors Signature _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Date _ _ _ _ _ _ _ _ _ _ _ _ _ Grade FY/ ST< 3/ ST> 3/ SpR/ Con Bleep No. _ _ _ _ _ _ _ _ _ _ _ _ _

APPENDIX 3

LETTERS OF INVITATION TO PARTICIPANTS

Invitation Letter to research participants

My name is Kusnadi, I am a postgraduate research student of the University of Huddersfield. I am approaching you to invite you to participate in the study that I am conducting as part of my studies towards the degree of Doctor of Philosophy (PhD). This study is part of a collaboration between the School of Human and Health Science, the University of Huddersfield and the National Health Service Connecting for Health (NHS CFH).

You are probably aware that NHS CFH are building the information technology infrastructure for the NHS electronic health record. Discharge summary reports are used to communicate patient information when transferred from one care setting to another. This project seeks to capture the intended meanings (semantics) and intentions (pragmatics) contained in discharge summary reports in order to inform the refinement of the information technology requirements for the electronic health record. You are invited to participate as you regularly complete discharge summary reports as part of your clinical role and therefore are an expert.

Enclosed with this letter of invitation is an information sheet explaining in more detail the study and provides information about what you would be expected of you to contribute if you decide to participate. If after reading the information you are interested in taking part please complete the enclosed consent forms and return to me in the enclosed pre payment envelope. I will then get in touch with you directly to make the necessary arrangements.

If however you would like to discuss the project with me, or my supervisor, in more detail before reaching a decision about participating please feel free to contact me on Tel: 01484 471 623, Mobile : 07503 285 909 or email: k.kusnadi@hud.ac.uk. My supervisor Professor Annie Topping can be contacted by Telephone 01484 473974, her secretary 01484 473646 or email: a.e.topping@hud.ac.uk

Thank you for reading this letter and I do hope you feel able to participate.

Yours sincerely

Kusnadi

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HUDDERSFIELD,
HD1 3DH

APPENDIX 4

RESEARCH PARTICIPANT INFORMATION SHEET

	Research Participant Information Sheet
University of HUDDERSFIELD — Inspiring tomorrow's professionals	Translating Clinical Records into Electronic Health Records: Semantic and Pragmatic Perspectives

INVITATION TO TAKE PART IN RESEARCH

You are invited to take part in a postgraduate (PhD) research study undertaken at the School of Human and Health Sciences, University of Huddersfield. The research project has been reviewed and approved by the School Research Ethics Panel (SREP) on behalf of the University and by a local NHS Research Ethics Committee (REC).

This leaflet seeks to provide you with information about the study so that you can make informed decision whether you wish to take part in the research.

- **Part 1. About the Study**
  The first part tells you why the study is being done and what it would involve for you to take part.
- **Part 2. Conduct of the Study**
  The second part gives you more detail about the conduct of the study.

Please read the information carefully and talk to others, your colleagues or directly with me (contact details at the end of this information sheet), about it if you wish. Feel free to ask me, or my supervisor, if there is anything unclear or if you require more information. Take time to decide if you would like to take part.

PART 1. ABOUT THE STUDY

What is the research about?

The UK Government has invested considerable funding into the development of an IT system for supporting the use of electronic health records in the NHS. The umbrella organisation delivering this project is NHS Connecting for Health. This study focuses on one element of the proposed electronic health record system namely discharge summaries, or reports.

These reports are used to summarise information about care received in secondary care for general practitioners or other health professionals in primary care to ensure ongoing patient needs are met. The main purpose of this study is to investigate the processes involved in translating clinical information into text based discharge reports and then investigate the semantics and pragmatics associated with electronic based translation of the reports. The study therefore is interested in meaning (semantics), context and intention (pragmatics) of the communication process. The findings from this study will assist the development of the electronic health record and help identify any limitations in existing electronic standards in order to enhance the capture of intended semantic and pragmatics of clinical communication.

This project has been funded through collaboration between the University of Huddersfield and the NHS Connecting for Health (NHS CFH).

Why have I been invited?

You have been invited to take part because you have experience of writing discharge reports

in a secondary care setting and it is your expertise in summarising clinical information in real world settings that we wish to capture.

Do I have to take part?

Your participation in the study is voluntary. It is totally up to you to decide if you want to take part. Once you have read this information sheet and if you are interested in participating, please sign the two consent forms (with researcher's signature on it) and return one of them in the stamped addressed envelope provided. You can keep the other copy. Before you sign and return the consent form, if you have any questions or require more detail information, feel free to contact me (see the details provided at the end of this leaflet). The consent form is required as a record of your agreement to take part. You are however free to withdraw at any time without giving a reason.

What will happen to me if I take part?

On receipt of your signed consent form you will receive hand delivered a package containing:

- A fully anonymised case record
- A discharge summary report template
- An instruction sheet giving detailed information

The instruction sheet will invite you to write a discharge summary report for a specified episode of care just as you would normally write for a patient on discharge. As part of the electronic health record project, NHS Connecting for Health in collaboration with the Royal College of Physicians have designed a discharge report template. You will be asked to use this template to summarise the information you would normally include in a discharge report.

Once you have had time to complete the report, two weeks, I will contact you to arrange a time and place to interview you to discuss how you decided what to include in the discharge summary report and the meanings, intentions you wished to communicate to the receiving practitioner. Also I would like to capture any views you might have about using the template for completing the discharge summary report. This interview will be conducted by an experienced researcher and I will be in attendance.

The interview will take about one hour. With your consent, the interview will be audio recorded and then all the discussion will be transcribed. Any personal information that might allow you to be identified will be removed before analysis and your identity will be fully anonymised in the transcripts. All information will be kept completely confidential. Only the researcher and academic supervisors may have access to the recording and the transcript. The audio records and your personal data will be destroyed after the study finish in compliance with NHS governance requirements. Some of your words may be quoted or used in the publications or study report, but your identity will be anonymised.

What will I have to do?

You will be asked to read the information sheet, and when you are sure that you want to take part, you will be asked to sign two consent forms and return one of them to the research office in the pre paid envelope provided or directly to the researcher. If you give your consent, a package comprising a fully anonymised case record, discharge summary report template and an instruction sheet will be hand delivered to you. You will be asked to create a discharge summary report based on the patient case record and ideally complete the discharge report within two weeks of receiving the package. After two weeks you will be contacted to arrange an interview at a time place convenient for you.

What are the possible risks in taking part?

There should be no risks to you if you chose to take part in this study. The purpose of the study is to capture through your expertise intended meanings and therefore no judgement will be made about your ability to write discharge summary reports or indeed your personal views. Your participation is a great value to help to gain a better understanding of the nature of communication in healthcare and how information systems and standards may more effectively support practice.

What are the possible benefits in taking part?

This study may not have direct benefits to you. However, your participation will help provide a better understanding of clinical information communication. The study may produce recommendations about how health information technology and standards should be developed to support and improve clinical communication.

What if there is a problem?

The second part of this leaflet describes the conduct of the study. Any complaints about the way you have been treated during the study will be addressed accordingly based on the conduct described.

What should I do if I am now interested in taking part?

Please read all the information in Part 2 before deciding to take part and then signing the consent form (two copies) and sending one of them in the provided pre paid envelope.

Contact Details

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PART 2. CONDUCT OF THE STUDY

What if there is a problem in taking part?

If you have a concern about any aspect of the study you should ask to speak to the researcher, Kusnadi, who will do their best to answer your question. His telephone numbers are: 01484 471623 and 07503285909. If you remain unhappy and wish to complain formally, you can do that by contacting the Director of Centre for Health & Social Care Research, Professor Annie Topping, by her telephone number **01484 473 974** or by her email address: a.e.topping@hud.ac.uk.

Will my taking part in the study be kept confidential?

Yes, because we will follow the best ethical and legal practice and all information about you will be handled in confidence. All information that is collected about you for the research will be kept strictly confidential. Data from your interview will be collected by an experienced researcher and myself. The interviews will be transcribed and identifiable by a code number, not names, on the recording and transcript so you cannot be identified. The recording will be downloaded to a password protected file. All paper copies of interviews and discharge summary reports will all be kept in a locked cabinet in the University of Huddersfield. The data collected from all the interviews and discharge summary reports will be analysed and used to prepare the study report. Only the researcher and his supervisors at the University of Huddersfield will have access to the recorded or written data. We have a duty of confidentiality to you as a research participant and we will do our best to meet this duty. All your personal data will be destroyed at the end of the study.

What will happen to the study results?

The overall result of the study will be written as thesis. In addition to that, the results may be reported in academic journals and conferences. The researcher may also present the results to the Calderdale and Huddersfield Foundation NHS Trust and NHS Connecting for Health. You will not be identified in any of the presentations and publications. You anonymity is our priority. A summary of the results will be sent to you via email or post when the study finish if you would like a copy.

Who is funding the study?

The study is funded by the University of Huddersfield through a collaborative project with NHS Connecting for Health.

Who has reviewed the study?
The study has been reviewed and approved by the School Research Ethics Panel of the University of Huddersfield as well as a NHS Research Ethics Committee to protect your confidently, safety, rights and wellbeing.

Further Information
If you require any further information about this study or you have any other concerns, feel free to contact the researcher, Kusnadi, or my supervisor Professor Annie Topping.

Thank you very much for reading this information

APPENDIX 5
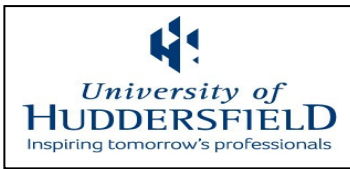
RESEARCH PARTICIPANT CONSENT FORM

Translating Clinical Records into Electronic Health Records:

Semantic and Pragmatic Perspectives

University of HUDDERSFIELD
Inspiring tomorrow's professionals

Hereby, I give my consent to take part in this study and confirm that (please tick!),

	Yes	No
I have read the information sheet and have been fully informed of the nature and aims of this research and consent to taking part in it.	☐	☐
I understand that I have the right to withdraw from the interview at any time without giving any reason, and a right to withdraw my data if I so wish.	☐	☐
I give my permission for my interview to be audio recorded.	☐	☐
I give permission to be quoted, but my identity will be anonymised.	☐	☐
I understand that the recording will be kept in secure conditions at the University of Huddersfield and my interview data will be treated confidentially	☐	☐
During the course of the study, I agree to maintain confidentiality of any sensitive (if any) information from the materials used.	☐	☐
I understand that no person other than the interviewers and his supervisors will have access to the recording and the transcripts.	☐	☐
I understand that my identity will be protected and fully anoymised within the research report and that no information that could lead to my identity being identified will be included in any report or publication resulting from this research.	☐	☐
I understand that relevant sections of my medical notes and data collected during the study may be looked at by regulatory authorities or from individuals in the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records	☐	☐

Additional Comments: _____

_____

_____

Participant

Name   :

Signature:

Date   :

Researcher

Name :

Signature :

Date   :

Two copies of this consent form should be completed: One copy to be retained by the participant and one copy to be retained by the researcher. Please contact the researcher if you need more information or explanation about this consent form.

APPENDIX 6

INTERVIEW GUIDE/SCHEDULE

University of HUDDERSFIELD
Inspiring tomorrow's professionals

Translating Clinical Records into Electronic Health Records: Semantic and Pragmatic Perspectives

Part A. Capturing process of writing discharge documents in current practice

☐ **On discharge, who need to be contacted or write a letter to?**

For each

☐ **Why/purpose? Term used for the doc/process ?**

☐ **Who** dictate/write/signed? for **whom**? **when** write and deliver?

☐ **What** Information to include? which one is most important?

☐ **Additional purposes** (Coding, reimburse, quality audit, pharmacy?

☐ **Which one is your role?**

How you write? → ☐ How you usually write discharge?
- ☐ Any particular/regular strategy or pattern?
  - ☐ Any proforma interaction? Are you directed by the prompt?
- ☐ how to start with? Information to put down first? Order
- ☐ Information source used?

Discharging communication issues?
- ☐ Is it necessary for each patient case to have discharge doc ? Any criteria if not ?
- ☐ Delivery of doc →
  - ☐ Way to deliver?
  - ☐ How long? Acceptable delay? Any guideline on this?
  - ☐ Possible risks to patient if delay? Example?
- ☐ Narrative **VS** Stuctured information
- ☐ Calling from GP! **normally happen**? **Expected**?
- ☐ The importance of each (what happens if all narrative or all structured?)
- ☐ Is it one more difficult than others? Why only consultants do the narrative?

Part B. Capturing the intended meaning, purpose and significance

☐ **Please summarise of the patient's episode of care**

Overview of the patient case
- ☐ Who should responsible to continue care to patient? Do they get discharge docs? If not why?
- ☐ What is the risk if no discharge documents are ever sent
- ☐ Strategy you use to create discharge →
  - ☐ Information source used to construct the discharge?
  - ☐ Which are read first? Which read most? Which read in detail?
- ☐ What is the difference of writing discharge in this study compared to your normal routine to write discharge?

Probing semantic and → For each information/phrase
- ☐ Explain more detail
- ☐ Significances ? Purposes? Expect recipient to do?
- ☐ What impact if not there?

Part C. Capturing experience of using the RCP discharge proforma

☐ **Any comments or feedback (+/ /neutral) after using this RCP**

Experience of using RCP
- ☐ **Any concerns?**
  - ☐ Easy to understand? Which headings are unclear? Need to read heading def
  - ☐ Any Ambiguity ? Redundancy (that will be blank all the time)?
  - ☐ Fit for purpose? Is it okay with structure/layout and ordering?
- ☐ **Compare to your current proforma ? any significant**
- ☐ **Agree to use this proforma in your current practice? Any concern and**

General issues on template
- ☐ **normally write narrative? Under which heading?**
- ☐ **Opinion on having one standard proforma which combining narrative and structured**
  - ☐ Concerns? Barriers? Limitation?
  - ☐ Who should responsible to create it?
  - ☐ Potential Benefits?
- ☐ **Recommendations to improve template design?**
  - ☐ Number of pages
  - ☐ Structure/layout?

General issues on discharge
- ☐ **Concerns of current discharge communication including via telephone?**
- ☐ **Suggestion to improve current discharge/transfer communication**

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APPENDIX 7

NURSE CHECKLIST FOR PATIENT DISCHARGE USED IN THE CASE STUDY NHS TRUST

TRUSTWIDE DISCHARGE PLAN AND CHECKLIST

Addressograph label for demographic details

Ward

Consultant

Named Nurse

Estimated Date of discharge (EDD) .... *Actual Date of discharge (ADD)* ....
Nurse Led Discharge considered and actioned as appropriate
KEY :- 'X' = not applicable; If 'X' marked within the EDD column, please check when planning actual discharge that this still applies. **Initials & signature must be documented in the Signature Register**

	Arrangements/Actions required	Date informed of EDD/actions needed + initials	Date informed of ADD & actions in place + initials
1	Patient and carer informed - circle		
2	Care home informed		
3	Check type of care home– Residential/Nursing– circle		
4	Name of Care Home -		
5	Community Matron informed if more than 3 admissions in 12 months		
6	Physio; OT; SALT informed – circle all that apply		
7	Section 2 completed		
8	Section 5 completed		
9	Housing type – house/bungalow/flat/care home/house - circle		
10	Lives alone/with relative-relationship		
11	Access to home - no path/field/steps – how many steps......		
12	Access to door –key/digi lock number...............		
13	If own home – check heating/food - circle		
14	Social worker informed state name........................		
15	Social Service required – restart/new package		
16	Details -		
17	Transport arranged–own/car 1/car 2/stretcher/WYMAS assess - circle		
18	Suitable clothing for travel		
19	Valuable s returned		
20	Venflon removed – yes/no		
21	Clips/sutures removed		
22	District Nurse informed		
23	District Nurse Activity required – state here -		
24	Continence – catheter/incont pads/high rise seat supplied - circle		
25	Continence assessment done Yes or No please circle		
26	Check wound/pressure areas - waterlow score		
27	Enteral feeds/pump/education of carer - circle		
28	Bed/mattress/hoist/commode/Tissue Viability - circle		
29	Medication/oxygen/food supplement/nebulisers - circle		
30	Meds checked by ward nurses and discharge lounge - circle all		
31	Dossette box - who fills it – state & contacted yes/no - circle		
32	Medication reminder card needed/not needed - circle		
33	OPD/anticoag arranged /transport booked – circle		
34	Sick note given		
35	Discharge info/advice given (written where applicable)		
36	Discharge summary given to patient and sent to GP		
37	Transfer to discharge lounge – checklist re-checked		

Copy for Patient/Carer on discharge.
Use free text space overleaf if required
Discharging Nurse's signature, Block capitals and date...

APPENDIX 8

THE TTO PROFORMA OF THE CASE STUDY NHS TRUST

Medication and Discharge Summary

Dear Dr

White to GP   Blue to Patient's Notes   Pink to Patient   Green to Pharmacy

| 0400510 |

Hospital .... Ward	Patient's Name ....
Date admitted .... Date discharged	HHS Number .... DOB....................
Consultant	Home Address ....
Discharged to	....

Findings, Details of Investigations, Diagnosis and/or procedures and their dates | Weight (kg)

Presentation

Investigation(s)

Progress

Diagnosis

Complications

Follow up arrangements/Outpatient Appointments

Allergies and Adverse Drug Reactions - List the medicines or Substances & the nature of the reaction (write NKDA if none)

It is mandatory to complete this section

Medicine/Substance	Reaction

Discharge Medication
All current medication must be included

Number of Medication and Discharge Summaries 1 2 3

Self medicating: yes ☐   no ☐

DRUG AND FORM	DOSE	DIRECTIONS	Duration of treatment		Supply - min 14 days	
			Continue by GP(✓)	Course (days)	From Ward	From Pharmacy

Medication written by pharmacist:	Pharmacist check:	Dispensed by:	Date:	Accuracy check:
Initial: Date:	Initial: Date:			

PHARMACY ONLY: Reminder Card ☐   Counselling ☐   Large Print ☐   No CRC ☐   MDS ☐   Chemist   tel:

Information on medication changes during admission MUST BE COMPLETED with medication change details

DRUG	Started ✓	Stopped ✓	REASON FOR CHANGE (include details of dose changes)

If no changes made to medication-please tick this box ☐

DOCTOR'S SIGNATURE	Bleep No	DISCHARGE NURSE'S SIGNATURE	
PRINT IN CAPITALS	Date:	PRINT IN CAPITALS	Date:

You may use this letter to inform your Community Pharmacist/Community Nurse of any changes to your medication

APPENDIX 9

THE TTO PROFORMA OF HOSPITAL X

PATIENT DISCHARGE NOTE — Sheet __/__ of __/

Complete in black ball point directly on a hard surface. For controlled drugs the total quantity (words & figures) must be

SURNAME	**ADDRESS** (If using label, ensure attached to all sheets)
FORENAME	
D.O.B.	
HOSPITAL No.	NHS No.
G.P.	CONSULTANT / COST CENTRE
	ADMISSION DATE
	DISCHARGE DATE / WARD
	DISCHARGE / DIED / TRANSFERRED TO

FOLLOW UP ARRANGEMENTS / OUTPATIENT APPOINTMENTS

☐ None	☐ Clinic appt. date __/__/__	☐ District / Practice Nurse	☐ SAP
☑ In ___ weeks/months	☐ Clinic appt. date will be posted	☐ Social Services	☐ SALT
☐ Physiotherapy	☐ Occupational Therapy	☐ Anticoag. clinic appt. date __/__/__	☐ Other (state)

Nurse signature | Print name | Date

PRIMARY DIAGNOSIS (MAIN CONDITION TREATED)

PROCEDURES / OPERATIONS	DATE
	DATE
	DATE

ALL OTHER ACTIVE CONDITIONS / COMPLICATIONS

ADVICE TO GP

DRUG ALLERGY STATUS (or specify if none known)	WEIGHT (kg)

DRUGS STOPPED SINCE ADMISSION	DATE STOPPED	REASON

MEDICATION ON DISCHARGE (if more than 10 drugs, use another sheet)

MEDICINE AND FORM (Approved name in capitals)	DOSE and DIRECTIONS	Drugs changed since admission — Started / Changed	Drugs changed since admission — Reason for Change	Duration of treatment — Continue (✓)	Duration of treatment — Course (days)	Quantity supplied — From Ward / POD	Quantity supplied — From Pharmacy
PARACETAMOL 1g				✓			8x32
INDOMETHACIN				✓			
OPIIY 2				✓			8x28
KETOPAM 3				✓			
SENNA TI on				✓			x60
LACTULOSE 15ml				✓			x300ml
RIVAROXABAN			Oral	✓	10		x10

Prescriber's signature | Print Name | Bleep No. | Date __/__/__

PHARMACY TO PROVIDE:

Reminder Card ☐ MARS ☐ Counselling ☐ Large Print ☐ No CRC ☐ MDS ☐

Clinical check	Labelled by	Assembled by	Accuracy check
Initial ___ Date ___	Initial ___ Date ___	Initial ___ Date ___	Initial ___ Date ___

SHO11001

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APPENDIX 10

DICTATION STRUCTURE OF REGISTRAR 04

DICTATED DISCHARGE SUMMARY

Name, DOB + Hospital no.

Date of admission
discharge

Dear Dr _____

Reason for admission: Chest Pain / Pneumonia.

Problems: IHD
Hypothyroid
Menieres disease
Constipated

This 79 yr old lady was admitted
from the community / via the A+E dept
with

Medications on discharge

Follow up:

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APPENDIX 11

A FULL DISCHARGE SUMMARY EXAMPLE FROM A PATIENT CASE

Hospital ....

Admitted: 30.4[REDACTED]
Discharged: 6.5[REDACTED]

Dear Dr [REDACTED]

Diagnosis: Gastroesophageal reflux disease, ischaemic heart disease

Drugs on discharge: Aspirin 75mg od, Atorvastatin 10mg at night, Bezafibrate MR 5mg at night, Thyroxine 50mcg od, Atenolol 25mg at night, Ramipril 1.25mg od, Isosorbide Mononitrate 30mg bd, Lansoprazole 30mg at night.

Follow up: Nil

Comments: This lady who is known to have ischaemic heart disease was admitted with a further episode of central chest pain which came on in the middle of the night. On arrival at hospital she was well and her pain had settled. Myocardial infarction was excluded by a normal series of cardiac enzymes, however she continued to experience nocturnal chest pain which proved rather refractory to treatment. She was commenced on a proton pump inhibitor as it was felt that her pain may be due to gastroesophageal reflux disease rather than cardiac pain and she had a good response with no further recurrence of her night time pain.