

Discharge Summary Communication from Secondary to Primary Care



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Abstract

.....

Studies were conducted in Nottingham, UK to assess quality of discharge summary communication sent from secondary to primary care using updated processing methods.

Objectives (1) Assess available evidence on effectiveness of interventions aiming to improve discharge information communication specifically introducing computerised discharge summaries (2) Assess differences in discharge summary quality using new processing methods (3) Obtain perspectives of secondary care on discharge communication issues, identifying points of weakness and primary care views on discharge information communicated from hospital.

Methods (1) Systematic review of literature on effectiveness of interventions aiming to improve discharge summary information communication (2) Before and after studies of two different discharge summary types in three departments within Nottingham University Hospitals NHS Trust (3) Qualitative interviews with key stakeholders (N=27) and observations in 3 sites.

Results The systematic review returned 21 interventions with emphasis on the introduction of computerised systems to improve quality (timeliness and completeness of discharge summaries). Nine studies significantly improved the completeness of the discharge summary. Ten studies significantly increased the timeliness of the generation of the document and the transfer of information.

The three before and after studies produced varying results; the HCOP findings suggested improvements post-intervention in completeness of summaries; this was not statistically significant. In Nephrology, computerisation significantly speeded up the timeliness of discharge summaries but there was no significant difference in completeness between the two types. In Paediatrics, computerisation increased the number of summaries not completed, and the handwritten summary was significantly faster. Computerised discharge summaries contained more information- this was statistically significant.

The qualitative study identified issues with understanding the concept of discharge, the purpose and importance of the discharge summary, and organisational issues around the ability to balance the demands for completeness and timeliness, a lack of leadership and user-centred design of the electronic discharge system.

Conclusions The literature reviewed found examples of the potential computerisation has on discharge documentation quality. The research studies conducted showed that the introduction of computerisation into the discharge documentation process produced mixed results in quality (completeness and timeliness) of discharge summaries communicated from secondary to primary

care. Slight improvements were found in the before and after studies and staff feedback was positive. The success of such interventions depends largely on increased clinical leadership and user-centred design. An established link to patient safety is needed to increase awareness of the importance of discharge summary communication and justify major system change.

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Glossary

CfH	Connecting for Health
CfHEP	Connecting for Health Evaluation Programme
CRS	Care Records Service
EDS	Electronic Discharge Summary
HER	Electronic Health Record
HCOP	Health Care of Older People
NHS	National Health Service
NotIS	Nottingham Information System
NpfIT	National Programme for Information Technology in the NHS
NUH	Nottingham University Hospitals Trust
PACS	Picture Archiving and Communication System
PCT	Primary Care Trust
QMC	Queen's Medical Centre, Nottingham
RCP	Royal College of Physicians of London
SPSS	Statistical Package for Social Sciences v.16
SPINE	NHS Connecting for Health Collection of Service Applications for Data Exchange
TTO	To Take Out (Discharge Medications List)

Chapter 1- Introduction

1.1. Discharge Communication Between Care Sectors

Hospital care is continuously increasing in complexity, and this is compounded by the ever-increasing speed in which care is expected to be delivered, the number of health care professionals involved in the care of the patient, and the high quality standards that are required (Department of Health, 2003, 2010; Care Quality Commission, 2011).

Discharge of inpatients provides opportunities for communication between health care professionals when the information on the patient's hospital stay is sent out of the hospital to primary care. However, this transition has been acknowledged as an area that poses numerous challenges and can impact on patient safety (Dunn and Markoff, 2009; Linder et al, 2007; Crosswhite et al, 1997). Communication surrounding the discharge of patients from a stay in hospital is fraught with difficulties in transferring the correct information in a timely and efficient manner and has potential for error and a risk of adverse events to the patient (Macaulay et al, 1996; Department of Health, 2010).

When the patient is admitted to hospital to be cared for by health care professionals, tests and investigations are performed, procedures may be carried out, new diagnoses established, treatment given, and medicines may be commenced, stopped or altered.

Primary care therefore, must be made aware of the admission episode and any details of the care given in hospital, to be able to carry on the care of the patient in as seamless a transition as possible. This is especially important for certain patient groups such as the elderly and chronically ill or other

vulnerable groups who need continued follow-up (Archbold et al, 1998; Carey et al, 1999; Cortes et al, 2004).

1.1.1. Quality of Discharge Summaries

The details of the patient's hospital stay are typically documented on a "discharge summary"; the discharge summary document is expected to be the vehicle used to convey information from hospitals to primary care. However, the discharge summary is often problematic; this is due to the complexity that underpins what is mistakenly seen as a simple task (Dedhia et al, 2009). There is a real need to focus more attention on the discharge document and its associated complexities.

There are several aspects which could potentially make discharge communication effective: the timing of dispatch of the document and receipt by the next point of care, the content included, the format of the document, the mode of transmission, the collaborators in the compilation of the document and the direction of the communication (Closs, 1997; Department of Health, 2010; Health Committee on Patient Safety, 2011).

Currently, there is disagreement as to what information needs to be on a discharge summary, and the difficulties in the ability to balance between providing what is needed quickly and comprehensively (Branger et al, 1992; Cortes et al, 2004; De Clifford et al, 2009). In terms of the content of discharge summaries, there is an apparent conflict between formally issued standards and guidance and what health care professionals as the recipients and users require or deem necessary. In 1989, the Department of Health issued a statement as to what was officially required to be included on communications from hospital doctors:

"In writing and by telephone, notify patient's GP of date of discharge, relevant diagnosis, appropriate medication, patient management required and follow-up arrangements made in time for the GP to take appropriate steps, as well as arrangements being made for follow-up care, and arrange for a formal discharge letter to be sent to the GP as soon as possible, and a discharge note to be forwarded to the GP in cases where the GP needs to see the patient immediately." (Closs, 1997)

There has been much written on the viewpoints of various users on the subject (Solomon et al, 1995; Adams et al, 1993) regarding what is considered most important on the discharge summary. Some recipients want summaries to be brief due to time constraints in the workday (Dunn and Markoff, 2009; O'Leary et al, 2009; Myers et al, 2006; Solomon et al, 1995), however others assert that details of the initial diagnosis, information given to the patient, dates of admission and discharge, lists of medications list, and details of any investigations conducted during the hospital stay are the most important items that need to be present on a discharge summary (Crosswhite et al, 1997; Archbold et al, 1998; Carey and Hall, 1999). Others state their preference for additional details of drugs at discharge, investigations and results, follow-up arrangements, and any information given to patient on diagnosis (Adams et al, 1993; Solomon et al, 1995). The items that rank highly in terms of importance are the patient details, followed by admission and discharge dates, diagnosis, surgery, other treatments, investigations, follow-up arrangements, out-patient appointments, medications and information on the doctor in charge of completing the discharge summary (Closs, 1997, Kripalani et al, 2007).

More recently in 2008, The Royal College of Physicians of London issued standards for the structure and content of medical records (including discharge documentation). The Health Informatics Unit worked in consultation with a wide variety of health care professionals to develop patient-focused records standards with a view to improve the consistency and quality of information communicated (Royal College of Physicians, 2012). Engaging clinicians and specialists, categories of content were developed to include information on patient, GP, admission and discharge details, as well as clinical information, advice, recommendations and follow-up instructions, and information on the health care professional preparing the document (Royal College of Physicians of London, 2008a,b).

While these requirements and standards have been in effect for some time now, there are wide variations in their application. The Royal College of Physicians may have defined the content required of discharge summaries, but this definition did not extend to the circumstances of the healthcare environment in which they take place, and without that the enterprise is essentially unfinished.

Although it is understood that discharge summaries should be communicated as quickly as possible, this presents a grey area (Care Quality Commission, 2011; Barr, 2010). One of the main issues is how to shorten the time lag between the completion of the discharge summary and when it reaches Primary Care. This is directly affected by the time taken beforehand by the health care professional to complete the task of compiling the discharge summary, and can affect the quality of the document and the communication of information. Health care professionals' ability to complete timely discharge documentation will be affected by staffing resources. Health care professionals have to work in an increasingly complicated hospital environment, and they

are required to meet conflicting demands of the patients at hand with the patients waiting to be admitted (Dunn and Markoff, 2009; Macaulay et al, 1996).

The Department of Health in the UK has now set the standard for completion of discharge summaries, as of April 2010 requiring hospital departments to transmit these documents to the Primary Care Physician within 24 hours of the patients leaving the hospital (Department of Health, 2010).

There are also issues surrounding the responsibility for performing the task of completing discharge documentation. There may be a number of people involved in the care of the patient due to increased specialisation within the hospital teams, and each specialist may have specific details with regards to diagnoses, treatments, procedures and tests carried out as well as follow-up instructions that need to be added to the patient record and potentially used to compile a discharge summary for the next point of care. The task may fall to the senior clinician in charge, the house officers, the junior doctors, nurses or the secretaries, or a combination of staff, or require the input of a pharmacist. This can affect the timing and therefore the quality in producing the discharge summary document (Cortes et al, 2004; Herbermann, 2000).

The issue then becomes the preparedness of such junior staff in completing the discharge summary task. Junior doctors are placed before this task without having any particular formal training to support them (Myers et al, 2006), and there is rarely an availability of teaching, guidance and instruction. Few Senior House Officers (SHO's) had received formal undergraduate or postgraduate training, others received some brief instruction from a consultant, and others received written guidelines (ibid). There is often little or no feedback from consultants as to the quality of the

completed discharge summary (Frain et al, 1996). In one case, staff was instructed to begin using a new electronic discharge template via an e-mail message and had no further specific training (O'Leary et al, 2009). Contrastingly, another showcased a comprehensive deployment and training program most relevantly composed of IT support, staff training and availability, which had a high level of attendance (Sequist et al, 2007).

There are issues in the efficient use of junior doctors rotations, as when they are tasked with writing summaries, they may be completing a document for a patient they have not cared for, and require assistance to complete the summary. This can lead to a discontinuity of care (when a health care professional may write a discharge summary for a patient they have not seen) or time delays while information is compiled by the various individuals or teams.

The resources available to the health care professional when attempting to complete discharge summaries can also adversely affect hospital discharge communication. This includes the availability of support and secretarial staff to transcribe dictated discharge notes and letters, or the availability of the necessary patient records or case notes or hardware and equipment needed to create the discharge summary.

There is a great deal of variability in the methods and processes by which the document is created and transmitted out of the hospital. There are many studies that have attempted to develop and implement interventions aiming to improve the discharge communication process within their remit, in order to better meet these requirements and standards, and increase the quality; continuity and safety of care that is provided to the patient. These studies are considered in more detail in Chapter 3-Systematic Review of Literature.

1.1.2. The Importance of a Quality Discharge Summary

If the information on the discharge summary is lacking (i.e. not compiled or insufficient) or inappropriate (i.e. incorrect or not sent out and received by the next point of care in time), the user is unable to depend on that information to carry on the patient's care, and has to rely on the patient as a source of information or contact the hospital for more information.

Several studies have highlighted the dangers of inadequate communication when transferring a patient from one care sector to the other. Some have evaluated the contribution of incomplete discharge information on rates of readmissions or deaths. Witherington et al (2008) examined the records of patients readmitted to hospital within a month and found that 28% of readmitted patients returned to hospital within 72 hours of being discharged, 44% within a week, and the remaining 28% within 28 days. Sixty two percent did not have a discharge letter issued before the patient was readmitted. An expert panel review of the case records considered that 38% of re-admissions were related to incomplete information on medication changes, that were deemed to be preventable in 61%, and that communication gaps at discharge were preventable in 54% (Witherington et al, 2008).

A second study found that while 77% of the Primary Care Practitioners were aware that they had a patient admitted to hospital, only 23% had direct communication with the hospital (i.e. a telephone call). For 42% of the patients admitted, a discharge letter was available to the Primary Care Practitioner within two weeks. The study found that 22% of the patients had either died, visited the Emergency Department or had been readmitted to hospital; however they found no relation between the outcomes of interest and direct communication between the hospital and primary care (Bell et al, 2009).

1.1.3. Improving the Quality of Discharge Summaries

The area of discharge and the corresponding documentation has been the focus of a great deal of interest in the past three decades. Much of the research has attempted to pinpoint the problems and challenges facing the efficiency and safety surrounding discharge communication sent from hospital to primary care. While there have been attempts to rectify the matter by changing various aspects, discharge summary communication remains problematic.

Worldwide there has been an increase in the belief in modern technology and computerisation as the way to improve the quality of health care services (Archbold et al 1998; Crosswhite et al, 1997; De Clifford et al, 2009) and there has been a major shift in health care organisations towards the installation and implementation of electronic systems for the recording and management of patient data (Balaban, et al, 2007; Branger et al, 1992 and Eden et al, 2008).

Emphasis has been placed on the necessity to upgrade to electronic data management and hospital records to secure patient data, to ensure control and assure that all details are maintained and are easily accessible when needed (Eden et al, 2008). There is potential for electronic systems to provide the basic structures to underpin safe and effective information transfer from hospital to the GP (O'Leary et al, 2009; Crosswhite et al, 1997). As more and more hospitals implement Electronic Patient Records (EPS), there is more scope to develop and standardise documentation, and provide the ability to put together the most relevant parts of the record to form a discharge summary. The new IT has much potential to improve the methods of information communication (O'Leary et al, 2009; Closs et al, 1997; Crosswhite et al, 1997).

Hospitals are now incorporating electronic transfer of the documents into routine hospital practice and there is a necessity to find out how the users see these changes and understand any difficulties faced in order to make the electronification process a success. It is crucial to address any problematic issues, as electronic discharge summaries are potentially associated with quality improvement this is worthy of in-depth research to identify the availability of hard robust evidence on this association.

It is interesting to consider the effect that electronic records and data management (or mismanagement) may have on communication of information being sent out of hospital. The effect the introduction of technology has on the process of documentation of patient information, and the impact on the health care professional's workload are issues of concern. They are important to consider, as electronic records may have a detrimental effect on the quality of discharge summary communication.

In order to overcome the difficulties in communicating discharge summaries from hospital to primary care, it is necessary to verify the process of discharge as it occurs; specifically the steps needed to compile and transmit discharge summaries, as well as pinpoint barriers to this occurring efficiently and quickly, by obtaining the perspectives of the involved health care professionals.

1.2. The Research Project

The focus of the PhD research was the Nottingham University Hospitals Trust, as an example of an Acute NHS Trust attempting to increase quality of care and meet National Standards and expectations in introducing electronic discharge and computerising documentation, working in conjunction with the surrounding Primary Care Trusts.

1.2.1. Contribution to the Knowledge Base

Governmental shifts of policy have altered the course of the National Programme for IT in the UK and England specifically, with the NHS plans for IT coming under threat of serious budget cuts impacting the roll-out and impetus for the universal care records systems that were planned for implementation (Department of Health, 2010). Instead, local health communities across England are being allowed to develop and select parts of the computer systems to install locally (Nottingham University Hospitals Trust, 2011).

As part of the drive to incorporate electronic discharge into routine care, Connecting for Health has most recently developed an Electronic 24-Hour Discharge Summary Implementation Toolkit; to assist NHS Trusts to implement electronic discharge locally (Connecting for Health, 2012) providing a nationally agreed discharge summary. Within this context of the NHS plans for modernisation and IT (Department of Health, 2010), the multiple factors discussed in this chapter affect the potential to achieve the benefits expected of electronic systems in timeliness and completeness, but these have not been extensively explored. The complexity of the issue of discharge communication and the results of previous research leaves much to be understood in terms of the true potential of technology to increase the quality of discharge summary communication. There is a need to assess the currently available evidence on the quality (completeness, timeliness) and therefore the safety of various methods of preparation and transmission of discharge summaries.

1.2.2. The Aim

The research project aimed to learn from the experience of a large UK teaching hospital's (NUH) attempt at moving from traditional processes of

creating and transmitting discharge information and documentation to more standardised and technologically advanced (electronic) methods of communicating discharge information and understand the barriers to achieving the expected quality gains.

1.2.3. The Objectives

To achieve this aim, three studies were designed to meet the following defined objectives:

- 1) A systematic review of literature: to identify and assess the available evidence on the effectiveness of interventions that aimed to improve discharge information communication specifically with the introduction of electronic discharge summaries.
- 2) A before and after study series: to assess differences in quality of discharge summaries using new methods of discharge summary processing.
- 3) A qualitative study: to obtain the perspectives of secondary care on current discharge communication issues, identifying points of weakness or areas of concern from their perspective, and assess primary care views on discharge information communicated from hospital.

For the purposes of this research project, the term “electronic” is used to refer to all aspects relating to the incorporation of technology; introducing computerisation into the discharge process from the use of a computer database to the transmission of documentation via electronic mail.

1.3. Brief Summary of the Thesis Structure

The next chapter explains the methodology behind the doctoral research. The third chapter details the systematic review of literature on the effectiveness of interventions aiming to improve the quality of discharge summaries,

specifically the content of discharge documentation and the timeliness in which this information is transmitted.

The fourth chapter specifies the before and after comparison studies undertaken in several hospital departments and their attempts to improve discharge summary documentation by introducing changes to the processes used and modifying the type of discharge documentation.

In the fifth chapter, the researcher (HZ) explains her qualitative experiences in researching the secondary and primary care health care environments; conducting non-participant observations and open-ended interviews with health care professionals in both sectors to obtain their views on the issues surrounding hospital discharge communication.

In the final chapter, the main findings are summarised, and the overall structure and conduct of the research project is considered. The researcher (HZ) also details her views on the perceived strengths and weaknesses of the research project. The chapter contains a discussion of the researcher's views on how the findings link to current knowledge and the implications this may have on the continuing development of health care policy in the area of discharge communication between hospital and primary care, and also puts forward thoughts on how to manage and best improve on actual practice in both the hospital and primary care environments, as health care professionals work with the day to day communication flow between sectors.

Chapter 2- Study Design and Methodology

2.1. Context

This PhD research project was initially undertaken as part of a larger research grant which coincided with the beginning of the PhD research degree programme at the University of Nottingham.

The Division of Primary Care at the University of Nottingham, through Professor Anthony J. Avery (Head of the Division) was one of several University Departments collaborating on conducting a Connecting for Health Evaluation Project (CfHEP 005) titled "A National Evaluation of the Adoption of the Care Records Service (CRS) in Secondary Care in England" (Sheikh et al, 2011). This project had been granted through NHS Connecting for Health (CFH) and was number (005) one of ten concurrent evaluation projects. The evaluation project commenced in April 2008 and was expected to run for a duration of two years, led by The University of Edinburgh, and collaborating with colleagues from Imperial College London, the London School of Pharmacy the London School of Economics and the University of Nottingham. Within the Connecting for Health Evaluation Project (CFHEP 005), one of the main aims was to evaluate the implementation of the Care Records Service (CRS) and use the findings to inform the continuation of the roll-out of the service across England.

2.2. Methodological Approach

Within the aim of the project, the researcher (HZ) endeavoured to understand the complex naturally occurring process of communicating discharge information from hospital to primary care and the effect of implementing

newer methods of discharge summary processing on quality using a mixed methods approach of both qualitative and quantitative elements.

2.2.1. Mixed Methods

The research objectives necessitated a mixed methods approach to conducting the research in order to culminate in the researcher being able to make suggestions for how hospital discharge summary communications could be improved and provide advice and recommendations on areas to be strengthened when implementing changes to NUH electronic discharge and NHS information technology in the future.

Tackling a complex issue such as the one in this thesis conducting research in a healthcare environment required the adoption of a variety of research methods, combining both quantitative and qualitative approaches; collecting and working with different data types, and therefore the research strategy was developed accordingly. This was necessary as the discharge summary communication process is a highly complex one, and thus a variety of sources needed to be gathered and used to shed light on the entire area of interest. The research strategy was developed based on practical choice, reflecting on the nature of research in health care, when the goal is to develop recommendations to inform policy and practice. The highly complex nature of the healthcare service and the feasibility to use certain research methods made it necessary to form the research questions and select methods appropriate to achieve as much as possible within those limits .

The resources available to the researcher from the outset of the degree programme and all throughout made it more practical a choice to use mixed methods to obtain and analyse data as this offered more flexibility, strength and potential to delve into the topic of discharge communication and approach

it from different angles more creatively with the hope of discovering new insights and valuable results. The researcher (HZ) combined elements of qualitative research methods of observations, interviews with quantitative audit methods to support the research questions, integrating mixed methods to derive inferences from the data.

2.2.2. Systematic Review of Literature Methodology

The systematic review of literature described in Chapter 3 focuses on the effectiveness of interventions aiming to alter discharge communication. This review of literature was deemed integral to the planning and implementation of the entire PhD research structure. This formed the underpinnings of the other parts of the research project, and served to answer questions on whether previous attempts had positive or negative impact on key issues of concern, shaping the avenues for further inquiry.

When planning the conduct of the literature review, the various types of reviews were studied. For the PhD project's purposes and capacity, the type of review most suitable would be what was classified as a "systematic review". In their article, Grant and Booth defined various types of literature reviews, among which the systematic review fit the degree of potential diligence and meticulous standards that the researcher (HZ) intended to achieve, and provided the most reasonable yet structured methods that could be used to gain insight into the topic area.

Although fully aware of the gold standard for systematic reviews of literature that is the Cochrane Review, the researcher (HZ) employed realistic expectations for what was feasible and achievable with the resources available as part of a PhD project, and elected to undertake as near as possible to a Cochrane systematic review of literature as was practical.

According to Grant and Booth (2009) the typical systematic review aims to adhere stringently to the specified guidelines to research the evidence exhaustively, and includes a comprehensive quality assessment and entails a team of experts working exclusively and with greater resources such as time and funding. While the systematic review undertaken here does not necessarily adhere to the strict guidelines stipulated in the gold standard of the Cochrane review, still provides the necessary structure and control over the planning, execution and integration of the research that was needed, providing high quality results.

2.2.3. Quantitative Work Methodology

When considering the conduct of research within the hospital environment to compare the previous processes in comparison with the modified processes, similar research studies in the topic area of discharge communication were examined and it was found that the majority had conducted their work using the Before and After study design, rather than Randomised Controlled Trials (see Chapter 3- Systematic Review of Literature).

When considering the different study design types and their methodological strengths, the researcher (HZ) was aware that the gold standard for evaluating interventions is the Randomised Controlled Trial (RCT), and the status of the RCT as such is due to the clear elements of controlled experimentation and the random selection of participants, which ensure that the result of the experiment are a true reflection of the phenomenon being examined, and its generalisability (Evans, 2003). The Randomised Controlled Trial is strong in theory, but in practical applications is complex to design, implement and organise, and is not ideal to represent the true issues of the topic at hand and allow the development of the insights of interest in the hospital environment. Developing an RCT for this research project was not

possible: firstly, the researcher (HZ) was not in a position to design and implement a formal experiment in the form of a Randomised Controlled Trial in the hospital environment within the timeframe for the research project. Secondly, it would not have been feasible to run the project as a randomised trial because of the priorities of the hospital for implementing new approaches for discharge communication.

The Time Series Analysis study type -although also methodologically strong- is more labour intensive, requiring the collection of multiple sets of identical samples at intervals, which was not feasible for this research project. Controlled Before and After Studies while a strong study type to use when investigating outcomes after exposure to specific elements, was not possible for this research study as the researcher (HZ) was studying the implementation of a pre-designed programme of service development, and had no control over the specific exposures or outcomes.

Therefore, the research undertaken was not experimental in nature and the quantitative elements of the research were designed in a way to suit the fact that as a non-NHS researcher, (HZ) was only able to observe and analyse what was already in place in terms of the discharge summary preparation processes in the hospital departments. The implementation of various forms of discharge communication was already taking place as part of the on-going process of service development within the NUH Trust, and these processes were examined using the Before and After Study design.

Given additional resources and control over the implementation of e-discharge planning and procedures, it might have been possible to have done a methodologically stronger study.

2.2.4. Qualitative Work Methodology

The qualitative interviews with health care professionals were a highly iterative part of the PhD, developing over the course of the research degree programme and informed by the Grounded Theory premise (Murphy et al, 1998). The methods selected for this study were chosen to complement those used in the other parts of the PhD research. The methods were selected as appropriate to the research in the field of hospital communications and as suitable to the health care environment, and the most practical with which to achieve the stated objectives for this part of the PhD research project.

The Grounded Theory approach was one the researcher (HZ) felt most drawn to from the outset and this informed the development of the qualitative research part of the project and the generation of the insights from the data. Though not adhering strictly to the Grounded Theory school of thought, the qualitative research incorporated very broad elements of the Grounded Theory approach as its methodological basis; various texts on this were consulted in the time both prior to and during the course of the research, data collection and analysis (Denzin and Lincoln, 2005; Tashakkori and Teddlie, 2003; Pope and Mays 2006; Pope and Mays 2007; and Bryant and Charmaz, 2010).

First to discuss Grounded Theory were Glaser and Strauss in 1967 in a book titled "The Discovery of Grounded Theory" (Bryant and Charmaz, 2010). They believed that it was insufficient to undertake empirical work and merely attach theory; their approach disputes the value of abstract theorising and following that with empirical work to test the theory. They support the idea of the development of concepts from the research, building general understanding, gradually emerging from the data through analysis and a constant comparison of the ideas with the collected data, constantly

improving the concepts emerging by re-checking against newer data collected. The school of thought emphasises the importance of empirical fieldwork, and the need to link the explanation closely to what happens in the practical situations in the real world (observations).

Grounded Theory allows the exploration of new territory and is appropriate for research that focuses on investigating human interactions, practical activities and situations or the participant's points of view. Although the qualitative research described in this project here did not aim to generate a theory on the topic of interest, the school of thought supported the desire of the researcher (HZ) to explore and generate new explanations from studying activities and the need to gather detailed empirical data on working practices.

The use of Grounded Theory entails field data collection throughout the course of the research, "following a trail of discovery" (Pope and Mays, 2006). Each new phase of investigation reflects issues discovered in previous investigations and offers new avenues for exploration. Research usually starts by identifying findings from previous research and using that to decide what is worthy of investigation. But Grounded Theory expects the researcher to start without preconceived beliefs on the nature of the activity to be investigated or how it works (Bryant and Charmaz, 2010). Any previous knowledge or understanding of the topic of interest is provisional; the researcher waits to form their own understanding from the research itself as it progresses. There should be a general perspective or focus in mind, but the area should be studied without preconceived ideas that predetermine the resulting concepts and hypotheses (ibid). This current project entailed the researcher (HZ) entering into a previously unknown environment (as a non-NHS researcher), without knowledge of how discharge processes occur or how health care

professionals perform such tasks, although there was a general focus in mind when embarking on the research.

The researcher (HZ) approached the issue with a fresh perspective, avoiding using previous concepts to analyse the data. While this was challenging, an awareness of the potential to revert to previously held beliefs and understanding was maintained and avoided.

In purely Grounded Theory methodology, a literature review is avoided in fear of contaminating the researchers understanding of the issues. This research project diverged from this belief due to the necessity of performing a wide search for interventions aiming to improve discharge communication (see Chapter 3- Systematic Review of Literature). The researcher (HZ) was inclined to locate other research into the topic area; for the sake of comparison and to inform the background of the electronic discharge implementation plans of NUH NHS Trust (see Chapter 4- Before and After Studies).

The novelty of Grounded Theory lies in the approach to gathering and analysing data. Grounded Theory does not depend on a single type of data collection; it supports the use of a variety of methods to gather data (interviews, transcripts of meetings, proceedings, field observations and other documents such as letters and questionnaires). Most importantly, Grounded Theory prefers the methods that allow for the collection of raw data (interviews with open-ended questions, field notes...).

The selection of sites for the research project needed to fit the developing enquiry. Sites (in this project the Health Care of Older People, Nephrology and Paediatrics Departments) were selected via purposive non-probability type of sampling: deliberately selected for what they offered to the research, chosen

to allow comparison and contrast with previous sites. Following the Grounded Theory approach means the research did not attempt to specify what will be included in the sample, the sample accumulated throughout the conduct of the research. This sampling process was cumulative (adding to previous data to form a strong foundation for the concepts, constantly reflecting and refining) as well as an iterative process. Any event, instance or person interviewed was considered potentially integral to the sample.

This process was by no means random; in fact it was supported by a clear rationale, based on the contribution that any selection might make to the development and refinement of the understanding of the issues being studied. At each stage, the selection criteria was clear, methodical and consistent, yet flexible, allowing the researcher to respond to opportunities that came up from the fieldwork, allowing the exploration of opportunities that presented themselves that had been unplanned, but that appeared potentially useful.

Another element of Grounded Theory is the approach to collecting, coding, and analysing data then deciding what to collect next and where to collect from to continually develop the research. This starts with the raw data (interviews, recordings, field notes, documents) and searches for recurrent themes to support the emerging understanding the issue being studied. The data are coded and categorised, and items are assigned to different categories commonalities located in the interview transcripts. In Grounded Theory codes evolve and are refined as the research progresses. Different approaches to coding may then be used or even combined. In Open Coding pieces of data might be labelled in terms of what they contain. In Axial Coding the code is shaped, and relationships are observed to allow one code to be merged into another, or to take precedence. In Selective Coding, the focus is on significant categories, the core codes vital to explaining the complex topic

being researched. The coding process used in this research project used a combination of the coding approaches, and aimed to develop concepts that explains the issue of interest. As the research progressed, certain categories became more central to the analysis than others and were investigated in more depth (Denzin and Lincoln, 2005).

The "Constant Comparative Method" is a means for data analysis, and entails a commitment to comparing and contrasting new codes, categories and concepts as they are formed, constantly reflecting and refining, improving the explanatory power of the concepts generated by the data (Pope and Mays, 2006). This was done in this research project by looking for similarities and differences, integrating categories and codes under common headings (reducing to the simple elements) as they emerge, therefore verifying it as it was taking shape rather than after). There are benefits of the constant comparative method: the researcher does not lose sight of the data, and the analysis never drifts away from reality. The concepts and understanding that is developed are closely linked to the data origins; remaining "Grounded" (Bryant and Charmaz, 2003).

There are disadvantages to using Grounded Theory. Firstly, the methodology does not allow for precise planning from the outset of the research project. Instead the development of the project is more of a gradual process; this has a cumulative effect once the data begins to accumulate and analysis commences. Secondly, the Grounded Theory approach does not lend itself to predictions of what, who or how large the sample will be, instead advocating the continuing data collection data until clarity is achieved. Thirdly, focusing on specific items in the research setting, there is a danger of missing some of the broader contextual factors, ignoring the influence of social, economic and political factors as well as crucial historical background of the issue. Fourthly,

it is very difficult for researchers to approach an issue with a clean slate; without falling into preconceived notions and beliefs. These disadvantages are issues which the researcher became more aware of as the research project progressed, and strived to remain mindful of throughout.

The issue of reflexivity was also carefully considered and maintained; the researcher's experience affects the research that is undertaken, and the research will affect the researcher. Awareness of this issue had to be developed and taken into consideration as the qualitative research progressed; when collecting new data and adding to the cumulative results of the research project and understanding of the complexity of the topic of discharge communication the researcher (HZ) strived to remain objective and view the data as objectively and purely as possible, limiting the influence of the overall experience on the first analysis, but then allowing these experiences to inform the general context of the health care service environment.

The analysis of the data was a complex process, and the researcher endeavoured to analyse the data systematically but allow enough flexibility to let the inferences emerge fluidly. The researcher (HZ) maintained consciousness of the use of the inductive methods characteristic of the Grounded Theory approach, beginning with the observations and building up an understanding of the ideas to enable more general statements to emerge then consider them further on the basis of newer observations and interviews.

The research was therefore iterative in the approach to both its conduct and analysis, yet designed to facilitate a clear connection between the parts of the PhD, with the intention that they must complement each other.

2.3. Ethical Approval and Permissions

Ethical approval for the planned research and data collection was sought and gained under the umbrella of the larger service evaluation (CfHEP005) being undertaken within the Department of Primary Care at the Medical School.

The CfHEP 005 was considered by the East London and The City Research Ethics Committee 1 and was classed as a "service evaluation" [Aziz Sheikh, University of Edinburgh, personal communication, 2008]. As this PhD was conducted under the umbrella of the larger project, it did not require a separate ethics application and approval.

Nevertheless, the researcher (HZ) did obtain Research and Development approval from Nottingham University Hospital NHS Trust, and Nottinghamshire County Teaching Primary Care Trust. Appropriate permissions were then secured from the Trusts; in the form of an honorary contract and authorisation to conduct interviews and observations in both secondary and primary care.

The honorary contract was initially obtained in early 2009 for the research to be conducted under the supervision of a consultant within the pilot study site; this was subsequently renewed in early 2010 for a further year in which to collect and analyse data for the study from other sites within the Trust, under supervision of consultants from those sites. Permissions and access to the sample of patient records for the pre-post comparison were granted by the relevant authorities such as the Department Consultants, Case Note Librarians, The Research and Development Unit and the Clinical Audit Office (Clinical Governance) within the Trust.

A complete dossier of required forms and paperwork was prepared in anticipation of the submission for ethical approval to conduct interviews in primary care, however upon inquiry with the Research and Governance Offices [e-mail communication] the researcher (HZ) was informed that a full ethics approval application was not necessary as the sample-size requested was not large scale enough to warrant a full process. The research also did not involve access to patients and other accompanying issues; therefore the permission was obtained to interview general practitioners in the Nottinghamshire area from the Nottinghamshire County Primary Care Trust.

2.4. Information Technology Training

Two training sessions were undertaken at the ICT services department in February 2009 in order to grant the researcher (HZ) with appropriate permissions (usernames and passwords) for the hospital information systems Nottingham Information System (NotIS) and Picture Archiving and Communication System (PACS). The researcher (HZ) then spent time learning how to access the information system software and navigate to locate appropriate information and the required data for the research.

2.5. Resources

Resources needed for the completion of this work included tuition and student expenses. The researcher (HZ) was a recipient of a full government sponsorship from the Ministry of Higher Education in Saudi Arabia "The King Abdullah Foreign Scholarship Programme", which covers tuition fees for the full three years of required full time registration with the University of Nottingham, as well as providing a monthly stipend which covers living expenses, books, transportation, academic materials and health insurance. Other resources included time, and electronic resources (computer, audio

recording devices, transcription devices, and word processing and database management skills, paper, printing, filing and archiving). Travel expenses periodically incurred were covered by the CFHEP 005 Project Grant in agreement with the Supervisor. Monthly meetings with the Supervisor(s) were held, arranged between the student and the Supervisor(s) in advance.

Chapter 3- A Systematic Review of Literature on the Effectiveness of Interventions Aiming to Improve Discharge Summary Communication

3.1. Background

In keeping with the research project aims and objectives outlined in Chapter 1, a systematic review of literature was conducted to assess studies that aimed to improve on discharge communication from secondary to primary care.

3.2. Objectives

The objectives were to:

- 1) Ascertain the effectiveness of these interventions in improving the quality (timeliness and completeness) of discharge communication.
- 2) Specifically assess the studies that examined switching from traditional methods of completing discharge summaries to methods that are technologically advanced for impact on quality.

3.3. Methods

3.3.1. Systematic Review Criteria

3.3.1.1. Study Type

Randomised controlled trials, controlled before and after studies, interrupted time series and before and after studies were considered for inclusion in the review. Systematic reviews of literature on discharge communication were also included in the review.

3.3.1.2. Participants

The types of participants of interest were: hospital inpatients as those whose care is affected by discharge communication, secondary care health

professionals and staff, those creating and communicating discharge information, and primary health care professionals as the users and recipients of discharge communication.

3.3.1.3. Interventions

Studies were included that addressed information transfer or communication from secondary to primary care, electronic or other methods of communication and preparation of discharge documentation, and the testing of new processes or methods of communicating discharge information.

3.3.1.4. Outcome Measures

The primary outcome measures of interest were quality of care as manifested in timeliness and completeness of discharge summary information communication. The secondary outcome measures of interest were readmission or re-hospitalisation, or ease of use (including workload).

For the purposes of this review, "completeness" was defined as elements of discharge that affected the number of discharge documents completed in hospital, transmitted to primary care, as well as the amount of information included (content). "Timeliness" was defined as the interval between decision to discharge and the generation of a summary, or the discharge of a patient and summary generation, or the generation of the summary and transmission to primary care, or receipt by the general practitioner.

3.3.2. Data Sources

A search of four electronic databases was conducted: MEDLINE (1980 through May 2010), CINAHL (1937-May 2010), HMIC (1983-May 2010), and EMBASE (1947-May 2010). A manual hand search of the bibliographies of the articles retrieved from the electronic databases was also undertaken.

3.3.3. Search Strategy

Advice was sought from an experienced medical librarian (WS) on database selection, search term selection, construction of the search strategy, and search conduct. The search terms were then combined systematically to search for studies, modified according to each databases' unique requirements.

It was deemed necessary to use over-inclusive terms to help ensure that all relevant studies were identified, but it was also necessary to avoid an unmanageable number of articles being selected. Therefore, an iterative approach to the search strategy was undertaken using different combinations of search terms. The results of these searches were reviewed in terms of the number of articles identified and whether relevant studies were identified, including those known by the research (HZ) and her supervisors at the outset of the review .

The final search strategy incorporated keyword search using MeSH terms, Boolean terms (and/or), truncation characters, trees (subheadings) and permuted indices (see appendix A-1). Four categories of search terms were systematically combined in each of the electronic databases searched. During each search the following combinations were performed:

A: Setting (Hospital OR General Practitioner)

B: Intervention (Discharge OR Communication OR Electronic OR Information OR Process)

C: Patient Group (Patient)

D: Outcome (Safety OR Complete OR Quality)

Finally the categories were combined as follows: **A** (Setting) AND **B** (Intervention) AND **C** (Patient) AND **D** (Outcome) (see appendix A-1).

3.3.4. Study Selection

Stage 1

The researcher (HZ) systematically searched through the electronic databases using the search terms and combinations described. The researcher (HZ) scanned the resulting list of electronic titles and citations in each of the four databases to determine preliminary inclusion or exclusion according to pre-set criteria.

At this stage, the researcher excluded any study that did not address the topic of interest; applying exclusion criteria. Items that did not discuss discharge communication from hospital, inpatients, quality of care as affected by discharge communication were excluded. Language was restricted to English due to time constraints. Selected citations were downloaded into an electronic reference manager (Endnote X1) and duplicates were removed (see Fig.1. Search Strategy Diagram).

Stage 2

The list of titles selected and their abstracts were then assessed and categorized by the researcher (HZ) assisted by a collaborator (SA). Inclusion criteria were stringently applied; studies had to address the topic of information transfer or communication from secondary to primary care, electronic or other traditional methods of preparation of discharge documentation, specific to hospital inpatients. Interventional studies (randomised controlled trials, controlled before and after studies, interrupted time series and before and after studies) testing new processes or methods of

communicating discharge information were included. Systematic reviews of literature were also included. A short list was developed.

Stage 3

The articles shortlisted were retrieved electronically or through inter-library loan and read carefully. The bibliographies of the retrieved studies were reviewed and any relevant additional titles were also retrieved (see Fig.1). Inclusion criteria were reapplied (particularly in terms of the type of study) to arrive at a final list of articles to be included in the systematic review. A study of methodological quality was also conducted (see 3.4.3. and appendix A-4).

3.3.5. Data Abstraction

The data were abstracted into a tabulated format from the articles selected as to the setting, sample size, methods and findings, specifically with regards to the quality of discharge communication (timeliness, completeness) (see data abstraction tables in appendix A-3). The studies finally included in the systematic review were then characterised (see study characterisation in appendix A-2).

3.3.6. Data Synthesis and Meta-Analysis Considerations

When synthesising the results of the systematic review, careful consideration was given to the potential to conduct one or more meta-analyses. The studies included in the systematic review were assessed in terms of homogeneity of study interventions and outcomes. An examination of methodological quality was undertaken to enable an informed decision on the appropriate methods to synthesise the results of the systematic review (see appendix A-4).

3.4. Results

In Stage 1, 1224 electronic citations were identified from the database search. In Stage 2, 65 articles were shortlisted. Upon reviewing the list of titles and stringently reapplying the inclusion criteria to locate intervention studies, it was determined that a total of 17 met the inclusion criteria initially (see Fig.1.Search Strategy Diagram). A hand search of the bibliographies was conducted, which yielded an additional 8 articles to be included. Conducting a comparison of this review with another located in the search (Kripalani et al, 2007) yielded 9 more articles, giving a total of 34 articles. Data were extracted from these 34 articles into tabulated format (see appendix A-3). Of these 34, only randomised controlled trials, time series, controlled before and after studies and before and after studies were finally selected for inclusion in the systematic review (N=21) and a single systematic review of literature was identified (N=1). The total number of studies finally included in the systematic review was 22. Data from these studies was then characterised and synthesised into the review (see appendix A-2).

The studies encompassed a wide range of efforts being made to improve discharge communication from secondary to primary care. These included:

- increasing patient involvement (Coleman et al, 2006; Sandler et al, 1989)
- changing staff roles for the people responsible for the task of creating the discharge summary (De Clifford et al, 2009; Preen et al, 2005; Vira et al, 2006)
- influencing workplace culture (Dedhia et al, 2009)
- modifications of the summary format and content such as standardisation, and the introduction of computerisation (Balaban et al, 2007; Branger et al, 1996; Crosswhite et al, 1997; Curran et al, 1992; Eden et al, 2008; Mant et al, 2002; O'Leary et al, 2009; Olsen and Adamek, 1995;

Paquette-Lamontagne et al, 2001; Rao et al, 2005; Sands and Safran, 1994; Smith and Holzman, 1989; Van Walraven et al, 1999; and Wood and Campbell, 2009).

3.4.1. Location of Studies

The included studies consisted of original research conducted in various countries:

- the USA (N=10, Balaban, 2007; Coleman, 2006; Crosswhite, 2007; Dedhia, 2009; Eden, 2008; O'Leary, 2009, Olsen, 1995; Rao, 2005; Sands, 1994; Smith, 1989)
- England (N=1, Sandler, 1989) in Ireland (N=1, Curran, 1992)
- Australia (N=4, De Clifford, 2009; Mant, 2002; Preen, 2005; Wood, 2009)
- the Netherlands (N=1, Branger, 1998)
- South Africa (N=1, Couper, 1996)
- Canada (N=3, Paquette-Lamontagne, 2001; Van Walraven, 1999; Vira, 2006).

3.4.2. Types of Studies

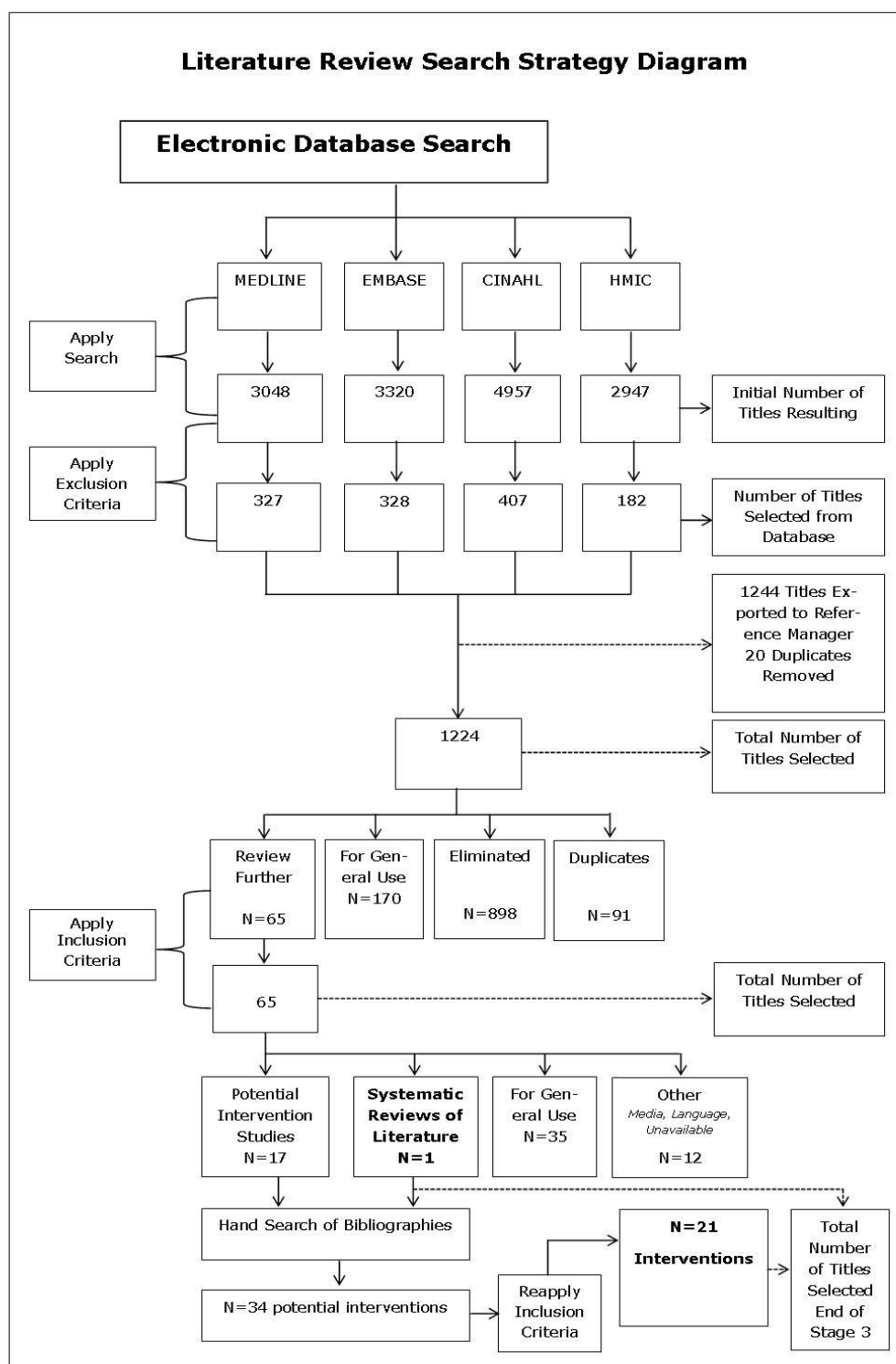
The intervention studies included:

- Randomised controlled trials (N=5): Balaban (2007), Coleman (2006), Preen (2005), Sands (1994), Van Walraven, (1999)
- Controlled before and after studies (N=8): Paquette-Lamontagne (2001), Branger (1998), Sandler (1989), Couper (1996), Dedhia (2009), Vira (2006), Mant (2002), Wood (2009)
- Time series analyses (N=2): De Clifford (2009), Curran (1992)
- Before and after studies (N=6): Crosswhite (1997), Eden (2008), O'Leary (2009), Olsen (1995), Rao (2005), Smith (1989).

In addition, the one systematic review of literature included was Kripalani (2007).

The research publication dates went as far back as 1989. The systematic review was constructed using the Review Manager 5 Software from the Cochrane Collaboration®.

Figure 1. Literature Review Search Strategy Diagram



3.4.3. Study of Methodological Quality

As part of the assessment of the systematic review findings, a study of methodological quality was undertaken, with a view to thoroughly examine the identified literature and the strength of the findings therein.

As part of Stage 3 in the search, the researcher (HZ) critically appraised the studies listed for methodological quality (the type of study and its strength, the intervention methods, and outcomes of interest and the results (see appendix A-4).

The researcher (HZ) made an assessment of the included studies in terms of how the methodological quality affected the validity, reliability and generalisability of the studies' findings.

In terms of validity, several studies were limited by methodological weaknesses. Although a number of studies asserted to be "interventional" controlled before and after studies, these did not provide figures of the pre-intervention group(s) in their reports (Sandler et al, 1989; Vira et al, 2006).

Several studies did not provide statistical evaluation of parts of their findings (Olsen and Adamek, 1995; Sands and Safran, 1994; Sandler et al, 1994; Vira et al, 2006; Branger et al, 1992; Curran et al, 1992; De Clifford et al, 2009; Wood and Campbell, 2009). This was an issue affecting their reliability and validity.

In terms of generalisability (or external validity) the findings of the studies, while to some extent affected by the limitations imposed by the issues with the internal validity, can nevertheless be usefully generalised to other health care organisations and departments to inform their modifications of the

discharge communication process, but this must be taken with the consideration of the types of health care organisations (National in the UK vs. private or managed care in the USA), or very focused on a particular population; Eden et al (2008) focused only on the maternity unit- factors which limits the generalisability of the findings.

3.4.4. Primary Outcomes Assessed

3.4.4.1. Completeness

Twelve studies attempted to improve the content of discharge summaries. These studies included randomised controlled trials (N=1: Van Walraven et al, 1999); controlled before and after studies (N=5: Couper and Henbest, 1996; Mant et al, 2002; Paquette-Lamontagne et al, 2001; Sandler et al, 1989 and Vira et al, 2006) a time series analysis (N=1: De Clifford et al, 2009) and before and after studies (N=5: Crosswhite et al, 1997; Eden et al, 2008; O'Leary et al, 2009; Olsen and Adamek, 1995; and Rao et al, 2005).

The studies used various methods to identify and arrive at the items of content and information that should be included on the hospital discharge documents. The studies included attempts at introducing re-designing the discharge summary (Paquette-Lamontagne, 2001), establishing minimum datasets (Mant et al, 2002), using previously published literature on electronic discharge (Couper and Henbest, 1996), conducting surveys with hospital and community health care professionals on using computerised methods (Sandler et al, 1989), and inviting panels of health care professionals and experts to collaborate on the development of the electronic discharge document (Crosswhite et al, 1997).

Computerisation in the Interventions

Incorporating elements of computerisation, the studies by Crosswhite et al (1997), Eden et al (2008), O'Leary et al (2009), Olsen and Adamek (1995), De Clifford et al (2009) and Van Walraven et al (1999) all introduced the use of an automated or computerised database or patient record system to assist in the generation of the discharge summary to improve elements of content.

Van Walraven et al (1999) conducted a randomised controlled trial and found that with the use of the electronic database to generate discharge summaries, summaries were more likely to contain the items of interest preferred by the general practitioner. Certain items were assessed to be significantly more frequently present on the database generated discharge summaries (chief complaint: 97% pre-intervention 100% post-intervention, $p=0.19$; past medical history: 86.7% pre-intervention 100% post-intervention, $p=0.001$; pre-admission medications: 66.3% pre-intervention 100% post-intervention, $p=0.001$; results of admission physical assessment: 87.2% pre-intervention 99.1% post-intervention, $p=0.001$; discharge diagnosis: 65.1% pre-intervention 100% post-intervention, $p=0.001$; discharge medications: 93% pre-intervention 100% post-intervention, $p=0.006$, planned follow-up 95% pre-intervention 100% post-intervention, $p=0.57$) The study proposed this improvement was due to the database forms prompting staff to include these items such as diagnosis, medications and follow-up instructions.

De Clifford et al (2009) conducted a time series analysis in which the intervention was based on an electronic script-transcription service initiated by a pharmacist upon patient discharge from hospital, to reduce the number of prescribing errors on the discharge summary. The intervention combining the pharmacists expertise with the medication safety elements of the

computer system resulted in a reduction of the number of errors with medications (0.83 errors per patient pre-intervention vs. 0.1 errors per patient post-intervention $p=0.0005$).

Crosswhite et al (1997) conducted a before and after study introducing an automated process to generate a multi-disciplinary discharge summary, by putting together a team to assess the older manual discharge process and develop a way to improve medication documentation on the summary. The system was designed to allow various professionals involved in the care of the patient to input information to a central database. The outcomes of interest were clarity, completeness and timeliness of the discharge summary, and this was evaluated according to five indicators agreed upon (discharge medications included needed to match those in the patient notes, medications listed obtained from prescriptions, medications listed agreed with dictated physician summary, charts reviewed that contained medications addressed by physician, and charts reviewed that contained medication without physicians orders). There was no improvement in these outcomes found (97% of discharge summaries were completed in 1994, and 98% were completed in 1995). No statistical figures were given for this study.

The before and after intervention study by Eden et al (2008) attempted to improve the content of discharge summaries through optimising efficiency of the health care staff, introducing the use of the Electronic Healthcare Record to record patient data that could then be used to generate the discharge summary. The study compared paper documentation with that developed using an electronic patient record, and found that paper records were more likely to miss clinical information (e.g. 23% of patient medical history was missing from paper records compared to 1% of electronic records, $p<0.0001$). However the study did find that social history was more likely to be recorded

on paper documentation (2% missing on paper records for all measures, smoking status missing in 8% of electronic records, alcohol use 11% missing, drug use 16% missing, $p \leq 0.005$).

O'Leary et al (2009) also introduced an electronic system to improve the presence of certain items of content on the discharge summary. The before and after study found the introduction of the system improved the content of the summaries significantly when compared with previous processes. Information on follow-up improved from 52% pre-intervention to 75.8% post-intervention ($p < 0.001$). Information on pending test results improved from 13.9% pre-intervention to 46.3% post-intervention ($p < 0.001$) and the information provided to the patient at the time of discharge improved from 85.1% to 95.8% post-intervention ($p < 0.001$).

Olsen and Adamek (1995) conducted a before and after study that introduced a new template for the discharge summary that was to be transmitted via fax, replacing the previous system of communicating discharge information via telephone, with the aim of improving the comprehensiveness of the discharge information communicated. This was tested comparing the number of telephone calls to follow-up on missing information between the hospital and primary care (18 calls for 16 patients pre-intervention, average 1.1 calls per case, range 0-5). The study found that with the fax transmission, information was more complete and accurate than the information communicated over the telephone (4 calls for 15 patients post-intervention, average 0.3 calls per case, range 0-1). There was no statistical assessment of these results given in this study.

Non-Computerised Interventions

Conducting intervention studies that did not use elements of computerisation or technology, the studies by Couper and Henbest (1996); Mant et al (2002); Rao et al (2005); Paquette-Lamontagne et al (2001); Sandler et al (1989) and Vira et al (2006) introduced elements of standardisation, re-design of the discharge summary document, and increased staff or patient involvement, with a view to improve the content of the summary.

Couper and Henbest (1996) in their controlled before and after study were in favour of standardisation by use of a proforma, or template to decrease staff workload, improve the comprehensiveness and provide guidance to the healthcare professional of what to include. The study found that after the introduction of the proforma, information on patient management in hospital increased significantly (56.3% pre-intervention vs. 76.7% post-intervention, $p=0.001$).

Mant et al (2002) in a controlled before and after study, developed a minimum dataset for medication information that would increase the receipt of necessary medication information to the general practitioner. The study found an increase in the proportion of discharge summaries faxed to the GP (2% pre-intervention vs. 32% post-intervention, $X^2=44.6$; $df=1$, $p<0.001$). 44/143 patients (31%) had information on the new discharge form relating to reasons for medication changes.

Paquette-Lamontagne et al (2001) conducted a controlled before and after study and redesigned the discharge medications section on the discharge summary to allow for the inclusion of information on changes, continuations or stoppages of medicines. The study found that the integration of all

medication information into a single form improved the content of the discharge summaries by increasing conformity in documentation (higher conformity rates on information regarding medications stopped and dosages changed in hospital in the post-intervention group (40% pre-intervention vs. 82% post-intervention, $p < 0.001$).

Sandler et al (1989) conducted a controlled before and after study, initiating a process to give discharged patients (N=275) a card with discharge information and an interim letter to pass on to their general practitioner to precede the discharge summary that would be sent directly from the hospital. The study found an improvement in the quality of the discharge summary; as the card was considered to have sufficient content and relevance (182/275 cards, 85%). The diagnosis was missing from only 11 cards. Doses of medications were recorded on 242 cards (96%), instructions for medications were present on 239 cards (95%) and the reason for the prescription was present on 240 cards (95%). The study did not provide details of the pre-intervention figures.

In a controlled before and after study, Vira et al (2006) incorporated the role of a pharmacist into the discharge documentation process, to improve content by reducing the discrepancies in the information communicated on medications with the actual medications given to the patient. The intervention prevented 20 clinically important discrepancies (60% of patients N=60, mean number of discrepancies per patient 2.3). This study did not provide data on the pre-intervention group.

Rao et al (2005) conducted a before and after study to assess the introduction of a standardised template accompanied with a scoring system aimed at

improving the quality of the content of the discharge summary. The purpose was to eliminate irrelevant details, increase clarity and the consistency with the diagnosis. The intervention resulted in an increase in the quality score post-intervention by 21% (28 pre-intervention vs. 34 post-intervention, $p < 0.001$) and a decrease in dictation length and shorter discharge summaries that contained more relevant content (81 lines pre-intervention to 35 lines post-intervention- a 67% decrease in length, $p < 0.001$).

3.4.4.2. Timeliness

Eleven studies sought to assess potential improvements in the timeliness of the hospital discharge documentation. These studies included randomised controlled trials (N=4: Balaban et al, 2007; Preen et al, 2005; Sands and Safran, 1994; Van Walraven et al, 1999), time series analyses (N=2: Curran et al, 1992; De Clifford et al, 2009), controlled before and after studies (N=1: Branger et al, 1992), and before and after studies (N=4: O'Leary et al, 2009; Olsen and Adamek, 1995; Smith and Holzman, 1989; and Wood et al, 2009).

The intervention studies used various methods to attempt to improve the timeliness of the discharge summary document, including replacing or enhancing previous discharge processes (O'Leary et al, 2009; Preen et al, 2005; Wood and Campbell, 2009), or increasing the involvement of the patient (Curran et al, 1992) or pharmacy (De Clifford et al, 2009). The studies attempted to improve on the timeliness of communication between secondary and primary care with the introduction of electronic methods (Balaban et al, 2007; Branger et al, 1992, Sands and Safran, 1994; Olsen and Adamek, 1995; Smith and Holzman, 1989).

Computerisation in the Interventions

Eight studies evaluated the introduction of an automated or computerised database or patient record system to assist in the generation of an electronic discharge summary to improve timeliness (Balaban et al, 2007; Branger et al, 1992; De Clifford et al, 2009; O'Leary et al, 2009; Olsen and Adamek, 1995; Sands and Safran, 1994; and Smith and Holzman, 1989; and Van Walraven et al, 1999).

The randomised controlled trial conducted by Balaban et al (2007) included the use of an electronic discharge form combined with telephone outreach to the GP, with the aim of improving the rate of receipt by the GP for the purposes of follow up. A significant difference was found in the rate of failure to follow-up with the general practitioner within 21 days of discharge (40.8% of patients had no follow-up pre-intervention vs. 14.9% post-intervention, $p=0.01$).

In a randomised controlled trial, Van Walraven et al (1999) elected to introduce a system of database generation of discharge summaries to replace voice dictation, and found a significant improvement in the likelihood that summaries would be generated within one month of discharge (57% pre-intervention vs. 79.6% post intervention $p<0.001$).

Sands and Safran (1994) conducted a randomised controlled trial and introduced a computer programme to enhance the speed of the discharge process by providing guidance to physicians when completing the discharge summary and providing immediate electronic notification to primary care when a change was made to patient's medications. Hospital staff using the programme found it quicker to make decisions on medications using the

guidance of the computer programme. The study found the time taken to complete discharge information was lower post-intervention (12 vs. 6 minutes $p=0.048$).

De Clifford et al (2009) also conducted a time series analysis in which the intervention was based on an electronic script transcription service initiated by a pharmacist upon patient discharge from hospital, aimed at reducing the length of time taken to discharge the patient. The intervention resulted in a reduction of the time taken between decision and actual discharge by 34% (5.5 hours pre-intervention to 3.4 hours post-intervention, $p=0.02$). There was also a reduction in the time taken by the pharmacy in clarifying or amending prescriptions for medication (9.5 minutes pre-intervention, 1.5 minutes post-intervention, no p -value was given). The intervention also improved on the time taken by doctors to complete discharge medications information (15 minutes pre-intervention to 2 minutes post-intervention, no p -value was given).

In a controlled before and after study, Branger et al (1992) used electronic data communication to replace traditional paper-based forms, with a view to reduce the time interval from generation to delivery. The study found that with the introduction of electronic data communication, the time intervals appeared to decrease for the GP to receive the discharge document. Pre-intervention the median was 2 days, and at the post-intervention stage almost all summaries were received by the GP within 1 hour of generation and on the same day of discharge (1269/1388 summaries). 78/1388 summaries were received within 2 hours, 20/1388 were received within 3 hours, and 21/1388 were received over 3 hours after discharge. There was no statistical evaluation of these figures given.

O'Leary et al (2009) conducted a before and after study introducing an electronic discharge system to take over from the previous manual processes of dictation. The study found a significant improvement in the proportion of summaries sent out within three days of discharge (44.8% pre-intervention vs. 74.8% post-intervention, $p < 0.001$).

Olsen and Adamek (1995) conducted a before and after study incorporating a system for electronic transmission of discharge summaries to lessen the time needed upon receipt to complete patient evaluations and follow-up. The study found that pre-intervention evaluations at the receiving end took 3.8 hours (std. dev. 5.92 range 0-24.5 hours) and post-intervention evaluations took 3.2 hours (std. dev. 1.2 range 1.5-6 hours), but this difference was not statistically significant ($t = 0.39$, $p = \text{n.s.}$).

Smith and Holzman (1989) conducted a before and after study and introduced technology in the form of a computer data sheet into the process of generating narrative discharge summaries, and found a significant reduction in the number of delayed documents, as well as the effort required to perform the task, with the mean turnaround time reduced from twenty days to four ($p = 0.001$).

Non-Computerised Interventions

Three intervention studies used methods that did not incorporate elements of technology or computerisation yet attempted to improve on the timeliness of discharge communication (Curran et al, 1992; Preen et al, 2005; Wood and Campbell, 2009).

The randomised controlled trial conducted by Preen et al (2005) consisted of the development of a discharge care plan pre-discharge that was then sent to primary care, improving speed of communication between the hospital and primary care. The time between discharge and communication with the GP was reduced post-intervention ($p=0.002$) as all the general practitioners in the study were notified by fax pre-discharge in the intervention group (vs. 4.4 days in the control group).

Curran et al (1992) undertook a time series analysis to evaluate an attempt to improve on timeliness in the rates of receipt of the discharge document by GPs. The study compared the speed of hand-delivery by the patient versus the addition of postal delivery and found that the mean delivery time for the pre-intervention group was 4.90 days (range 1-23 days) vs. 2.96 days (range 1-10 days) in the post-intervention group. This was an improvement of 40.8%, however no statistical analysis of these figures was given in the study.

Wood and Campbell (2009) conducted a controlled before and after study developing a standardised outcome assessment strategy for discharge, to reduce the time between the patient's discharge and the generation of the summary, and the time between discharge and follow-up with the primary care provider. The study incorporated three cycles of assessment and found that there was an increase in the proportion of summaries faxed within 48 hours of discharge (cycle 2, 0% pre-intervention, 82% post-intervention) however this proportion decreased in cycle 3 to 65% (no statistical evaluation was provided for this part of the study).

3.4.5. Secondary Outcomes Assessed

Several studies assessed secondary outcomes alongside the primary outcomes of completeness and timeliness. Among the secondary outcomes assessed were readmission rates, visits to emergency departments and ease of use (including workload). There were three randomised controlled trials (Balaban et al 2007; Coleman et al, 2006; Sands and Safran, 1994), and one controlled before and after study (Dedhia et al, 2009).

The randomised controlled trial by Balaban et al (2007) introduced an electronic discharge form combined with telephone outreach to the GP to reduce readmission rates and emergency department visits within 31 days. The study found that 55% of patients in the pre-intervention group had one or more undesirable outcomes for patients (readmission, emergency department visit, failure of GP to complete work-up or no follow-up with GP, emergency department visit) compared to 25.5.% post-intervention, $p=0.0008$.

Coleman's "Care Transitions Intervention" a randomised controlled trial, involved the use of a patient-centred record that was maintained and owned by the patient to improve the rates of follow-up and reduce re-hospitalisation. The key intervention outcome was the rate of non-elective readmission to hospital for the same condition (Coleman et al, 2006). The study found that re-hospitalisation rates were higher pre-intervention (at 30 days: pre-intervention 11.9 readmissions vs. 8.3 readmissions post-intervention, $p=0.048$) at 90 days the pre-intervention group still had high re-hospitalisation rates: (22.5 readmissions vs. 16.7 post-intervention, $p=0.04$) and at 180 days the pre-intervention group rates of readmission were also higher (13.9 vs. 8.6 post-intervention, $p=0.046$).

Dedhia et al (2009) used a "Fast Fax Form" to notify the GP of admission as part of more comprehensive discharge planning processes, the study monitored 30-day readmission or return to the emergency department measured using Coleman's Care Transition Measures. The study by Dedhia et al (2009) found return to the emergency department within 3 days of discharge was lower post-intervention (10% pre-intervention vs. 3% post-intervention, OR=0.25, 95% CI 0.10-0.62) and at 30 days there was also a lower readmission post-intervention (14%) vs. 22% pre-intervention OR=0.59, 95% CI 0.34-0.97).

Sands and Safran (1994) conducted a randomised controlled trial and introduced a computer programme to providing guidance to physicians when completing the discharge summary. The study found 61% of house officers had used the programme and 68% of those users reported that it made deciding on medications easier, and simplified clerical work. There were no sample sizes for hospital staff surveyed given in the study report.

3.4.6. Meta-Analysis Potential

Consideration was given to potentially conducting a meta-analysis by narrowing the focus of the systematic review to cover only those interventions which made an attempt to modify existing practices of creating discharge summaries with the introduction of standardisation or electronification (computerisation). The study of methodological quality informed this decision (see 3.4.3). There were elements of clinical as well as methodological diversity. There were differences in the participants, intervention methods and outcomes, thus the treatment effect and the particular element of interest within the outcome was different in the different studies. The configuration of the results in each of the studies also varied tremendously, with some opting to use Likert rating scales for physician preferences (O'Leary et al, 2009). Still

another used average time spent (hours) (Olsen and Adamek, 1995) and the percentage of summaries completed within a specific time frame (Van Walraven et al, 1999). Eden et al (2008) measured the number of activities/shift and the percentage of missing information on the document.

After rigorously considering the potential for meta-analysis for this review, it was concluded that it was not supportable to conduct a meta-analysis -even when narrowing the focus- due to the heterogeneity and variety of outcomes between the types of interventions aiming to improve discharge information communication.

3.4.7. Previous Systematic Reviews

The single systematic review of literature retrieved from the electronic search was by Kripalani et al (2007). This review addressed the issue of deficits in communication and information transfer at the point of hospital discharge, and assessed various interventions that aimed to improve on these deficits. Relevant studies from this review have been included in this current systematic review and described in 3.4.4.

Kripalani et al (2007) conducted a search of the Cochrane Database of Systematic Reviews and Medline, as well as performing a hand-search of the retrieved article bibliographies. Kripalani et al (2007) included all intervention studies that targeted information transfer and all controlled studies evaluating the efficacy of information transfer improvement interventions through 2006. The systematic review focused on the elements of timeliness, availability, format and content of discharge communication. The study was also interested in physician satisfaction with this communication, and this is a point where the systematic review presented in this thesis diverged.

A thorough examination of the systematic review by Kripalani et al (2007) was undertaken to compare similarities in search methods (search terms, strategy) as well as the findings. The researcher (HZ) assessed if there were studies located that the current results did not locate, and mark interventional studies that had been conducted since the Kripalani review was published (2007), as well as attempting to pinpoint any reasons for such differences in findings. Although at the outset it appeared that the two reviews were matching, further perusal enabled the researcher to identify where the studies diverged and provided explanations for the inclusion by Kripalani of some studies and the exclusion of others that were retrieved by this systematic review.

The search terms used by Kripalani et al (2007) in Medline were grouped into 3 categories: (1) hospitals, hospitalists, ambulatory care facilities, physician's offices, outpatient clinics, ambulatory care, primary care, family practice, family physicians, or physicians, (2) patient discharge, continuity of patient care, patient transfer, or discharge, (3) discharge summary, discharge letter, discharge communication, telecommunications, electronic mail, tele-facsimile, telephone, medical records, medical record linkage, computerized medical records systems, hospital records, inter-professional relations, or communication. Although the search terms used by Kripalani et al (2007) were more specific, there was an additional category of "Outcome" used by this current systematic review.

The Kripalani et al (2007) review utilized only Medline and Cochrane as electronic databases, whereas the researcher (HZ) conducted a systematic search of four electronic databases: Medline, EMBASE, CINAHL and HMIC.

Kripalani et al (2007) had included nine studies that the current systematic review did not locate, and these were added to the list of articles to be assessed for inclusion: Archbold (1998), Coleman (2006), Essex (1991), Flyer (1988), Lissauer (1991), Mant (2002), Sands (1994), and Smith (1989). The reasoning behind why the search terms for this current review did not locate these studies was deemed to be due to the more sensitive search terms used by Kripalani et al (2007), as well as the experience of the team used by Kripalani et al (2007) to conduct the search electronically, and also possibly due to their knowledge of interventional research conducted by colleagues.

Nevertheless, the systematic review presented in this thesis located nine studies that were published pre-2007 but had not been included by Kripalani in their systematic review (Abrahamian et al, 2002; Carey et al, 1999; Cortes et al, 2004; Couper and Henbest, 1996; Essex et al, 1991; Herbermann, 2000), Nace et al, 2006; Olsen and Adamek, 1995; and Vira et al, 2006). This could have been due to a divergence of aims of the two studies: this current study aimed - in addition to assessing the efficacy of the interventions - to locate interventions specifically incorporating elements of switching from traditional methods of discharge communication to those more technologically advanced. This could also have been due to the fact that this systematic review searched a larger number of databases.

In addition, the results of the current systematic review included five studies that were not included in Kripalani et al (2007) due to their later publication dates: Bergkvist et al (2009), De Clifford et al (2009), Dedhia et al (2009), O'Leary et al (2009) and Wood and Campbell (2009).

3.5. Discussion

3.5.1. Main Findings

The stated objectives of the systematic review were to ascertain the effectiveness of the included interventions in improving the quality (timeliness and completeness) of discharge communication and specifically assess the studies that examined switching from traditional methods of completing discharge summaries to methods that are technologically advanced for impact on quality.

The systematic review showed a mixed picture of the efforts to improve discharge communications. There were some interventions (9/21 studies) that succeeded in significantly improving discharge summary communication in terms of completeness (Eden et al, 2008; O'Leary et al, 2009; Olsen and Adamek, 1995; Couper and Henbest; 1996; De Clifford et al, 2009; Mant et al, 2002; Rao et al, 2005; and Paquette-Lamontagne et al, 2001, Van Walraven et al, 1999).

Three studies showed no significant effects with the interventions introduced with the aim of improving completeness (Crosswhite et al, 1997; Sandler et al, 1989; Vira et al, 2006), this could be due to the lack of statistical analysis or the lack of presentation of pre-intervention data in those studies. There were no studies which showed negative effects post-intervention on completeness of discharge communication; however this could be due to publication or reporting biases.

As for timeliness, several of the interventions (10/21) succeeded in significantly increasing the speed of the generation of the document as well as the transfer of the information (Balaban et al, 2007; Branger et al, 1992; Curran et al, 1992; De Clifford et al, 2009; O'Leary et al, 2009; Preen et al,

2005; Sands and Safran, 1994; Smith and Holzman, 1989, and Van Walraven et al, 1999; Wood and Campbell, 2009).

Only one study showed no significant effects with the intervention aiming to improve on the timeliness of discharge communication (Olsen and Adamek, 1995).

3.5.2. The Effectiveness of the Interventions

This systematic review brought together many studies that attempted to solve the discharge communication conundrum in a variety of interventional methods. Most of the studies included in the review were of a before and after design (N=8 controlled before and after, N=6 before and after, see 3.4.2) with researchers attempting to alter an existing process in a number of ways and observe changes to outcomes.

The intervention studies were similar in that they all attempted to tackle the acknowledged complex issue of discharge summary communication, and trying to unravel some of the difficulties in balancing the issues of speed and comprehensiveness. The interventions varied considerably, as each attempted to modify and improve a particular aspect (or more than one aspect) of the larger discharge information communication challenge.

Some studies cited particularly significant results in improving the completeness of discharge summaries. Eden et al (2008), Van Walraven et al (1999) and O'Leary et al (2009) introduced a computerised system into the discharge documentation and communication and proved the merits of the use of such systems to generate discharge documentation. Olsen and Adamek (1995) replaced telephone communication with the use of fax transmission of discharge documentation, and found a significant increase in the comprehensiveness and completeness of the communication. The

interventions by Couper and Henbest (1996) and Rao et al (2005) succeeded in showing significant improvement with the use of templates for discharge summaries. Mant et al (2002) showed significant improvements with the introduction of a minimum dataset. Paquette-Lamontagne et al (2001) showed significant results in combining medications into the discharge summary document.

The introduction of computerisation served to increase efficiency in the compilation of information into the discharge document, and assisted the staff in completing the summary. The use of the fax machine reduced the need for verbal communication, and the templates provided guidance to the doctors on information that should be included.

With regards to timeliness as affected by computerisation, significant findings were shown by Balaban et al (2007) when an electronic discharge was used in terms of the improvement in follow-up rates. Smith and Holzman (1989), Branger et al (1992), O'Leary et al (2009) and Van Walraven et al (1999) also demonstrated successful introduction of technology into the discharge process, citing a significant reduction in the delay of discharge summaries.

Interestingly, three interventions attempted to improve both outcomes (completeness and timeliness) simultaneously (De Clifford et al, 2009; O'Leary et al, 2009, Van Walraven et al, 1999). Though the results from De Clifford et al were not significant, the studies by O'Leary et al and Van Walraven et al returned significant improvement from the introduction computerisation into the discharge summary generation process (an electronic discharge system and an electronic database respectively) $p < 0.001$.

The standardisation and addition of elements of technology to the discharge processes used by the health care facilities studied in these interventions was performed with the view that updating and computerising communications would streamline care, increase efficiency, reduce staff workload and improve the ability of the healthcare services to cope with the increasing complexity of care and the ever-burgeoning patient load and communicate more effectively with the next point of care. Structuring discharge documentation and requiring its completion by specific health care professionals according to pre-set procedures and steps has seen beneficial impact on patient care, as prompting the health care professional or reminding them to perform the task at specific points in the patient journey through hospital.

3.5.3. Strengths and Limitations of the Findings

The studies selected for inclusion in the systematic review presented several strengths and weaknesses. The methodological quality of the studies has been examined earlier in this chapter (see 3.4.3.) A variety of study types were used to assess and improve the quality of discharge communication (randomised controlled trials, time series analyses, controlled before and after studies, and before and after studies).

A clear weakness of the findings was the failure of several studies to present pre-interventional figures (Sandler et al, 1989; Vira et al, 2006), and the lack of statistical analysis in several studies (Crosswhite et al, 1997; Olsen and Adamek, 1995; Curran et al, 1992; and Wood and Campbell, 2009). This had the potential to affect the assessment of the effectiveness of the interventions.

It must also be noted that the results of some of the studies may have been compromised by the Hawthorne effect; as having participants and health care staff un-blinded to the interventions and the attention given to introducing a change to working practice can have a marked impact on the success of a project.

The 21 included studies were performed in different countries within different types of health care systems. The research was conducted in a variety of settings (urban teaching hospitals, treatment centres, GP surgeries, acute care facilities, rural hospitals, and private medical centres), with different types of test sites (multi-site over three hospitals in the region, small surgical ward, medical unit, across one rural hospital). These elements almost certainly affect the generalisability of the findings of the studies. The measures of effectiveness must be viewed with these strengths and weaknesses in mind and the significance of the results should be considered in light of the methodological quality of the studies, the size of the samples studies as well as the dates of publication.

There must also be a consideration of inevitable publication bias that may have limited the availability of research in the public domain that had attempted to intervene and modify the discharge communication process but did not achieve sufficient findings to merit publication; such as studies with smaller sizes that may have been undertaken but remain unpublished (grey literature). This would not be the case with larger trials which would be more inclined to publish positive or negative findings due to the resources expended.

3.5.4. Strengths and Limitations of the Review

One of the main strengths of this review stemmed from the fact that the researcher (HZ) had previously conducted a systematic review of literature for the purposes of the master's degree thesis in 2006-2007 on prescribing safety in primary care (comparing the United Kingdom and Saudi Arabia), and this experience provided solid footing from which to embark on this current research project.

Drawing on previously gained knowledge of the methods to construct a search question, strategy, search terms and locate the appropriate resources as well as organise the thinking and data collection tools, the need for the advice of the medical librarian was identified early on in the construct of the search terms, strategies and the selection of the databases that would be relevant to the review.

During the course of the PhD degree programme, the researcher (HZ) had the flexibility of time to be able to spend poring over the lists of titles retrieved, the abstracts selected and the articles of literature themselves in greater detail and attention, due to the lack of constraints imposed by the structure of a master's degree programme. There was also the option to utilise the inter-library loan services of the libraries to access the articles that were unobtainable from the internet.

The researcher (HZ) was however limited in the ability to achieve the gold standard of systematic reviews which is attempting to meet the criteria of a Cochrane Systematic Review, and this was due to the fact that the work described in this chapter was the product of a single author (HZ) - not discounting the assistance obtained in screening titles and abstracts in Stage

2 from (SA) - whereas Cochrane Reviews typically employ a full team of dedicated professional researchers (see Chapter 2).

The number of databases that was feasible to search, retrieve data from and sift through was also constrained. A larger number of databases could have proved overwhelming and potentially unmanageable in terms of a PhD research project, which is comprised of not only the literature section but also of actual physical research, other types of data collection and analysis that command a great deal of attention as well.

A weakness of the systematic review was the necessity to eliminate literature that was retrieved as potentially relevant due to the language constraints. A team of multi-lingual researchers or access to the time and resources to translate such articles might have added diverse results to this review (see Fig.1. Search Strategy Diagram). As well, this review did not have within its scope any attempt at intervention that has gone unpublished, although the researcher (HZ) recognises that in a policy-related study, grey literature has value.

3.6. Chapter Summary

The intervention studies indicate that there is potential for minor changes to existing practices (such as handing a copy to the patient as they leave the hospital, or introducing electronic systems to generate discharge summaries) to impact on the quality (completeness and timeliness) of discharge communication.

Several intervention studies returned significant results in improving completeness and timeliness of discharge summaries; these were based on

the introduction of computer databases and electronic systems to facilitate discharge summary compilation, generation and transmission. From this, the following chapter will examine local implementation efforts of newer processing methods for discharge summaries and assess their impact on the quality for both completeness and timeliness.

Chapter 4- Discharge Summary Communication- Before and After Studies

In this chapter, the researcher (HZ) describes the three before and after studies within a case study of a single NHS Trust (NUH) attempting to improve discharge communication by introducing standardisation and electronic systems.

4.1. The Nottingham University Hospitals NHS Trust

The Nottingham University Hospitals NHS Trust is split over two large urban hospital campuses, Queen's Medical Centre and City Hospital. These facilities provide services to over 2.5 million people in Nottingham and the surrounding areas of the East Midlands region in England. The hospitals have a capacity of over 1700 beds and 100 wards and provide general medical and specialist services. The Trust's annual budget exceeds £700 million and it employs over 10,000 staff.

Coinciding with the conduct of the Connecting for Health Evaluation Project (CfHEP 005) and corresponding to the national interest in developing electronic patient record systems to manage patient data, during the time this research was being conducted, the Nottingham University Hospitals Trust had re-activated a team that consisted of hospital health care professionals, hospital management and information technology specialists to develop and implement a Trust-wide electronic discharge system. This was acknowledged as a stopgap measure while anticipating the NHS Care Records Service to be implemented at the Trust.

This electronic discharge scheme began by piloting a new discharge summary template on ward B3 (acute admissions) at the Queen's Medical Centre in 2009 and adding other departments over time, with the aim for the Trust to

be fully “electronic discharge” by mid-2010. This “new” discharge form was an electronic version of the previously used paper copy.

The first iteration of the electronic discharge system was launched in 2009 and consisted mainly of a discharge document that had basic details of the patient's admission, but did not include medications. The medications remained separate, handwritten on a green carbon paper form that was known as the "TTO" (To Take Out) sheet. The "TTO", or otherwise called "the green form" by health care professionals was a landscape carbon copy document in quadruplicate that was developed within the Trust for use by the hospital to record basic information on the patient stay (name, date of birth, GP name and address, main diagnosis and list of medications). There were two versions; one for the Queen's Medical Centre and another for the City Hospital Campus. This form, while straightforward to complete, has been acknowledged as problematic (see Chapter 5 - Health Care Professionals Perspectives).

The reasons for this trouble were multi-faceted; as the carbon paper was handwritten, being able to read the information on the last sheet was dependent on the person filling it out to press down hard enough with the pen for the writing (and information) to transfer all the way through. The spaces and boxes where information was to be written were not large enough to allow for much to be written, and there was no space allowed for additional comments. The TTO was often not completely filled in, and there were the common handwriting and illegibility issues.

The second iteration implemented in late 2010 had updated the electronic discharge summary to incorporate the "TTO" and add the medications to the discharge summary, based upon the insistence of the health care

professionals involved in piloting the first iteration (see Chapter 5- Health Care Professionals Perspectives).

The Electronic Discharge Team also drew heavily on the experiences of the Department of Paediatrics requesting input and advice on the development of the system, as Paediatrics had been using their own electronic discharge system with measured success, which they had constructed and had been using within the department over several years. The Electronic Discharge Team, when made aware of the studies the researcher (HZ) was conducting in the different departments at the Trust were interested and followed the progress of these studies, and then requested a presentation of the findings to them at a high-level project group meeting in February 2011.

4.2. Unstandardised Vs. Standardised Discharge Summaries

The study described in this section examined the efforts of one department (Health Care of Older People) to modernise and introduce changes; standardising its discharge summary preparation processes.

4.2.1 Objectives

This study was considered to be a pilot. The objectives of the pilot study were to:

- Assess the completeness of information in discharge summaries before and after a discharge summary template for standardisation was introduced according to the Gold Standard established by the Royal College of Physicians
- Develop and test the data collection tool, as well as assess inter-rater reliability for potential use in further research studies.

4.2.2. Methods

The study incorporated a pre and post comparison method, comparing two sets of discharge summaries prepared in two ways (dictated unstandardised vs. handwritten standardised), using the data collection tool developed based on the Royal College of Physicians Standards for the Structure and Content of Medical Records (see appendix B-2).

The hospital patient records database NotIS keeps accurate and updated information on patient stays in hospital, and this database was used to view the records selected for the purposes of the assessment. Using the hospital information system NotIS to access the sample of records, the discharge summary for the admission episode for each record was assessed against the standards for discharge summary completeness using the data collection tool.

Each record required approximately 8-10 minutes to be evaluated. Patient demographics were recorded, as well as the date of patient's admission, patient's discharge and thus the duration of inpatient stay.

4.2.2.1. Data Collection Tool

The Royal College of Physicians has published Standards for the Structure and Content of Medical Records. This has been proposed as the Gold Standard that is to be incorporated into use across the NHS for all patient documentation (admission, handover and discharge).

The Health Informatics Unit at the Royal College of Physicians of London issued a consultation questionnaire in 2008 to various types and grades of health care professionals. The goal of the consultation was to encourage the development and establishment of a consensus from experienced medical and health professionals for what should be on hospital documents as crucial as

those of admission, handover and discharge. The responses and feedback to this consultation were used to develop the standards for both the structure and the content of medical records, and the Royal College of Physicians issued these standards, with summary headings and definitions in April of 2008 (see appendix B-2). These were then formally approved by the Academy of Medical Royal Colleges (Royal College of Physicians 2008, a, b; 2012).

For the purposes of the research described in this chapter, the standards, summary headings and definitions issued for the area of discharge were used to develop a data collection tool that enabled the assessment of the completeness of information available on hospital discharge summaries (see appendix B-1). The data collection tool was developed over a period of six months (August 2008- January 2009). Officials from the Royal College of Physicians were consulted during the development, as well as local academic researchers within the University, hospital physicians and general practitioners.

The data collection tool took the form of a checklist, with two columns for items to be recorded as present or not present; the checklist contained 57 items under 7 headings (GP Information, Patient Information, Admission Information, Discharge Information, Clinical Information, Advice Recommendations and Future Plan, and Person Completing Summary). The final version of the data collection tool used in this study was approved by the PhD research supervisors and the consultant overseeing the study in the Health Care of Older People Department in March 2009 (see appendix B-1).

4.2.2.2. Clinical Setting: Health Care of Older People

The pilot study was undertaken within the Department of Health Care of Older People, which is based at the Queen's Medical Centre Campus. This department provides general medical services as well as specialist clinics and support services for Parkinson's disease, bone density, falls and stroke. Inpatient services are housed at the Queen's Medical Centre. The Department employs over 200 staff.

The Department of Health Care of Older People had recently introduced changes to the collation of information for the discharge summary, which was believed to have improved the rate of completeness of information within the summaries. Where previously they had been using an *ad hoc* method of dictation by doctors that did not follow any particular order, they had recently introduced a structured handwritten template that had several sections requiring information on the patients' details; diagnosis, investigations and procedures, medications and follow-up care instructions. The Department was interested to conduct a study to compare samples of discharge summaries from before and after the introduction of the template.

The researcher (HZ) first met with a senior consultant in this department in Autumn 2008 in order to learn of changes that had been introduced to the way this department was preparing discharge summaries.

Where the older method was of unstandardised dictation was transcribed and then typed by the secretaries on un-headed paper and sent out, the newly introduced handwritten standardised summaries were typed by the secretaries on headed paper that contained details of the Trust, the NHS logo, the Hospital and Department names, with contact information clearly displayed. The Department was aware that as the previous *ad hoc* discharge

summary had been lacking in certain important features of standardisation and completeness, they were interested to measure the benefits of introducing a structured template.

The researcher (HZ) met with a Senior House Officer within the Department in December 2008 to find out how the department discharge summary process typically worked, and how to best approach collecting data comparing the two types of summaries (unstandardised vs. standardised).

The Senior House Officer in turn recommended four junior doctors who were on rotation to the department at the time. These four junior doctors then participated in the data collection for purposes of establishing inter-rater reliability for the data collection tool. For the purpose of assessing inter-rater reliability, four junior doctors participated in the data collection. These junior doctors had been on rotation on the ward being studied within the previous year.

A session was held with these junior doctors to discuss at length how they learned to "do" discharge summaries, how they felt about the task, what they thought was the best way to generate them (see also Chapter 5 - Health Care Professionals Perspectives). The session also provided orientation before commencing the study; introducing the concept to the junior doctors, and encouraging them to familiarize with the data collection tool and accompanying document on the Royal College of Physicians Discharge Summary Headings and Definitions. The junior doctors were given a sample of the data collection tool and the supporting materials (see appendix B-1, B-2).

Schedules were arranged to conduct the data collection in advance. The researcher (HZ) created two data collection booklets, each consisting of an executive summary of the study, the schedule for data collection, 100 data collection forms, the Royal College of Physicians Document on Discharge Summary Headings and Definitions (for reference during data collection), and the patient record lists.

The researcher (HZ-R1) and the four junior doctors (R2, R3, R4, R5), assessed the discharge summaries against the audit standard using the data collection tool. At each scheduled data collection time, the researcher (HZ) and one of the data collectors (in turn) would occupy two adjacent computer terminals at the location, and select a patient record to access, obtain the discharge summary, read it and record the presence or absence of the item on the data collection tool. At that point the junior doctors freely expressed their views on what they saw during the data collection stage and how they approached writing discharge summaries themselves.

The results of the Study were reported to the Department Consultant in Autumn 2009 and an interview was conducted to obtain perspectives on the findings and on the future outlook for discharge communication processes within the Department. A further interview was conducted in February of 2011 with another consultant linked to a member of the electronic discharge team.

4.2.2.3. Sample

The sample of discharge summaries evaluated in this study was selected for in-patients from the ward discharge book of the study ward. A systematic convenience sampling method was used, selecting every 4th surname on the list in the ward discharge book for the period of interest. One hundred patient

records were selected from the discharge book on the ward by two of the junior doctor data collectors assigned by the ward consultant overseeing the study.

Fifty percent of the sample was records for patients who had an admission in the months of August to November 2007, and were of the dictated unstandardised format. The other 50% of the sample were records for patients who had an admission in the months of September to November 2008, and were of the newly adapted format, which were compiled using a standardised template. All discharge summaries selected were obtained from the hospital administration and patient information system NotIS, which stores the data electronically.

4.2.2.4. Analysis

Data Management and Statistical Testing

The data from the booklets were entered into a Microsoft Excel 2007 workbook. Patient identifiers (hospital record number, patient names were anonymised and each was assigned a code (p1-p50 for the unstandardised set, and p51-p100 for the standardised set). The evaluation of the unstandardised set was separated from the standardised set. Each record was assessed for the number of items present and not present according to the RCP standards, and a percentage of completeness calculated. An average of the percentages of completion was calculated for each set, and the highest and lowest percentages noted.

The data were then imported into a Microsoft Access 2007 database; two tables were created (one for the main researcher's (HZ) evaluations of the samples and one for those of the data collectors). This was performed to allow an assessment of inter-rater reliability, to enable the validation of the data

collection process, and to allow for the addition of further cases if needed in further research (as this was a pilot study).

The Microsoft Access 2007 database was then imported into Statistical Software Package (SPSS) v.16, where summary statistics, and statistical significance, and other calculations were performed and charted. Variables were created for (Year of Admission), (Patient Record Number), (Data Item), (Section of Discharge Summary). Descriptive statistics were used to calculate frequencies.

To assess the sample, patient ages at the time of discharge were calculated using the patient date of birth and the discharge dates, and an average patient age was calculated for each dataset. The average length of inpatient stay was calculated for each set using the dates of admission and discharge recorded.

As the data on discharge summary content were categorical (present or not present), the Chi Square test was conducted to assess differences in completion of specific items on the checklist between the two types of summaries.

The Independent samples T-Test was used to assess the continuous data on discharge summary completeness, in terms of whether the changeover from the pre-comparison format to the post-comparison format discharge summaries had any impact on the completeness and/or timeliness of information of the summary.

Visual Representation of the Study Findings

The data collected were incorporated into a Microsoft Excel 2007 file in a manner visually representing the findings of the study (see appendix B-3-ii). Developing this method of displaying the results has proven its value in quickly providing a clear picture of the study findings. This has been used in various presentations to health care professionals and has generated a great deal of interest, discussion, and positive feedback.

Two tables (one for each discharge summary type) were created, with rows depicting the items on the data collection tool, and columns referring to each record within the set. Items that were present were marked with a green box, and items not present were marked with a red box.

By assessing the tables vertically, the results show how complete (or incomplete) each record was, and by assessing the table horizontally, the results show the completeness of each item across the sample year. The tables may also be used to assess the completeness of each section of the checklist (GP details, patient details, etc.) to gauge differences between the types of discharge summaries. The grey boxes show records in the sample that did not have a discharge summary on file and were therefore not evaluated.

4.2.2.5. Inter-Rater Reliability

Inter-rater reliability was assessed to establish the viability of the data collection tool for wider use in healthcare audits in the future (if two different people use the tool, how likely is it they will get the same answer?).

Two datasets were created for this purpose: a) with the main researcher's (HZ) data alone, b) with both the data from the main researcher and the four

other data collectors. The creation of two tables in SPSS (the first for the main researchers' findings and evaluation of the sample (Researcher 1 (HZ)) and the second table for the findings of the additional researchers (Researchers 2, 3, 4, 5), was done to allow distinction between the findings. The second table was further split up to allow for the independent comparison of each of the four additional researchers to the main researcher.

Thirteen items were selected for inter-rater reliability testing from the 57 on the data collection tool; these were items which posed the greatest difficulty in reaching a consensus during the data collection phase for the researchers: GP Practice Code, Gender, NHS Number, Patient Address, Method of Admission, Hospital Site, Discharge Method, Mental Capacity, Medication Changes, Hospital Action, GP Suggested Strategies, Info given to Patient, Date Record Completed.

Kappa statistics were calculated for the 13 items in each table to assess the inter-rater reliability between the main researcher and each of the junior doctors for the sample (see appendix B-3-i). The Cohen's Kappa Coefficient was chosen as the items in question were qualitative and categorical. The Kappa statistic was considered more robust than simple percent agreement calculations as it takes into consideration the possibility that the agreement had occurred by chance. In this measurement, complete agreement by the researchers would be $k=1$ and no agreement (other than chance) would be $k \leq 0$.

4.2.3. Results from Health Care of Older People

Sample Demographics

The sample selected for the data collection was 50 patients in the unstandardised set and 50 patients in the standardised set. After assessing within NotIS, several records were discarded from the sample as they did not contain a discharge document on file. Therefore the final unstandardised set consisted of 35 records, and the final standardised set was 38 records.

The samples for the patients about whom the discharge summaries were written were similar in terms of the age (median 73 years unstandardised summaries, median 78 years standardised summaries), sex (proportion male 28.5% unstandardised summaries, proportion male 31.5% standardised summaries) and length of hospital stay (median 12 days unstandardised summaries, median 19 days standardised summaries).

The Discharge Summaries

From the data collected the unstandardised set of summaries had more unavailable records (15 unavailable in unstandardised summaries set, 11 unavailable in the standardised summaries set).

The mean percentage of completeness for the unstandardised set was 41.4% (std. dev. 6.14). In this set, the discharge summary with the highest percentage completeness scored 54.3%. The discharge summary with the lowest percentage completeness scored 26.3%.

The mean percentage of completeness in the standardised set was 43.8% (std. dev. 7.14). In this set, the discharge summary with the highest percentage completeness scored 61.4%. The discharge summary with the lowest percentage completeness scored 29.8%.

The observed difference between the two types of discharge summaries was 2.4% (41.4% unstandardised mean, 43.8% standardised mean, with the 95% CI for the difference: 5.5025, 0.7025; $p=0.12$). This indicates that there was no significant difference between the overall completeness of the two samples.

There was a slight difference between the two types of discharge summaries when listing medication: there was an increase in the proportions of summaries where medication changes were noted in the standardised sample 23/38 (60.5%) vs. unstandardised 18/35 (51%) (see Table 1).

Table 1. Health Care of Older People Discharge Summary Completeness Scores

Data Item <i>N=57</i>	Unstandardised		Standardised	
	<i>N=35</i>		<i>N=38</i>	
GP Details	Present	Not Present	Present	Not Present
GP Name	35	0	38	0
GP Address	35	0	38	0
GP Practice Code	0	35	0	38
Patient Details				
Patient Surname, Forename	35	0	38	0
Name Known As	0	35	0	38
Date of Birth	35	0	38	0
Gender	1	34	0	38
NHS Number	2	33	38	0
Patient Address	35	0	38	0
Patient Telephone	0	35	0	38
Admission Details				
Method of Admission	14	21	7	31
Source of Admission	17	18	11	27
Hospital Site	5	30	38	0
Responsible Trust	1	34	38	0
Date of Admission	35	0	37	1
Time of Admission	1	34	0	38
Discharge Details				
Date of Discharge	35	0	37	1
Time of Discharge	0	35	0	38
Discharge Method	20	15	12	26
Type of Destination	21	14	27	11
Destination Address	15	20	23	15
Living Alone	15	20	27	11
Discharging Consultant	35	0	37	1
Discharging Specialty/ Department	17	18	32	6
Clinical Information				
Diagnosis at Discharge	32	3	35	3
Operations and Procedures	6	29	4	34
Reasons for Admission and Presenting Complaints	35	0	36	2
Mental Capacity	5	30	3	35
Data Item <i>N=57</i>	Unstandardised		Standardised	
	<i>N=35</i>		<i>N=38</i>	
Advance Decisions to Refuse Treatment and Resuscitation Status	1	34	0	38
Allergies	0	35	0	38
Risks and Warnings	0	35	0	38
Clinical Narrative	31	4	14	24
Relevant Investigations and Results	28	7	13	25
Relevant Treatments and Changes Made to	31	4	21	17

Treatments				
Measures of Physical Ability and Cognitive Function	4	31	15	23
Medication Changes	18	17	23	15
Discharge Medications	34	1	35	3
Medication Recommendations	32	3	11	27
Advice Recommendations and Future Plan				
Hospital Action	7	28	5	33
Person Responsible for Hospital Action	7	28	4	34
Appropriate Date and Time for Hospital Action	2	33	0	38
GP Action	9	26	10	28
Person Responsible for GP Action	9	26	10	28
Appropriate Date and Time for GP Action	2	33	3	35
Suggested Strategies for GP Action	9	26	8	30
Community and Specialist Services Action	7	28	14	24
Person Responsible for Community and Specialist Services Action	5	30	7	31
Appropriate Date and Time for Community and Specialist Services Action	0	35	0	38
Data Item N=57	Unstandardised		Standardised	
	N=35		N=38	
Information Given to Patient or Authorized Representative	5	30	1	37
Patient's Concerns, Expectations and Wishes	3	32	1	37
Results Awaited	3	32	1	37
Person Completing Summary				
Doctor's Name	35	0	38	0
Doctor's Grade	35	0	37	1
Doctor's Specialty	6	29	3	35
Date Discharge Record Completed	35	0	38	0
Doctor's Signature	0	35	1	37
Distribution List	3	32	1	37

Inter-Rater Reliability

Between R1 and R2 there was a considerable variation in agreement; complete agreement on only 4 items, no agreement on 4 items, and less than adequate agreement on 5 items, which means that the inter-rater reliability between the two researchers was less than what could be expected by chance alone (see Table 2).

Between R1 and each of R3, R4 and R5 there was complete agreement on all items assessed for inter-rater reliability (see appendix for detailed Kappa scoring tables B-3-i).

Table 2. Kappa Scores for Inter-Rater Reliability

Item	Raters			
	R1/R2	R1/R3	R1/R4	R1/R5
GP Practice Code	K=1 complete	K=1	K=1	K=1
Gender	K=0 poor	K=1	K=1	K=1
NHS Number	K=0.61 moderate	K=1	K=1	K=1
Patient Address	K=0 poor	K=1	K=1	K=1
Method of Admission	K=1 complete	K=1	K=1	K=1
Hospital Site	K=0.23 fair	K=1	K=1	K=1
Discharge Method	K=-0.083 worse than chance	K=1	K=1	K=1
Mental Capacity	K=0.83 good	K=1	K=1	K=1
Medication Changes	K=0.11 poor	K=1	K=1	K=1
Hospital Action	K=0.82 good	K=1	K=1	K=1
GP Suggested Strategies	K=1 complete	K=1	K=1	K=1
Information Given to Patient	K=1 complete	K=1	K=1	K=1
Date Record Completed	K=0 poor	K=1	K=1	K=1
	Incomplete Agreement	Complete Agreement		

Feedback from the Junior Doctors

The junior doctors who participated in the HCOP pilot study were fulfilling a medical training requirement to conduct one audit per year. When data collection commenced each took considerable amount of time the first attempt to adjust to the idea of assessing a discharge summary and searching for particular pieces of information according to a checklist. By the end of the first hour, they had found the appropriate rhythm and were moving at pace through the list of records in the sample.

The junior doctors stated in various ways that it was interesting to view the discharge summary in a different light; to evaluate the content of what they usually saw as a mundane task, and to think about where the document was intended to go and who it was meant to be read and used by. Although it had been agreed that there would be very limited discussion of the sample during the evaluation, the Junior Doctors often had questions and required guidance to complete the checklist.

The Junior Doctors were intrigued during the data collection; as they progressed through the sample of records they would notice that a particular record had been compiled or prepared by a colleague, one of the others (R2, R3, R4, and R5) or the attending physician or consultant on the ward. That would generate comment; either the document was poorly prepared and contained very little information, or that it was very detailed and quite a lot of information could be gathered from the contents (see Chapter 5- Health Care Professionals Perspectives). They would judge the person by the quality of the content on the discharge summary. This made them take notice of what it meant to have a generally complete discharge summary and they said this had made them more aware of the importance of the task, and made them

think that they themselves were likely to be evaluated as well. This is important as it indicates that regardless of the type of summary, in order to produce optimal information, there is a need to increase awareness of the relevance of the task in the health care professionals supplying information.

4.3. Handwritten Vs. Electronic Discharge Summaries

The two studies described in this section examined the efforts of two departments (Nephrology and Paediatrics) to modernise and introduce changes; introducing electronic discharge summary preparation processes.

4.3.1. Objectives

The objectives were to:

- Determine whether the introduction of a new discharge documentation process increased the likelihood that discharge summaries would be done for each patient.
- Determine whether the introduction of a new discharge documentation process increased the likelihood that discharge summaries would be done sooner for patients.

- Determine whether the introduction of a new discharge documentation process increased the likelihood of discharge summaries to contain information as required by the Royal College of Physicians.

4.3.2. Methods

As in the pilot study, permissions and access to the samples of patient records for the pre-post comparisons were granted by the relevant authorities within the NUH NHS Trust. Using the hospital information system NotIS to access the sample of records, the discharge summary for the admission episode for each record was assessed against the standards for discharge summary completeness using the data collection tool.

The methods used in the pilot study were modified for these two studies comparing handwritten and electronic discharge summaries for completeness difference and additionally the timeliness of summary creation/transmission. A sample size and power calculation exercise was undertaken. The data collection tool previously developed (see appendix B-1) was used, with minor modifications made to the study design from that of the pilot in the Department for the Health Care for Older People, and a pre-post comparison of two types of discharge summaries (Handwritten vs. Electronic) was conducted in the two departments over a period of six months (January-July 2010).

Two semi-structured interviews and non-participant observations were conducted with health care professionals in each department in the preceding weeks. The researcher (HZ) spent time talking to consultants and junior staff, receptionists and records managers to develop an understanding of discharge processes used in practice, and of the factors that affect the completion of

discharge summaries as part of the routine of discharging patients after their stay in hospital (see Chapter 5 - Health Care Professionals Perspectives).

Patient demographics (age at time of discharge, gender) were recorded, as well as the date of patient's admission, patient's discharge and thus the duration of inpatient stay. The date of completion of the discharge summary, the person completing the summary, and the date the summary was sent to primary care were also recorded. Each record required approximately 5-7 minutes to be assessed. The data were collected using a booklet developed by the researcher (HZ), with a double sided sheet for the data collection tool for each summary evaluated.

4.3.2.1. Clinical Settings: Nephrology and Paediatrics

The Nephrology Department

This second study in the series of pre and post comparisons was undertaken at the Renal and Transplant Unit, which is based at the City Hospital Campus. The unit provides kidney disease services, such as acute renal failure, dialysis and transplant treatment. The unit has over 200 staff.

The researcher (HZ) was connected to a consultant in this department through the electronic discharge team at the Trust. The consultant was actively interested in the introduction of electronic discharge summaries within her department (see appendix B-4-ii), and had volunteered to test the new system before it was rolled out across the Trust. This department had previously been using handwritten summaries, created using a template (see appendix B-4-i).

The initial interview with this consultant took place in December 2009, in order to speak with her and gain access to discharge summary samples for the pre and post comparison studies being conducted concurrently. She then referred to a Senior House Officer and a Secretary, who walked through the wards with the researcher (HZ) and explained the discharge summary generation process as they saw it.

The process of sending out traditional handwritten summaries was straightforward; data on the patient's stay in hospital was collated by the junior doctor on call at the time onto a single sheet, signed off by the attending physician and sent to the GP by the secretarial staff.

The process of sending out electronic discharge summaries involved a higher degree of bureaucracy, as the individual health care professional must be registered with the appropriate access permissions and logged in as on duty, which poses problems during night shifts due to the lack of clerical staff and that patients are not on the system at night and that prohibits that staff member from creating the discharge summary. To create the electronic summary, the junior doctor would take the patient notes, find a terminal, log in and create a new document under the patient's electronic health record, populate it, and file it for electronic signature. After being reviewed and signed, the department secretary would print it out as a letter and post it to the GP.

Though the consultant had also referred several junior doctors and other senior house officers and made sincere efforts to facilitate meetings and interviews, there was no uptake from those individuals during the first wave. A further interview was conducted (the second wave- see Chapter 5) with

another consultant in February 2011, and a large group meeting was held within the department to report the study findings and gather general information and views on the discharge summary processes used in the department.

The Paediatrics Department

This third study in the series of pre and post comparisons was undertaken within the Paediatrics Department (Nottingham Children's Hospital), which is based at the Queen's Medical Centre Campus. Services include cardiology, endocrinology, chest disease, haematology, oncology, gastroenterology, and neurology. There is also a surgical unit attached and a Paediatric intensive care unit. The department has over 500 staff.

The NUH Electronic Discharge Team Members had recommended a senior consultant in this department; a person with many years of experience using electronic discharge summaries in several hospitals around the world. An initial interview was held with this consultant in December 2009 to gain insight into the discharge summary processes used in the department at the time as well as what had been used previously, and to obtain her perspective on the effectiveness of electronic methods for generating discharge summaries and communication. Access to a sample of discharge summaries for the purposes of the before and after comparison studies was also requested at the time of the initial interview.

The Paediatrics department had been using handwritten discharge summaries and then moved to using electronic summaries (see appendix B-5-i, B-5-ii), however had developed and implemented their own template prior to the introduction of the Trust-wide electronic discharge system initiative. This department was therefore considered a pioneer in electronic discharge

summary use, and the electronic discharge team heavily utilized its experience in the development and design of the implementation for the electronic discharge summary system.

The process of sending out handwritten summaries was straightforward, used in wards where there is a high rate of patient turnover (24 hours) where data on the patient's stay in hospital was collated by the junior doctor on call at the time onto a single two-sided sheet, signed off by the attending physician and faxed to the GP by the reception staff from a machine on the ward.

The process of sending out electronic discharge summaries involved a higher degree of bureaucracy, as the individual health care professional had to be registered with the appropriate access permissions and logged in as on duty, which poses problems during night shifts due to the lack of clerical staff. Also, patients are not put on the system at night and that prohibits that staff member from creating the discharge summary. To create the electronic summary, the junior doctor would take the patient notes, find a terminal, log in and create a new document under the patient's electronic health record, populate it, and file it for electronic signature. After being reviewed and signed, the department secretary would print it out as a letter and post it to the GP.

The consultant linked the researcher (HZ) with a Senior House Officer and a group of Junior Doctors, as well as a ward receptionist and extended an invitation to present the research study and findings to the Department at the regular Grand Round Meeting, which successfully generated valuable discussion on the types of discharge summaries used and departmental staff views and perspectives on the topic in general.

4.3.2.2. Sample Size and Power Calculations

An exploratory prospective sample size calculation was conducted for the research studies in Nephrology and Paediatrics.

As explained within objectives earlier in this chapter (see 4.3.1), the case studies in The Nephrology and Paediatrics Departments compared the results of how complete a discharge summary document would be when prepared using a handwritten system with those prepared using an electronic system.

In consultation and discussions with a statistician in the Department of Primary Care (CC) the researcher (HZ) briefly summarised the basic premise of the studies, and the process of analysis that led to the collection of the information we used as the baseline values in the sample size and power calculations. From the baseline data (collected in the Pilot HCOP study, see Table 3) the means of the two sets were compared to assess improvements in completeness and presence of data items, testing for significance using an independent (two-sample) T-Test. The results for the baseline data showed that there was no significant difference between the two sets (the outcome data being mean number of items present on the discharge summary).

Table 3. Baseline Data from Pilot Study

Summary Type	Mean Summary Completeness for the Set
Unstandardised	41.4% (std. dev. 6.14)
Standardised	43.8% (std. dev. 7.14)

If the handwritten system gave a 40% result of completion then it was decided that an important difference (improvement) to detect would be 20%, it was then important to know what sample size to collect and assess (in terms of patient records with discharge summaries). It was agreed that

carrying out the power calculation based on an improvement from 40-60% with a power of 80% and significance level of 0.05 was sensible.

These calculations were carried out using a computer software program (nQuery) using the data from the Pilot Study in HCOP. The data were unpaired (i.e. there were two separate sets of documents, one prepared using a handwritten system and one set using an electronic system).

With 46 records in each set (handwritten and electronic), with a standard deviation of 6.77 and with a 5% two-sided significance level and 80% power, a 4% absolute improvement could be detected (e.g. from a mean of 41.4% to 45.4% or from 40% to 44%).

To detect a 5% improvement (from a mean of 41.4% to 46.8%) it would be necessary to have 30 records in each set, assuming a standard deviation of 6.77, and with a 5% two-sided significance level and 80% power.

Furthermore, to detect a significant improvement from 40% in the handwritten set to 60% in the electronic set (the required difference of 20%) the sample only needed to consist of four records in each set.

This suggests that maintaining the sample size of 100 records (50 handwritten and 50 electronic) used in the Pilot HCOP study was more than adequate number to detect a 5% improvement in the mean number of items recorded, but was underpowered for detecting smaller improvements (of which the immediate relevance to the overall study purpose was debateable).

The results of the calculations were reassuring, and the collection of the data progressed accordingly (100 records each for the samples in Nephrology and Paediatrics).

4.3.2.3. Samples

The Nephrology Department

One hundred discharge summaries were selected from the hospital database NotIS for inpatients from the Nephrology Department at City Hospital. Fifty were handwritten discharge summaries for consecutive inpatients admitted between November and December 2009 and 50 were electronic discharge summaries for consecutive inpatients between December 2009 and February 2010.

The Paediatrics Department

One hundred discharge summaries were selected from the hospital database NotIS for inpatients from the Paediatrics Department at the Queen's Medical Centre. Fifty were handwritten discharge summaries for consecutive inpatients admitted between December 2009 and January 2010 and 50 were electronic discharge summaries for consecutive inpatients admitted between January and February 2010.

As for the handwritten set of records, these were assessed in hard copy, patient notes and discharge summaries had to be obtained from the hospital case note library; they were not maintained in electronic record format by the hospital.

4.3.2.4. Analysis

Data Management and Statistical Testing For the Nephrology and Paediatrics Departments

The data management and statistical testing protocols were used in the pilot study analysis were enhanced to conduct the analysis for the studies in Nephrology and Paediatrics.

Patient ages at the time of discharge were calculated using the patient date of birth and the discharge dates, and an average patient age was calculated for each dataset. The average length of inpatient stay was calculated for each set using the dates of admission and discharge recorded.

The interval between the date of discharge and the date the discharge summary was created and sent was calculated and an average obtained for each set. Data were categorised according to if the discharge summary was created prior to discharge of the patient, on the day of discharge, 1 day post-discharge, within 2-7 days post-discharge, more than 7 days post-discharge or not created at all.

To assess the sample, histograms were used to plot the distribution of patient age at the time of discharge, the duration of stay, and the time taken to create and send the discharge summary (timeliness). This was done in order to decide whether non-parametric statistical testing was required (Mann-Whitney U Tests).

A combined dataset was then created, merging the two sets (handwritten and electronic), maintaining the codes assigned (p1-p100).

Non-parametric statistics were used to assess discharge summary completeness data as the data were categorical (item present or not present). The Chi Square Test was used to investigate whether there were statistically

significant differences in the level of completeness between the two types of summaries overall and in particular checklist items. The Chi Square Test was performed for each type of summary, for each discharge summary (each record in the sample) and for each item in the checklist across the sample (split by type). Crosstabs, contingency tables, Odds Ratios, Relative Risk and 95% CI were also calculated.

Parametric statistics in the form of the Independent Samples T-Test were conducted to assess statistical significance in the difference of percentages of completeness between the two types of summaries. Error bars were then used to display the findings.

Visual Representation of the Study Findings

As with the pilot study in HCOP, the data collected were incorporated into a Microsoft Excel 2007 file in a manner visually representing the findings of the studies (see appendix-4-iii, B-5-iii).

4.3.3. Results from Nephrology

Sample Demographics

The sample assessed was complete; there were no records with missing discharge summaries. The histograms showed that the sample demographical data were non-normally distributed; they were skewed. Non-parametrical statistical testing (median, inter-quartile range) was used to calculate the median age at time of discharge and the median duration of stay. The Mann-Whitney U-Test was used to assess significance between the two summary types.

The samples for the patients about whom the discharge summaries were written were similar in terms of the age (median 63.7 years handwritten, median 67.8 years electronic), sex (proportion male 44% handwritten, proportion male 44% electronic) and length of hospital stay (median 5 days handwritten, median 5 days electronic).

There was no significant difference between the handwritten and electronic summary patient groups in terms of median age of patient at the time of discharge $p=0.461$. There was no significant difference between the handwritten and electronic summary patient groups in terms of the duration of stay in hospital $p=0.760$.

Timeliness: The Interval between Patient Discharge and the Creation and/or Transmission of the Discharge Summary

The data on the time intervals between the date of discharge and the date the discharge summary was created and sent were also plotted using histograms. As the data were non-normally distributed, non-parametrical statistical testing (Mann-Whitney U-Test) was used to assess statistical significance between the two summary types. The electronic discharge summaries were created and transmitted within a statistically significantly shorter time than the handwritten discharge summaries (electronic median 0 days IQR 9.5; handwritten median 4 days IQR 2.00, $p<0.001$).

In the electronic discharge summary set, the highest percentage of summary creation occurred pre-discharge or on the day of discharge (32%, median 0 days), while in the handwritten discharge summary set the highest percentage of summary creation occurred more than 7 days post-discharge (38%, median 4 days) (see Table 4).

Table 4. Nephrology Discharge Summary Timeliness Percentages

Handwritten			Electronic		
Discharge Summary Created	N	%	Discharge Summary Created	N	%
Pre-Discharge	0	0%	Pre-Discharge	16	32%
Day of Discharge	1	2%	Day of Discharge	16	32%
1 Day Post-Discharge	12	24%	1 Day Post-Discharge	4	8%
2-7 Days Post-Discharge	18	36%	2-7 Days Post-Discharge	9	18%
More Than 7 Days Post-Discharge	19	38%	More Than 7 Days Post-Discharge	5	10%
No Summary Created	0	0%	No Summary Created	0	0%
Total	50	100%	Total	50	100%

Completeness: The Discharge Summaries

When assessing the two summary types by how likely they were to be completed, there was no difference; summaries were available for all patients selected in the sample. The data on completeness was normally distributed and an Independent Samples T-Test was conducted to establish significance between the two types of summaries.

In both sets, the mean completeness was 51%. In the handwritten set, the discharge summary with the highest percentage completeness scored 84.2%. The discharge summary with the lowest percentage completeness scored

36.8%. In the electronic set, the discharge summary with the highest percentage completeness scored 66.7%. The discharge summary with the lowest percentage completeness scored 38.6%.

Based on the above results, and in conducting the Independent Samples T-Test, there was no statistical significance found between the two summary types in terms of completeness ($p=0.861$).

When assessing each checklist item across the sample, the Chi Square Test (odds ratios and 95% confidence intervals) was used to ascertain if each item was more likely to be present on a particular type of discharge summary. Several checklist items were found to be constant across the samples (consistently not present at 0%, or consistently present at 100%) and therefore odds ratios could not be calculated for these items (see Table 5).

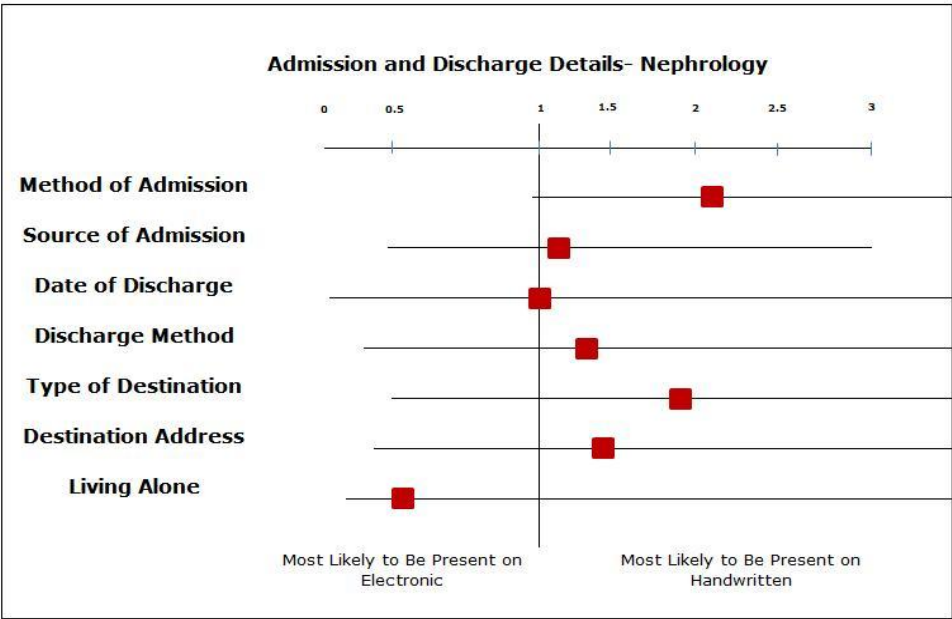
Table 5. Nephrology Scoring

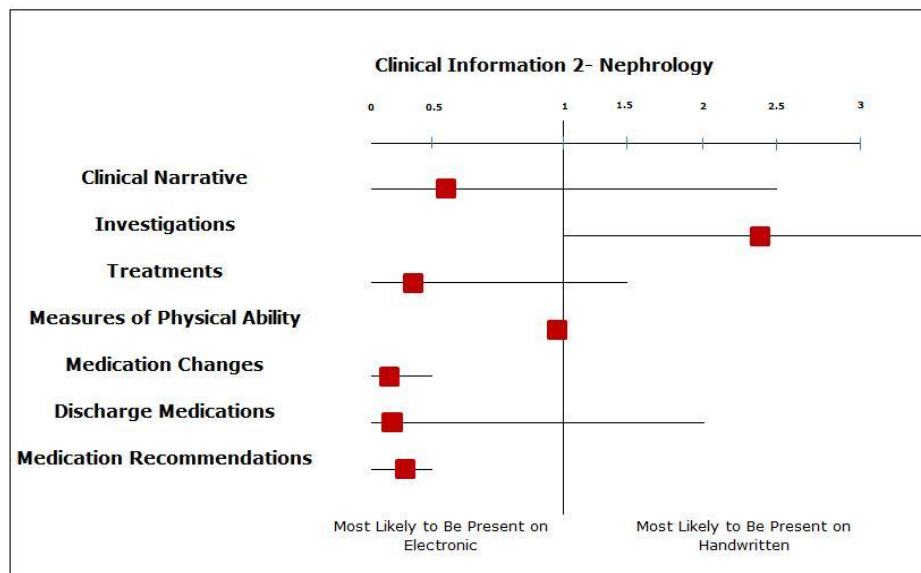
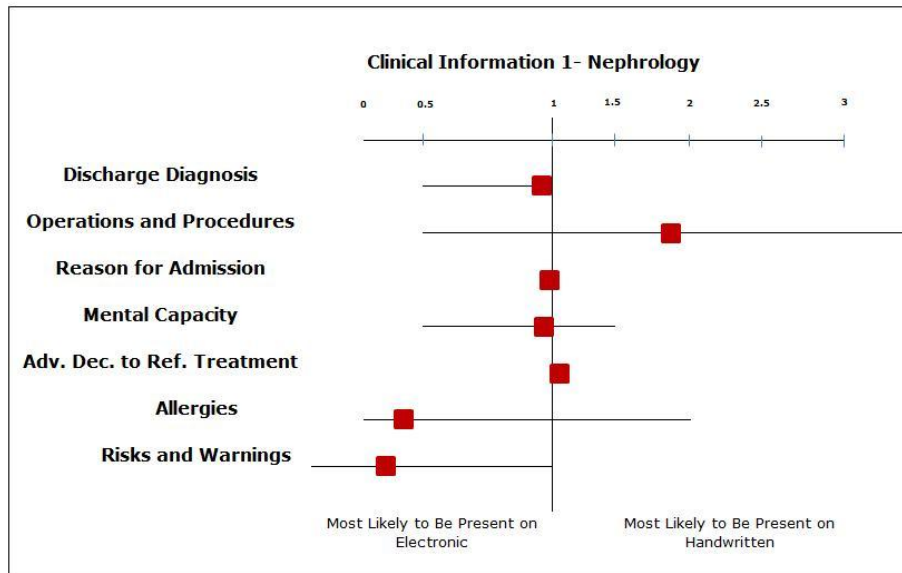
Data Item	Summary Type		OR	95% CI	P Value
	Handwritten	Electronic			
N=57					
GP Details	Present	Present			
GP Name	100%	100%			
GP Address	100%	100%			
GP Practice Code	0%	0%			
Patient Details					
Patient Surname, Forename	100%	100%			
Name Known As	0%	0%			
Date of Birth	100%	100%			
Gender	0%	0%			
NHS Number	100%	100%			
Patient Address	100%	100%			
Patient Telephone	0%	0%			
Admission Details					
Method of Admission	46%	28%	2.190	0.954-5.028	0.62
Source of Admission	22%	20%	1.128	0.431-2.956	0.80
Hospital Site	100%	100%			
Responsible Trust	100%	100%			
Date of Admission	100%	100%			
Time of Admission	0%	0%			
Discharge Details					
Date of Discharge	100%	98%	1.000	0.061-16.444	1.00
Time of Discharge	0%	0%			
Discharge Method	10%	8%	1.278	0.322-5.066	0.72
Type of Destination	14%	8%	1.872	0.512-6.848	0.33
Destination Address	14%	10%	1.465	0.432-4.969	0.53
Living Alone	4%	6%	0.653	0.104-4.085	0.64
Discharging Consultant	100%	100%			
Discharging Specialty/ Department	100%	100%			
Clinical Information					
Diagnosis at Discharge	94%	100%	0.940	0.876-1.008	0.07
Operations and Procedures	64%	50%	1.778	0.798-3.958	0.15
Reasons for Admission and Presenting Complaints	98%	100%	0.980	0.942-1.020	0.31
Mental Capacity	6%	0%	0.940	0.876-1.008	0.07
Advance Decisions to Refuse Treatment and Resus Status	0%	2%	1.020	0.981-1.062	0.31
Allergies	4%	10%	0.375	0.069-2.031	0.24
Risks and Warnings	10%	30%	0.259	0.086-0.782	0.01
Clinical Narrative	90%	94%	0.574	0.130-2.545	0.46
Relevant Investigations and Results	70%	50%	2.333	1.027-5.300	0.04
Relevant Treatments and Changes Made to Treatments	84%	94%	0.335	0.083-1.346	0.11
Measures of Physical Ability and Cognitive Function	4%	0%	0.960	0.907-1.016	0.15
Medication Changes	38%	76%	0.194	0.082-0.459	0.00
Discharge Medications	90%	98%	0.184	0.021-1.633	0.09
Medication Recommendations	32%	62%	0.288	0.127-0.658	0.00
Advice Recommendations and Future Plan					
Hospital Action	90%	84%	1.714	0.520-5.657	0.37
Person Responsible for Hospital Action	82%	68%	2.144	0.842-5.459	0.10
Appropriate Date and Time for Hospital Action	54%	46%	1.378	0.628-3.026	0.42
GP Action	12%	18%	0.621	0.203-1.899	0.40
Person Responsible for GP Action	12%	16%	0.716	0.229-2.238	0.56
Appropriate Date and Time for GP Action	8%	10%	0.783	0.197-3.103	0.72
Suggested Strategies for GP Action	12%	16%	0.716	0.229-2.238	0.56
Community and Specialist Services Action	12%	4%	3.273	0.627-17.071	0.14
Person Responsible for Community and Spec Services Action	12%	4%	3.273	0.627-17.071	0.14
App Date and Time for Community and Spec Services Action	10%	2%	5.444	0.612-48.397	0.92
Information Given to Patient or Authorized Representative	12%	8%	1.568	0.414-5.935	0.50
Patient's Concerns, Expectations and Wishes	6%	8%	0.734	0.156-3.462	0.69
Results Awaited	16%	12%	1.397	0.447-4.367	0.56
Person Completing Summary					
Doctor's Name	100%	100%			
Doctor's Grade	100%	100%			
Doctor's Specialty	98%	96%	2.042	0.179-23.266	0.55
Date Discharge Record Completed	100%	100%			
Doctor's Signature	100%	100%			
Distribution List	100%	76%	1.316	1.126-1.538	0.00

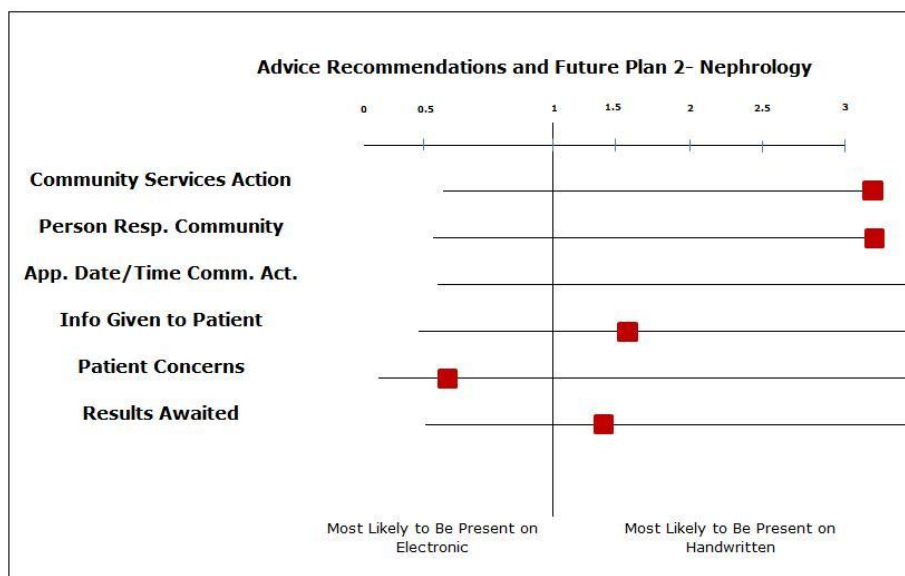
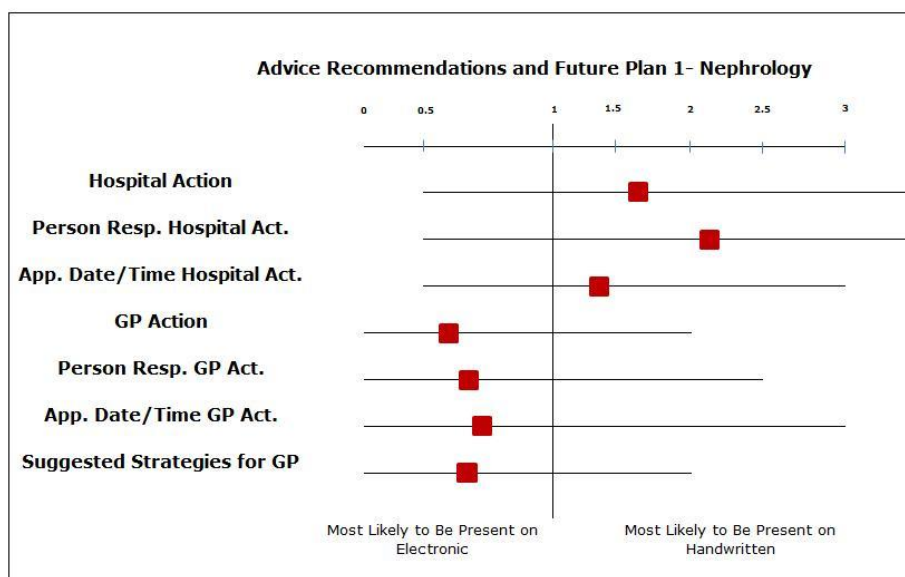
Odds Ratio Plots- Error Bars

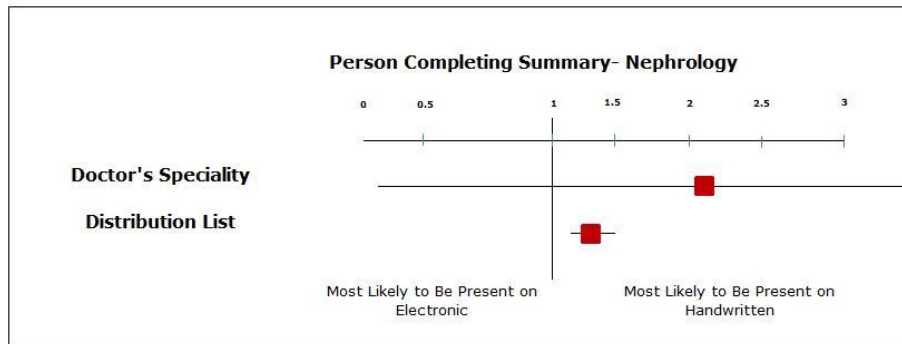
The odds ratio plots shown below were used to more clearly depict the likelihood of a checklist item presence on one type of discharge summary over another. The items not plotted were consistent across both summary types (i.e. GP name was always present on both types of summaries) (see Fig. 2).

Fig 2. Nephrology Odds Ratio Plots (Error Bars)









4.3.4. Results from Paediatrics

Sample Demographics

After assessing within NotIS, several records were discarded from the sample as they did not contain a discharge document on file. Therefore the final handwritten set consisted of 48 records, and the final electronic set was 42 records.

The histograms showed that the sample demographical data were non-normally distributed; they were skewed. Non-parametrical statistical testing (median, inter-quartile range) was used to calculate the average age at time of discharge and the average duration of stay. The Mann-Whitney U-Test was used to assess significance between the two summary types.

The proportion of male patients was higher in both groups. The average lengths of stay were comparable, with the same median of 1 day. The histograms were skewed to the left.

There was a significant difference between the handwritten and electronic summary patient groups in terms of average age of patient at the time of discharge (handwritten set median age 0.92 years range 12.5, electronic set median age 2.5 years range 18.8, $p=0.006$). This was due to the fact that the

sample was in the Paediatrics ward and some patients were infants (less than 1.0 yrs). There was no significant difference between the handwritten and electronic summary patient groups in terms of the duration of stay in hospital ($p=0.283$).

Timeliness: The Interval between Patient Discharge and the Creation and/or Transmission of the Discharge Summary

The data on the time intervals between the date of discharge and the date the discharge summary was created and sent were also plotted using histograms. As the data were non-normally distributed, non-parametrical statistical testing (Mann-Whitney U-Test) was used to assess statistical significance between the two summary types. The handwritten discharge summaries were created and transmitted within a statistically significantly shorter time than the electronic discharge summaries (handwritten median 2 days IQR 3; electronic median 27 days IQR 14, $p<0.001$).

In the electronic discharge summary set, it was found the highest percentage of summary creation occurred more than 7 days post-discharge (81%, median 27 days), while in the handwritten discharge summary set it was found that the highest percentage of letter creation occurred within 2-7 days of discharge (39.5%, median 2 days) (see Table 6).

Table 6. Paediatrics Discharge Summary Timeliness Percentages

Handwritten			Electronic		
Discharge Summary Created	N	%	Discharge Summary Created	N	%
Pre-Discharge	0	0%	Pre-Discharge	0	0%
Day of Discharge	3	6%	Day of Discharge	0	0%
1 Day Post-Discharge	18	37.5%	1 Day Post-Discharge	0	0%
2-7 Days Post-Discharge	19	39.5%	2-7 Days Post-Discharge	0	0%
More than 7 Days Post-Discharge	6	12%	More than 7 Days Post-Discharge	34	81%
No Summary Created	2	4%	No Summary Created	8	19%
Total	48	100%	Total	42	100%

Completeness: The Discharge Summaries

When assessing the summary types by how likely they were to be completed, it was found that a greater number of electronic discharge summaries had not been completed and not sent (19%) compared with the handwritten sample (4%) (8/42 electronic summaries missing, 2/48 handwritten summaries missing, t-test 2.269, df=88, p=0.0257). This was significant.

The data on completeness was normally distributed and an Independent Samples T-Test was conducted to establish significance between the two types of summaries.

In the handwritten set, the mean completeness was 27% (std. dev. 3.87). The discharge summary with the highest percentage completeness scored 46%. The discharge summary with the lowest percentage completeness scored 23%. In the electronic set, the mean completeness was 36% (std. dev. 2.94). The discharge summary with the highest percentage completeness scored 54%. The discharge summary with the lowest percentage completeness scored 28%.

Based on the above results, and in conducting the Independent Samples T-Test, there was a statistically significant difference found between the two summary types in terms of completeness ($p < 0.0001$) with an improvement seen for the electronic summaries.

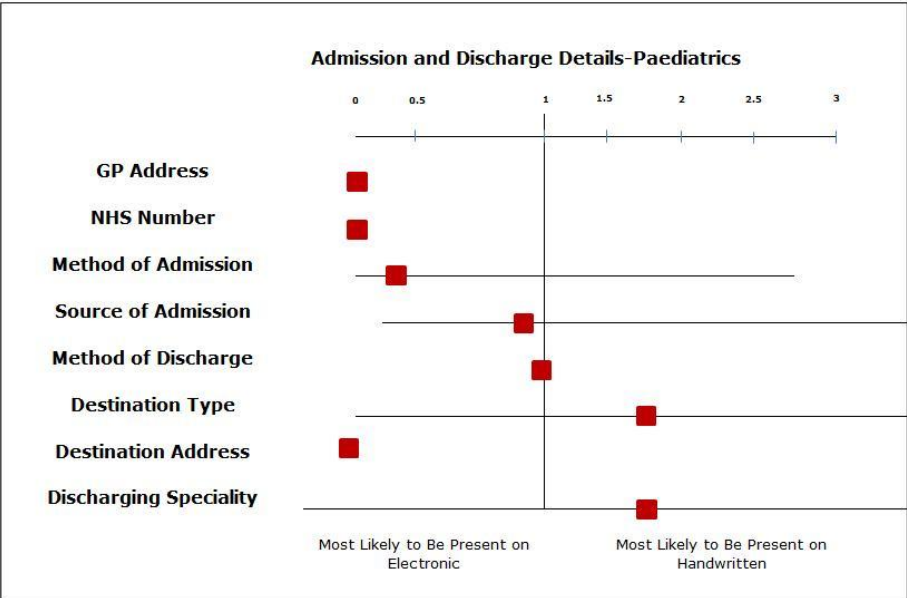
When assessing each checklist item across the sample, the Chi Square Test (odds ratios and 95% confidence intervals) was used to ascertain if each item was more likely to be present on a particular type of discharge summary. Several checklist items were found to be constant across the samples (consistently not present at 0%, or consistently present at 100%) and therefore odds ratios could not be calculated for these items (see Table 7).

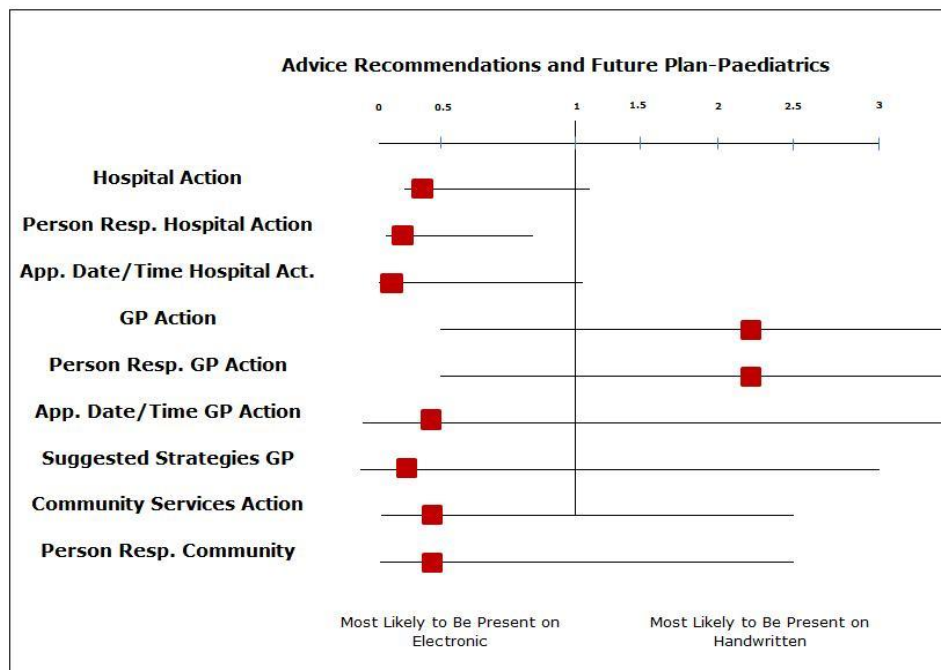
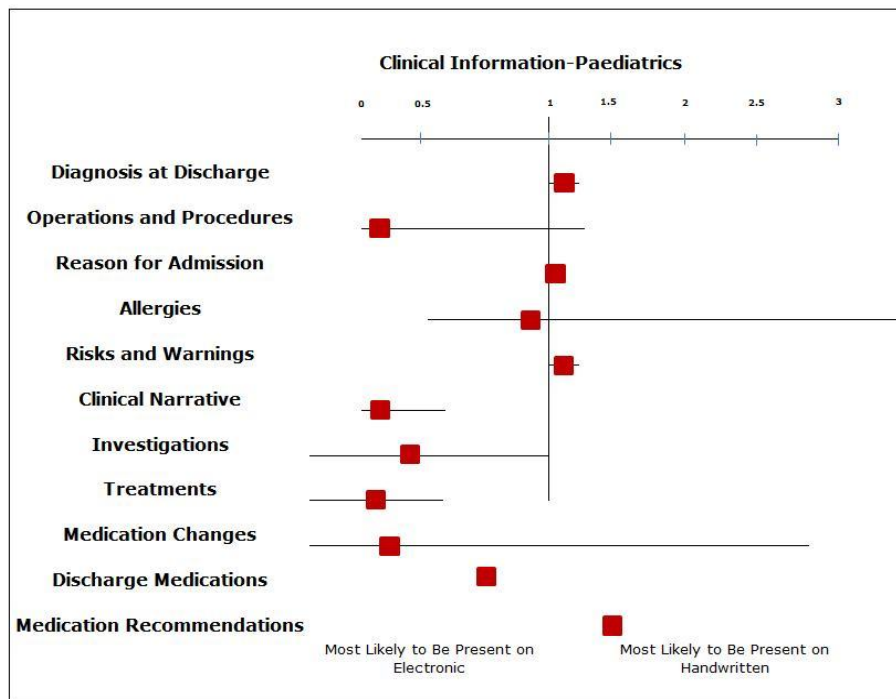
Table 7. Paediatrics Scoring

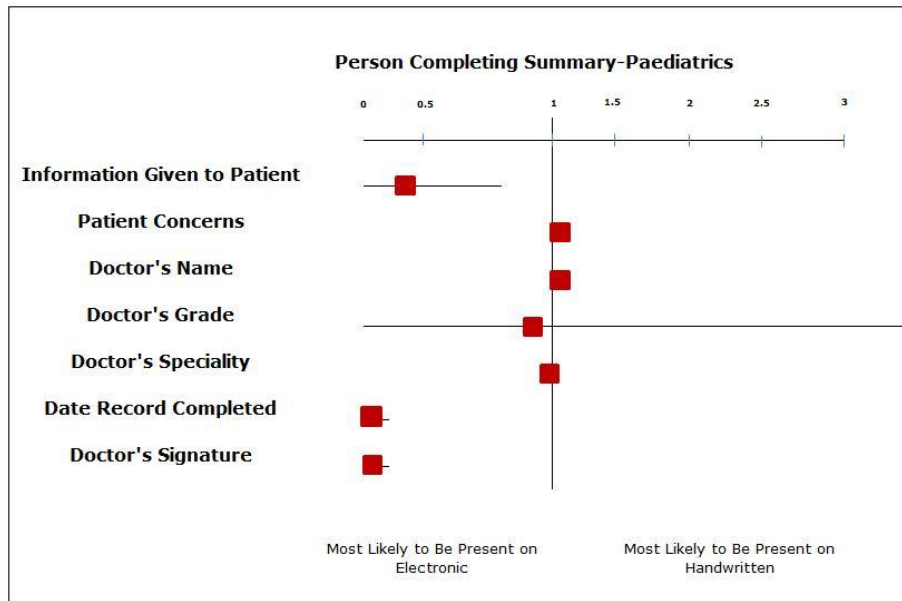
Data Item	Summary Type		OR	(95% CI)	P Value
	Handwritten	Electronic			
N=57	Present	Present			
GP Details					
GP Name	100%	100%			
GP Address	0%	100%			
GP Practice Code	0%	0%			
Patient Details					
Patient Surname, Forename	100%	100%			
Name Known As	0%	0%			
Date of Birth	100%	100%			
Gender	0%	0%			
NHS Number	0%	100%			
Patient Address	100%	100%			
Patient Telephone	0%	0%			
Admission Details					
Method of Admission	2.0%	7.1%	0.277	0.028-2.766	0.24
Source of Admission	4.1%	4.7%	0.870	0.117-6.459	0.89
Hospital Site	100%	100%			
Responsible Trust	100%	100%			
Date of Admission	100%	100%			
Time of Admission	0%	0%			
Discharge Details					
Date of Discharge	100%	100%			
Time of Discharge	0%	0%			
Discharge Method	2.0%	0%	0.979	0.940-1.020	0.34
Type of Destination	4.1%	2.3%	1.783	0.156-20.392	0.63
Destination Address	4.1%	97.6%	0.001	0.000-0.012	0.00
Living Alone	0%	0%			
Discharging Consultant	100%	100%			
Discharging Specialty/ Department	4.1%	2.3%	1.783	0.156-20.392	0.63
Clinical Information					
Diagnosis at Discharge	100%	95.2%	1.050	0.981-1.123	0.12
Operations and Procedures	4.1%	14.2%	0.261	0.50-1.370	0.09
Reasons for Admission and Presenting Complaints	100%	97.6%	1.024	0.977-1.074	0.28
Mental Capacity	0%	0%			
Advance Decisions to Refuse Treatment and Resus Status	0%	0%			
Allergies	2.0%	2.3%	0.872	0.53-14.392	0.92
Risks and Warnings	0%	4.7%	1.050	0.981-1.123	0.126
Clinical Narrative	22.9%	54.7%	0.246	0.099-0.608	0.00
Relevant Investigations and Results	41.6%	61.9%	0.440	0.188-1.025	0.05
Relevant Treatments and Changes Made to Treatments	54.1%	85.7%	0.197	0.070-0.554	0.00
Measures of Physical Ability and Cognitive Function	0%	0%			
Medication Changes	2.0%	7.1%	0.277	0.028-2.766	0.24
Discharge Medications	41.6%	64.2%	0.714	0.305-1.672	0.43
Medication Recommendations	0%	26.1%	1.355	1.131-1.622	0.00
Advice Recommendations and Future Plan					
Hospital Action	10.4%	23.8%	0.372	0.116-1.195	0.08
Person Responsible for Hospital Action	6.2%	23.8%	0.213	0.054-0.837	0.01
Appropriate Date and Time for Hospital Action	2.0%	14.2%	0.128	0.015-1.108	0.03
GP Action	14.5%	7.1%	2.220	0.536-9.199	0.26
Person Responsible for GP Action	14.5%	7.1%	2.220	0.536-9.199	0.26
Appropriate Date and Time for GP Action	2.0%	4.2%	0.426	0.037-4.869	0.48
Suggested Strategies for GP Action	2.0%	7.1%	0.277	0.028-2.766	0.24
Community and Specialist Services Action	4.1%	9.5%	0.413	0.072-2.379	0.30
Person Responsible for Community and Spec Services Action	4.1%	9.5%	0.413	0.072-2.379	0.30
App Date and Time for Community and Spec Services Action	0%	0%			
Information Given to Patient or Authorized Representative	4.1%	21.4%	0.159	0.032-0.787	0.01
Patient's Concerns, Expectations and Wishes	0%	2.3%	1.024	0.977-1.074	0.28
Results Awaited	2.0%	0%	0.979	0.940-1.020	0.34
Person Completing Summary					
Doctor's Name	100%	97.6%	1.024	0.977-1.074	0.28
Doctor's Grade	2.0%	2.3%	0.872	0.053-14.932	0.92
Doctor's Specialty	2.0%	0%	0.979	0.940-1.020	0.34
Date Discharge Record Completed	4.1%	100%	0.042	0.011-0.162	0.00
Doctor's Signature	97.9%	0%	0.021	0.003-0.145	0.00
Distribution List	0%	0%			

Fig. 3. Paediatrics Odds Ratio Plots (Error Bars)

The odds ratio plots shown above clearly depict the likelihood of a checklist item presence on one type of discharge summary over another. The items not plotted were consistent across both summary types (i.e. GP name was always present on both types of summaries).







4.4. Discussion

4.4.1. Main Findings

The studies returned interesting mixed results. The pilot study in HCOP found no significant difference in the proportion of summaries being completed or in the number of items of information present on the discharge summaries before and after the introduction of a standardised template. This study did not collect data on the timeliness of discharge summaries. The high rate of missing discharge summaries was not improved with the introduction of the standardised template. While there was an assumption that the introduction of a standardised template for the creation of discharge summaries filled in by hand would improve overall completeness, the data collected did not show a difference between the two methods of preparing the summary.

Introducing a standardised discharge summary template saw the addition of a header to the document, with the Trust and NHS logo, the name of the hospital and the ward, with contact information (Telephone, Campus, Website...). This had an impact by increasing the proportion of items automatically present on the discharge summary. Thus, having introduced the standardised template, all summaries had administrative details automatically inserted and therefore only clinical details were dependent on the information inserted by the doctor preparing the summary, either by free choice or when prompted by the standardised template. It was not clear that the standardisation of the process had any particular benefits. Indeed, standardisation might have been detrimental (i.e. the omission of the clinical narrative as an item on the template). It is worth noting that in relation to medications, the use of a standardised template had little potential to bring about improvements, as medications were already almost uniformly reported before its introduction.

In Nephrology, there was no significant difference in the proportions of summaries being completed or in the number of items of information present on the discharge summary before and after the introduction of the electronic discharge summary. Significant improvement with the electronic summaries was found only for information on medication changes and recommendations. As for timeliness, the electronic discharge summaries were significantly more rapidly completed and sent to primary care: most (32%, 16/50) were completed pre-discharge or on the day of discharge (median 0 days), reduced from a median of 4 days in the handwritten set, $p < 0.001$).

In Paediatrics, there was no significant difference in the proportion of summaries being completed before and after the introduction of the electronic discharge summary. In terms of content, there was a significant improvement in the number of items of information present on the electronic discharge summaries (mean 27% in handwritten set, 36% in electronic set, $p < 0.0001$)

As for timeliness, the introduction of the electronic summary negatively affected the speed within which summaries were completed and sent out; this was significant. The handwritten summaries were more likely to be done sooner than the electronic summaries (median 2 days vs. 27 days for the electronic summaries, $p < 0.001$). 84% of electronic summaries took over 7 days to be completed, while most of the handwritten (38%) were sent within 1 week. This difference in timeliness could be due to several factors, not least of which is that handwritten summaries had been in use for a longer period of time in the department and had become automatic practice for staff. It could also be due to the fact that there were less staff involved in the completion of the handwritten summary, and less technology required (pen, paper, fax machine), therefore less potential for delay.

Though the electronic summaries in Paediatrics were significantly slower, they were more likely to contain required content, specifically medication recommendations (0% handwritten vs 26.1% electronic, $p=0.00$) this was statistically significant. This indicates that the changes introduced in this department impacted positively on content (completeness) but negatively on timeliness.

4.4.2. Strengths and Limitations of the Study

One of the limitations of the studies was due to the use of the hospital information system NotIS. The names of the documents for discharge communication that were uploaded onto NotIS varied greatly, even though they might refer to the same purpose. The discharge document was alternately titled: All Day Discharge Note, All-Day Discharge Document, In-patient discharge, Discharge Summary, Discharge Letter, Letter to GP, Summary Note, and All-In-One Discharge Document. This made the location of the exact document more complicated; having to refer to the date of admission recorded to locate the discharge document related to that hospitalisation episode.

Another limitation, specifically to the pilot study, was that the selection of the sample of records was not under the researchers' (HZ) control, the team of junior doctors was instructed by the department consultant to do so and then pass on the list of patient record numbers.

Also, the pilot study was not able to collect information on why some discharge summaries were missing (unstructured 15/50 structured 12/50); although the common assumption among the health care professionals involved was that they had not been written.

In this pilot study in HCOP, the timings of preparation and transmission of the discharge summaries were not recorded. This element was later modified in the studies in Nephrology and Paediatrics. This is important for further research as the time needed to complete the task of preparing and transmitting the discharge summary to the next point of care is believed to be crucial for patient safety (Witherington et al, 2008).

There was no information recorded on the relative importance of the missing items. For example in the 32 cases in the HCOP sample that did not have discharge medication present, this could have been due to an omission (there were discharge medicines and they were omitted), or due to no medications being prescribed on discharge (the patient didn't need any medicines).

As for the study in Nephrology, a limitation was that of the timing of the data collection, which occurred within the first month of the implementation of the electronic discharge summary; this could have had an effect on the study findings, as no electronic summaries were found to be missing or incomplete, and the electronic system had improved the speed in which summaries were generated, all elements that may have been a result of the Hawthorne effect, or the "newness" of the system and the interest generated within the department.

The study in Paediatrics may have been limited due to the significant difference in the average age of the patients between both the handwritten and electronic sets (handwritten median 0.92 years vs. electronic 2.5 years, $p=0.006$). This could have been due to a seasonal ailment affecting that particular age bracket, and which could have impacted on the ward and therefore on the quality of the discharge summaries assessed for those patients.

In considering the selection of the samples for Nephrology and Paediatrics, the researcher (HZ) questions if it would have been more methodologically sound to have maintained the sampling from consecutive years (retrospectively- as in HCOP) rather than consecutive sampling around the switchover between the two types, to allow for the “newness” to have dissipated.

4.4.3. Insight from the Use of the RCP Standards and Data Collection Tool

The Royal College of Physicians Standards for the Structure and Content of Medical Records and the associated definitions (see appendix B-1) were used as a gold standard. By choosing to design their own system locally, the hospital might have not taken full account of the recommendations of the RCP. Administrative items are automatically inserted into the discharge letters by the hospital computer administration system but these systems need to adapt to fit the RCP gold standards.

The structured HCOP template was developed by a local hospital consultant, and did not include “clinical narrative” as an item, indicating that in his opinion, the clinical narrative was not necessary information to impart to the GP on the discharge summary. However, if there is no agreement on or adherence to gold standards the local systems being developed will differ from one another (and potentially become incompatible). It may be that having a central steer, clinical leadership or at the very least local awareness of nationally set standards that were established by consensus is the way forward to increase the rates of success of computerisation efforts.

The standards were developed for use in general medicine. From the experience of using the data collection tool in these studies the researcher

(HZ) would recommend that the headings be tailored to suit the medical specialisation it is being used for, to suit their purposes more effectively.

As it stands, the list of headings contain a great number of items (57), which makes the summary quite lengthy. Unless some of the fields can be populated automatically (e.g. as part of a patient's routine care within the hospital or by the electronic system), it may not be feasible to complete all 57 items when considering issues of time and resources typically available to the health care professional (see Chapter 5 Health Care Professionals Perspectives).

The standards were used to evaluate the sample as if against a national benchmark; meaning that user (e.g. R1, R2, R3, R4, R5) of the data collection tool had to consider that they did not know the record was from this particular hospital and particular ward, and evaluate it according to what was physically stated on the summary, and not what they could infer from their own knowledge of the location.

If an item was not stated on the summary explicitly, then it was considered not present and scored as such. An example would be *Hospital Site*. The researcher (HZ) and other data collectors (R2, R3, R4, R5 in the pilot study) were aware that the sample of summaries was from Queen's Medical Centre, but in the unstructured sample, this information was not to be found anywhere on the discharge summaries. It was could certainly be inferred that the patient had been at QMC, but as it was not stated then if this were a universal system (as the SPINE is expected to be) any authorised health care professional could be in receipt of a discharge summary without the information as to which site the patient was admitted.

It should be noted that the presence of an item on the discharge summary is not necessarily an indication of the accuracy of the information. Names of medications, conditions, results of tests, dosages, instructions and other items can still be incorrect. It was not however within the scope of the research to investigate the accuracy of the information contained in the discharge summaries. This was partly because the researcher (HZ) is not clinically trained and did not have access to the detailed medical records.

4.4.4. Inter-Rater Reliability

It is important to consider the inter-rater reliability results of the pilot study, when considering the potential of using the data collection tool in other studies. Despite difficulties with some of the RCP definitions during the data collection phase (the exact meaning of some headings needed clarification), three of the junior doctors (R3, R4, R5) were in complete agreement with R1 (the researcher). This indicates the high reliability of the data collection instrument. The fact that there was poor agreement with R2 suggests that before using the tool it is important to check if potential raters can use it reliably. If this is not shown, then raters could be given more training on its use and on understanding the associated terminology to see if this improves their reliability. From this, the researcher (HZ) confirmed the suitability of the data collection tool for use in the further studies assessing discharge summary completeness.

4.5. Chapter Summary

The studies provided mixed results in the quality (completeness and timeliness) of the discharge summaries assessed when introducing changes in the discharge summary processing method (standardisation or electronification). In HCOP there was no significant difference in the

proportion of summaries being completed or in the number of items of information present on the discharge summaries before and after the introduction of a standardised template. This study did not collect data on the timeliness of discharge summaries.

In Nephrology, there was no significant difference in the proportions of summaries completed or the content of the discharge summary before and after the introduction of the electronic discharge summary. The timeliness however, improved significantly with the electronic system.

In Paediatrics, there was no significant difference in the proportion of summaries completed before and after the introduction of the electronic discharge summary. There was a significant improvement in electronic discharge summaries content. Most interestingly, the timeliness was significantly negatively affected after the introduction of the electronic system.

The following chapter will build on the findings from these studies using health care professionals' views to provide insight on the reasons for these mixed findings.

Chapter 5- Health Care Professionals' Perspectives

5.1 Context

This chapter details the research undertaken to assess health care professionals' perspectives on the issue of discharge summary communication between secondary and primary care. The previous chapter showed the mixed effect innovations in introducing standardisation and electronic systems had on discharge summary communication transferred in terms of quality (completeness and timeliness). However, the before and after studies do not extend to explain how such processes and outcomes are perceived by the users (health care professionals), the difficulties they experience or the problems that remain even after changes were introduced and so do not serve to fully clarify the conditions that are needed to ensure successful implementation of new systems or identify factors that hinder this.

5.2. Objectives

The objectives were to:

- Obtain the perspectives of secondary care physicians on current discharge communication issues, especially with the use of electronic discharge summary processes, identifying points of weakness or areas of concern
- Assess primary care views on discharge information communicated from hospital

To achieve these objectives, the study set out to a) observe and frame the discharge process as it typically occurs in each setting in secondary care, b) conduct interviews with secondary care professionals and c) conduct interviews with primary care professionals.

5.3. Methods

The methods for the qualitative research study are reported using the consolidated criteria for reporting qualitative studies (COREQ) 32-item checklist (Tong et al, 2007).

5.3.1. Researcher Characteristics and Reflexivity

Personal Characteristics

The interviews were conducted by the author as part of my research degree programme (PhD). I am female, have a BSc in Psychology, an MPH in Public Health, and am a Fellow of the Royal Society for Public Health. As I am not medically trained and not attached to the NHS, I have limited knowledge of the workings of the healthcare service, and have not had a role in the generation or communication of discharge summaries. I also possess fluent command of the English language.

I undertook training in the conduct of interviews, and the use of the qualitative software NVivo8. I had experience in the preparation of data collection forms, study documentation, and transcription and editing of long documents in word processing software.

Relationship with Participants

The researcher (HZ) had established contacts with several hospital consultants who were to be participants prior to the qualitative work through contact during other parts of the research (see Chapter 4). Thus, the participants were aware from the outset of the researcher's (HZ) area of interest and the aims of the study. At the time of the interviews, familiarity with much of the literature reviewed in Chapter 3 had already been established.

5.3.2. Study Design

Theoretical Framework

This has been discussed in Chapter 2 (2.2.4.1.) grounded theory principles of organising the data through a data-driven iterative approach, rather than sorting it according to prior theoretical frameworks were used.

Participant Selection

The sample of health care professionals interviewed and observed accumulated over the duration of the research degree project (2008-2011).

Secondary Care:

In secondary care, participants were contacted by e-mail; interview date and times were also arranged via e-mail. Initial interviews (1st wave) were conducted for three purposes: a) to assist in developing an understanding of discharge processes in hospital and clarify the research question, b) to receive feedback on data collection methods and tools, c) to establish contacts for the selection and determination of the departments to be studied and ascertain the potential to collect data for the quantitative elements of the research (see Chapter 4). These interviews were therefore considered “scoping” or preparatory interviews. This was necessary due to the fact that the researcher (HZ) did not have knowledge of the discharge summary process, and it was helpful to become orientated to the issues that were to be researched. As previously mentioned, the researcher (HZ) was not part of the local NHS organisation and it was therefore sensible to establish where innovations and changes were being introduced and the health care professionals involved, and sample purposively. This served to determine the appropriate permissions needed and ensure participants willingness to take part in the research study.

The selection of the participants was performed in a “snowballing fashion”. Individuals interviewed were asked to recommend others within the hospital or departments who were also involved in the evolution of the subject topic at the selected sites and could provide additional insight or information needed for the development of the research and the exploration of the issues being studied.

Thus the selection of the participants was data driven rather than theory driven, which was deemed appropriate to the nature of the hospital environment, and due to the influence of changes in health care staff rotations, the availability and interest of the health care professionals in participating in a research study on this topic at the time. The snowballing method was used as it offered the most suitable approach to conducting the study, which was continually developing, as the processes being studied were evolving at the time within the settings.

The second wave of interviews (main interviews) was conducted after the results had been established for the quantitative part of the research (see Chapter 4), and after the interviews had been conducted in primary care. These interviews (2nd wave) were more targeted to specific individuals, returning to the studied departments to report results of the studies and gain the healthcare professionals feedback and opinions of the reasons and understanding of the research results, as well as their expectations for future practice within the subject topic. The reasoning was to use the second wave to feedback results to the participating departments, obtain views from the health care professionals as to their opinions of the research results and find out if any changes had been introduced since the research data had been collected. It was also reasoned that returning to secondary care would

complete a full circle of obtaining perspectives from secondary care to primary care and returning to secondary care.

Primary Care:

The primary care sample was obtained by sending out formal letters to general practitioners in the local area with telephone follow-up shortly after to arrange an interview date and time (see appendix C-1). Incentives in the form of a £50.00 payment were offered to encourage participation. Participants were given a form to sign and send to the Department of Primary Care to obtain the payment. After the posting of formal letters and telephone follow-up, interviews were secured with general practitioners over the course of a 4-week period (September-October 2010).

Settings

The part of the study in secondary care was carried out within the Nottingham University Hospitals NHS Trust, at two general hospital sites (City Hospital and the Queen's Medical Centre), with health care professionals from three hospital departments: Health Care of Older People, Nephrology and Paediatrics (see Chapter 4).

The primary care part of the study was carried out in three GP surgeries all of which received discharge summaries from the Nottingham University Hospitals Trust. The general practitioners had been practicing in the area for a number of years, ranging from three to twenty-four years. This offered a wealth of experience and insight into the ways discharge summaries have been managed over time in the area, and the positive and negative aspects of the various discharge types and the systems used.

Interviews were undertaken in the participants' workplace. Observations and corresponding field notes were taken to accompany the interviews. Meeting health care professionals within their work environment (their offices or on the wards in the departments where they were stationed) and observing the ways in which they conducted their usual routines in processing discharge information and completed these tasks provided precious insight into the complexity of the problem, as interviews and observations could be undertaken at the same time. Conducting these observations as a non-participant during the course of the interviews and the time spent therefore in the particular department or hospital ward offered the researcher (HZ) with the opportunity to see first-hand how health care professionals perform, how they conduct themselves usually, handle routine situations and deal with paperwork or computer processes related to the study topic. Observations were also made on the way in which the health care professional conducted their typical workday, managing their tasks while engaging in the interview, the interruptions, the coping skills, the behaviours, the attitudes, the techniques used, and the general atmosphere. This was in order to provide context to the study and understand hospital and department specific culture and working processes.

The field notes were made during and after each visit to the hospital departments, and consisted of points noted on the setup and size of the location, the organizational capabilities of the individual being interviewed; the ability to multi-task (i.e. talking to the researcher while typing on a keyboard), the level of disturbances or interruptions, the behavior of the health care professional and attitude towards the subject topic, and the general atmosphere in the department at the time. There were no non-participants present at the time of the interviews being conducted.

Data Collection

Semi-structured open-ended interviews and non-participant observation methods were used in secondary care, and structured interviews were used in primary care. Participants were asked at the outset to read an information sheet on the study and sign an interview consent form. In secondary care, the interview with each health care professional was of a maximum of 60 minutes. All interviews were conducted using an interview guide (see appendix B-8). In primary care, the interview with each general practitioner was of a maximum thirty minutes duration, and they were all asked the same set of questions (see appendix C-4) as part of a discussion on the quality of discharge summaries they received as part of their usual communication with secondary care. The interviews with general practitioners were to obtain perspectives on the various types of discharge summaries being received, in terms of their structure, content and timeliness, and its effect on general practices' ability to continue the care of the patient once they have been discharged from hospital.

Audio recordings were not used for the first wave of interviews in secondary care, but this was later amended and recordings were made for all subsequent interviews (2nd wave secondary care and primary care). Field notes were made for all interviews.

The concept of data saturation was discussed as part of the methodology for the qualitative study (see Chapter 2). The researcher (HZ) asserted that saturation had been achieved when later interviews confirmed and repeated many of the issues seen in the first wave. Transcripts of the interviews were not returned to the participants for comments and checking due to time constraints.

5.3.3. Analysis and Findings

Data Management and Analysis

Study files were created to manage the sample of participants and ensure that all ethical considerations were met. The researcher (HZ) established a filing system in a secure office location accessible only to her, with a folder for each participant that included demographic information, dates and times for interviews, initial contact letters, participant information sheets and signed consent forms, as well interview transcript(s) (see also Chapter 2, section 2.3).

As the interviewer, the researcher (HZ) listened to all the audio recordings and transcribed them verbatim personally into word processing software Microsoft Word 2007. A template for the transcription of the interviews was created, with the date of the interview, the duration, the location and the code for the interviewee. The conversation was then transcribed word for word with extraneous sounds, gestures, actions or interspersed remarks to other people enclosed in brackets to detail the context of the interview.

The researcher (HZ) was the only coder for the collected data. The health care professionals' names were anonymised using a combination of numbers and letters, and the transcripts were then entered into the QSR NVivo 8 software package. All the data were then coded and examined line by line.

Each interview was analysed independently. The main categories and themes were identified and coded in NVivo 8 using an ongoing comparison, using thematic analysis of the data in order to categorize patterns found within the interviews. The varying views of the health care professionals were compared

using the data to form a thorough description of the issues described, and locate commonly appearing issues.

The interviews were read carefully, highlighting key points and placing them into categories that gradually emerged from analyzing the data (these formed the coding tree in the software package): definitions of discharge, the purpose of discharge summaries, perceived barriers to effective discharge summaries, the timing of discharge summaries, the structure and content of discharge summaries, the process of generating summaries, and the problems with discharge summaries, proposed solutions and electronic methods. These categories were further broken down and used to develop the themes, which would serve to build the discussion of the discharge summary topic in question. The coding strategy and tree developed over the course of the conduct of the data collection, transcription and analysis phase, and the same strategy was used for the interviews from both care sectors.

The researcher (HZ) ensured to keep clear and detailed descriptions of the fieldwork and data collection as well as the procedures for data analysis and the coding strategy, maintaining their direct relevance to the research question.

Reporting

Quotations from the data collected in the interviews were selected and presented to support the issues and developing themes in the results of the study, within the categories created in the software package. The use of the software package NVivo allowed the researcher (HZ) to exercise flexibility in working back from the organised, analysed findings to the original data collected. The quotes were used to provide a clear point of reference to the perspectives of the health care professionals and justify inferences made. This

served to fulfil the objectives of the study. Within the described major themes, several minor themes were presented, to assist in developing the understanding of the issue of discharge communication as told by the interviewees.

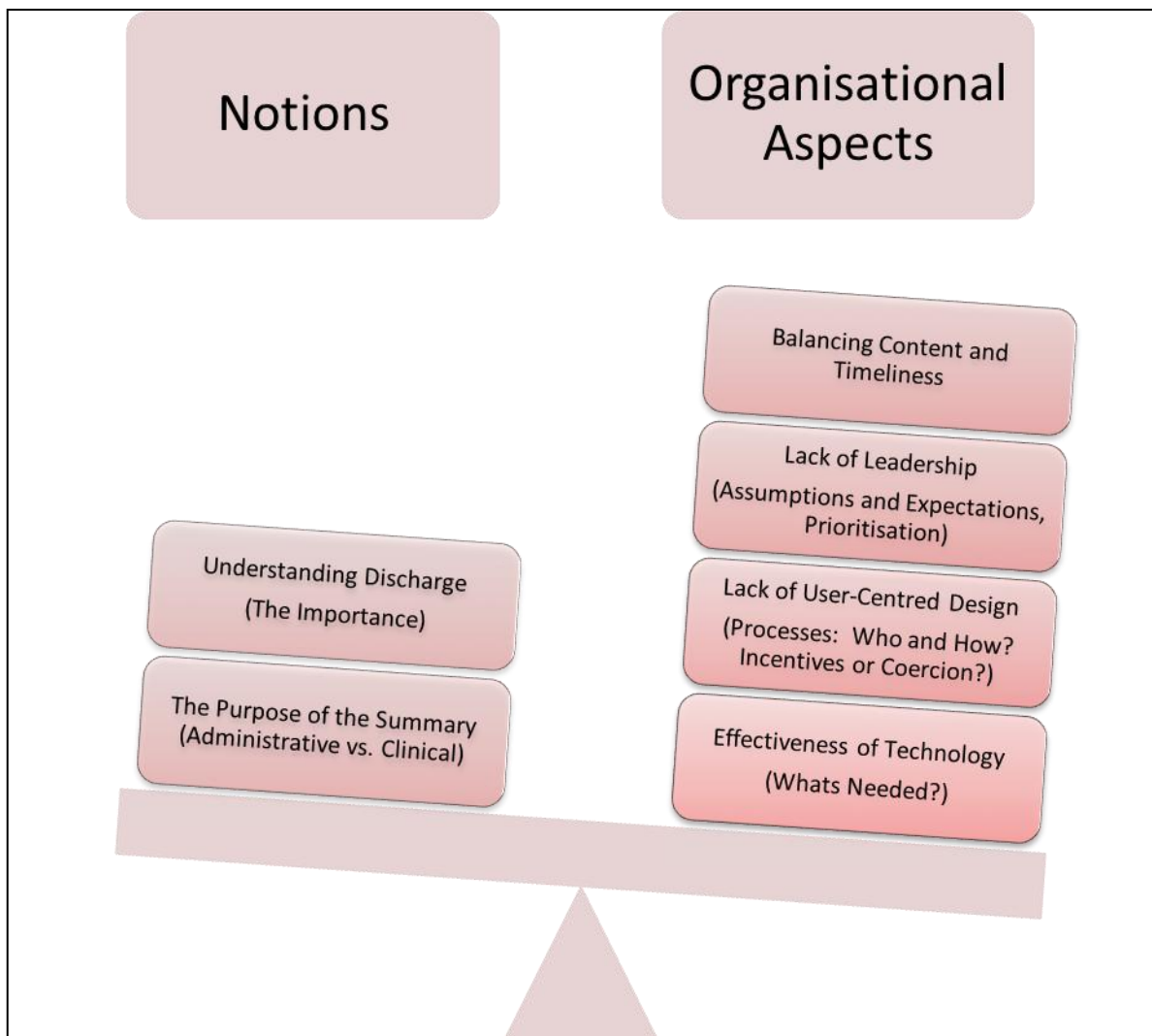
5.4. Results

There were N=20 participants in secondary care. Participants were of various medical grades and staff: consultants (N=10) and junior doctors (N=8), discharge coordinators (N=1) and information technology officers (N=1). Seven general practitioners were interviewed. There were no participants who elected to drop out or discontinue their participation in the study in either care sector. There were no repeated interviews. Interviews in secondary care were an average of 48 minutes long (minimum 21:07 minutes, maximum 1:15:47 minutes). Interviews in primary care were an average of 14.2 minutes long (minimum 9:18 minutes, maximum 21:55 minutes) (see Table 8).

From the use of the coding strategy and the categorisation of the interview data (which was a constantly evolving process) two main themes emerged as central to the issues surrounding discharge information communication from secondary to primary care: 1) conflicting notions of the purpose of the discharge summary and 2) organisational aspects of preparation and transmission of the discharge summaries (see Fig. 4).

Table 8. Participant Characteristics							
Care Sector	Code	Dept.	Grade	Date of Interview	Length of Interview	Audio-Taped	Forms Given
SC	JMHCP1	1	Consultant	18-06-2008	1 Hour	No	No
	JMHCP2	1	Consultant	10-12-2009	1 Hour	No	No
	JGHCOP	1	Consultant	30-06-2008	1 Hour	No	No
	ARHCOP	1	Junior Doctor	07-07-2008	1 Hour	No	No
	MVJR	1	Junior Doctor	25-03-2009	1 Hour	No	No
	TRJR	1	Junior Doctor	07-04-2008	1 Hour	No	No
	TGJR	1	Junior Doctor	23-04-2009	1 Hour	No	No
	GMJR	1	Junior Doctor	22-04-2008	1 Hour	No	No
	CB1	2	Consultant	15-12-2009	44:30 Minutes	Yes	Yes
	NA1	2	Junior Doctor	21-01-2010	21:07 Minutes	Yes	Yes
	RS1	2	Consultant	22-02-2011	44:01 Minutes	Yes	Yes
	AB1	1	Consultant	22-02-2011	37:48 Minutes	Yes	Yes
	JH1	T	Consultant	01-12-2009	1 Hour	No	No
	JH2	T	Consultant	07-02-2011	48:31 Minutes	Yes	Yes
	KF1	T	Information Technology Officer	02-03-2011	1:15:47 Minutes	Yes	Yes
	EW1	T	Discharge Coordinator	16-06-2008	1 Hour	No	No
	TR1	3	Consultant	23-12-2009	39:23 Minutes	Yes	Yes
	TR2	3	Consultant	14-02-2011	47:21 Minutes	Yes	Yes
	PJR	3	Junior Doctors	04-02-2010	20 Minutes	No	No
	PGR	3	Junior Doctors	10-03-2010	1:13:06 Minutes	Yes	Yes
PC	JM1	P	General Practitioner	12-10-2010	20:53 Minutes	Yes	Yes
	JR2	P	General Practitioner	13-10-2010	15:49 Minutes	Yes	Yes
	JG3	P	General Practitioner	19-10-2010	09:19 Minutes	Yes	Yes
	AG4	P	General Practitioner	19-10-2010	11:15 Minutes	Yes	Yes
	AG5	P	General Practitioner	19-10-2010	12:42 Minutes	Yes	Yes
	KH6	P	General Practitioner	19-10-2010	09:18 Minutes	Yes	Yes
	OA7	P	General Practitioner	27-10-2010	21:55 Minutes	Yes	Yes

Fig. 4. Qualitative Study Themes Graphic



5.4.1. Theme 1: Conflicting Notions of the Discharge Summary

Within this theme, several issues surrounding discharge summaries were discussed by the interviewees. There were differences found among the interviewed health care professionals in their basic understanding of the concept of discharge, the importance and purpose of the discharge summary itself, and an inability to agree on the content of the documentation. According to the health care professionals interviewed, these issues clearly had the potential to negatively affect the quality of the communication of information.

5.4.1.1. The Understanding of Hospital Discharge

-What is Discharge?

Hospital doctors and GPs viewed the concept of hospital discharge differently. Although there seemed to be a common understanding that it was the movement of a patient between health care service sectors, this was then defined alternately as transfer of patient care (for on-going conditions), sending the patient home (leaving hospital, completion of hospital treatment, release from responsibility of secondary care), sending the patient out (of hospital), and the patient coming back (to the community, thus the arrival, return and assumption of responsibility by primary care).

To hospital health care professionals, "discharge" means the transfer of responsibility and the release from the duties of the care for the patient away from the hospital i.e. the patient is now back in the remit of primary care and not the responsibility of secondary care any longer. The focus was more on the completion of care rather than the transfer of care.

To the general practitioners, discharge from hospital meant the assumption of responsibility (or re-assumption, if the definition considers the patient originating from primary care as their usual care sector and the hospital episode a short time when they are away from this- the unusual).

-The Importance of Discharge Summaries

All the health care professionals interviewed acknowledged that the discharge summary was an important document; it was "a given" that it had to be done. However there was a degree of separation in the grasp of this importance. One interviewee in secondary care stated that the backlog of discharge summaries

was due to junior doctors not completing them and that while junior doctors knew the summaries needed to be done, they did not fully comprehend the impact of non-completion.

...as the junior doctor on the ward, I'm not sure how much you see the effect of not having done it [the discharge summary]... -Interviewee at City Hospital, Consultant JH2

General practitioners see the discharge summary as important because it provides them with the information about the patient's hospital stay that they need when they see the patient for follow-up post-discharge. Without the discharge summary to hand, general practitioners struggle to obtain information. General practitioners expressed a mild frustration at the hospital for what they deemed as their dismissiveness of the importance of the discharge summary. The general practitioners found that difficult to manage and felt that it reflected negatively on their capability when faced with a patient who has recently been discharged, such as questions about their new medication.

"... you go out on a visit to see a patient and they say I've just come back from the hospital and I want my tablets and you...you have to ask "what tablets?" and then it...then you...you feel as though you're being inefficient and incompetent but you actually haven't got the information." -Interviewee in Primary Care, General Practitioner KH6

General practitioners also stated that discharge summaries were a key document in the patient record to save information that may be needed at a later date.

... [the discharge summary] helps to underpin the clinical work that you do, because it makes it more accurate and it means that the next person who sees that patient has this information...you have to try and remember that...-Interviewee in Primary Care, General Practitioner JM1

5.4.1.2. The Purpose of a Discharge Summary

-What's It For?

There were varying comments on the true purpose of the discharge document. Most commonly, the interviewee would state that the discharge summary was to inform general practice of the hospital admission episode. This was a required notification sent to general practice. However, the discharge summary was also deemed a means to provide detail on the issues arising during the admission; that may be used during team handovers intra-hospital (i.e. from the kidney dialysis team to the transplant team or the diabetes specialist team).

"...the real purpose of the discharge summary is not for the GP, all they want to know is what the medication is... [the discharge summary] is so when that person is seen in clinic, the person who is seeing them in clinic, who may not have seen them on the ward, can look through and see what happened..."-Interviewee at QMC, Consultant JMHCOP1

The discharge summary was also to record patient data to keep on file in the hospital that may be used during subsequent re-admission of the patient or for case management, as well as other administrative aspects.

"The discharge summary transfer of care letter isn't just for the patient and the GP, it's also a record I use when the patient comes back in and so the amount of detail the GP needs: came in with pneumonia, you don't need to do anything more...but came in with pneumonia and was hypoxic, unwell and had 24 hours of iontropes is stuff I would like to know when and if they come back in. So the form has multiple purposes and stuff is kept within the hospital here for use at different points."-Interviewee at QMC, Consultant JH2

Also mentioned recurrently was the belief that the discharge summary should provide details of any follow-up required for the patient that needs to be actioned by the general practice in addition to any specific instructions or recommended strategies for the continued care of this patient.

Most often mentioned was the discharge summary being the means by which information on patient medications was communicated between the hospital and general practice. Health care professionals from both sectors saw this as the greatest reason for the existence of the discharge summary and the necessity to complete the documentation. In secondary care, interviewees expressed strong opinions on primary care, their information needs and use of the discharge summary (without having consulted with them or been in their position). Some of the interviewees displayed a sense of arrogance in that respect.

"...so the GP needs their bit: what's the diagnosis, what do I need to do, but the hospital needs what happened in hospital briefly...they don't need 5 pages. No one will sit and read 5 pages (laughs)..."-Interviewee at QMC, Consultant TR2

-Administrative vs. Clinical Task

Doctors in secondary care made strong statements on their aversion to paperwork, or clerical tasks, such as discharge summaries, which they viewed as a waste of their time rather than good professional practice. One interviewee made a particularly valuable statement:

...doctors are not naturally people...I mean they don't become doctors because they like paperwork...it's probably one of the least interesting things people do, people don't particularly like doing it, I don't know if anyone really likes doing discharge summaries...it's a task that people don't really want to do, it's not essential for the care of the patient who's currently in front of you...in hospital people don't really see...-Interviewee at City Hospital, Consultant CB1

This interviewees' comment indicates that there is a tendency for doctors to justify giving discharge summaries a low priority. This is especially relevant given that this attitude was expressed by a senior health care professional.

Furthermore, while the task was being completed in hospital, as the general practitioner was one of the main users the end product was being used outside of the hospital, or within another sector. This knowledge may impact the importance secondary care health professionals place on the need to complete the discharge summary. One interviewee put it succinctly:

"...It's probably more beneficial to your recipients than it is to us really...it's taking pharmacy far longer, so it's very difficult to sell a system such as this internally when in actual fact the benefit is being felt away from the hospital." -Interviewee at City Hospital, Electronic

Some doctors, while believing in the benefits of electronic discharge, see it as an administrative task rather than a clinical one, and perceive it to be a task that can be shifted towards more junior or support staff.

"...I've never really felt like going down the road of...the doctors sort of printing...I mean doing them on Medical Office is fine, but it's the doctors having to do all the printing and filing...there is a bit of a tendency with these systems to move your doctors into admin stuff, and the doctors already have got quite a lot to do...we just have to just make sure we're not making the doctor's into typists and admin ...the admin staff are better at this. Quite a difficult balance I think..."

Interviewee at City Hospital, Consultant CB1

This showcases the dilemma that exists: the intellectual aspects of deciding what information should be included on a discharge summary must be appropriately balanced with the secretarial or administrative aspects of the generation of a physical or electronic letter and arranging for its transmission and filing. The interviewee indicates that with the new electronic system, the responsibility for the entire process falls to the writer/doctor, whereas with the previous system the doctors would dictate and move the responsibility on to the secretaries to complete. With the introduction of the electronic system, the secretarial aspects have become shifted towards the staff with the least time, inclination and training.

In primary care, general practitioners agreed that there was a difficulty in matching up the requirements for the appropriate documentation with the need to focus on patients care.

"...it is difficult to explain that administration is also important, because they [doctors] are busy, they're seeing patients, they're dealing with the clinical work...Yes of course you are, but record it as well. I'm guilty [of that] myself sometimes, so I'm not perfect..."- *Interviewee in primary care, General Practitioner, JM1*

General practitioners acknowledged that the task of completing summaries in hospital is difficult in comparison with primary care documenting patient visits, due to the environment of the workplace and facilities available.

"...we don't find it difficult to understand [clinical vs. administrative] because we sit in front of a computer screen all the time and our office is also our clinical room, whereas that's not the case in hospital..."- *Interviewee in primary care, General Practitioner JR2*

5.4.2. Theme 2- Organisational Aspects of Preparation and Transmission of Discharge Summaries

There were several issues surrounding the organisational processes used by the secondary care health care professionals for the creation and transmission of the discharge summary documentation. Within secondary care, the issue of discharge summaries is problematic due to difficulty in the prioritisation of tasks during the workday, the discontinuity due to staff rotations and increased specialisation, and the assumptions and

expectations surrounding the task under which the health care professionals in secondary care operate.

The discharge summary generation process is also at issue. There is little consensus as to who is responsible and how discharge summaries are completed. The timing of the discharge summary is a main point of discussion with the interviewees, who offer their views as to the solutions they expect would produce the most effective “fix”. These included suggestions of the coercion method or the incentivisation method. Interviewees also offered their opinions as to what needs to be done to resolve the discharge summary problem.

A main part of this theme, which overshadows the issue of the quality of discharge summary communication, is that of the effectiveness of introducing technology, the lack of leadership and user-centred design and implementation of the electronic discharge system. The interviewees were blatantly honest in providing their perspectives on the failures and successes of the uses of information technology to solve the difficulties with discharge communication.

5.4.2.1. Content vs. Timeliness: A Balancing Act?

A main point of discussion during the interviews was the delicate balance between achieving the goals of improving both the content and the timeliness of the discharge summary. One interviewee said it was difficult to get discharge summaries to be appropriate to all users at once, as the needs would vary, and the ability of the individual completing it to do so as a

priority was often compromised by other elements of the busy hospital workday.

“...The thing with the discharge summary is that unless you are going to do two discharge summaries, which no one is going to do...you’ve got to have something which straddles the two...”- *Interviewee at QMC, Consultant AB1*

- **What Do Hospital Doctors Think Needs to Be on a Discharge Summary?**

Most prominently figuring as a crucial content were medications and the details of drugs given to the patient as they were being discharged from hospital.

“...the medication bit is perhaps the jewel in the crown? Because it leaves a hospital-based audit trail of medication changes and why were they changed, something that GP’s hate us for quite rightly...did you stop it because you didn’t know that they were on it or did you stop it for some clinical reason and if so what was that reason...should I restart it, is this patient going to come to harm by not having it? Or were they coming to harm by having it...”- *Interviewee at QMC, Consultant JH2*

Respondents in secondary care were generally aware of the general practitioners opinions that the discharge summary should include basic demographic details of the patient, details of when and how they were admitted, any tests or procedures they had performed during their time in hospital, and diagnoses. The secondary care professionals also agreed that

the medications were a key element of a discharge summary, and that this should include the names of all medications being taken by the patient when they were discharged, as well as dosages and length of the course of the drug.

This was contradicted by another interviewee, who described how in their department health care professionals attempted to develop an in-house consensus of what information should be present on discharge summaries, which was much more involved and lengthy:

"...the consultants in charge put together a fantastic proforma to capture all the information, which probably went above and beyond some of those pieces of information (points to The Royal College of Physicians Standards document)...but really captured the essence and guided people in the right way." *–Interviewee at QMC, Consultant AB1*

- **What Do GP's Think Needs to be on a Discharge Summary?**

General practitioners were clear that there were basic items of information they needed on a discharge summary: demographic information, diagnosis and the medications, but that it did not necessarily need to be brief.

"It helps obviously when you have sort of a patient sitting with you that you have as much information as possible." *–Interviewee in Primary Care, General Practitioner AG4*

General practitioners expressed mild frustration with some of the information arriving from secondary care; if there were certain items missing or unclear, they would need to locate that information.

...sometimes these don't give enough information...if you want to know whether somebody has had a blood test or not...it doesn't tell you [but] you've got the basic information about the drugs only...if I have to do two phone calls, one to the admissions to find out which consultant it was and then another one, I'm actually quite short of time and that's irritating...- *Interviewee in Primary Care, General Practitioner AG5*

The worst thing of all is that you occasionally get them where there isn't a name on it, or there's a name but no date of birth and we have two patients with the same name or there isn't an address...or sometimes there isn't a consultant's name. -*Interviewee in Primary Care, General Practitioner JR2*

The general practitioners were in strong agreement with secondary care on the necessity for the medication information to be given in detail on the discharge summary. They were also insistent that the follow-up information be given its due, with more detail given as to what is expected of the general practice to act upon, and any concerns they should be aware of. This mirrors some of the earlier views from secondary care. General practitioners expressed a preference for this information in comparison to details of the tests and investigations conducted in hospital, considering that to be additional or superfluous and often not of interest to them.

-The Royal College Standards

When discussing the requirements and "Gold Standard" for discharge summaries issued by the Royal College of Physicians, health care

professionals of both sectors dismissed them as inflexible and lengthy, impractical to complete in a timely fashion in hospital and impractical to go through in a busy workday schedule. This indicates that if electronic discharge systems are to be implemented and used effectively, then the standards issued by the Royal College (if the majority of the information is not automatically populated from the hospital database) will necessitate that the discharge summary become lengthy and inflexible to the realities of the workplace.

This is contradictory to some of the previous comments made by health care professionals from both care sectors, as they had specified several items of information as crucial to be present on a discharge summary, but when faced with a list of items they backtrack and are dismissive of it as overly lengthy. It is apparent that all health care professionals concerned require a significant amount of information to be transferred, but no one wants to spend the time on the task. This leads into organisational issues surrounding the communication of discharge summaries.

-The Timeliness of Discharge Summaries

The issue of the timeliness of the discharge summary was one that the health care professionals were familiar with and had the greatest trouble with. When discussing it with the health care professionals in hospital, this tied to several aspects, some of which they felt they had little capacity to control.

An interviewee mentioned that they were required to complete it within twenty-four hours of the patient leaving the hospital, but that more often

than not, she would start the task of compiling the summary as soon as the patient was admitted by adding as much information as she had available, and then continually updating it during the patient's stay, to just leave the last few details for the final patient review prior to discharge or as soon as the patient had left. This was a useful routine to adopt. The user (SHO) had developed this routine in response to the introduction of the new system without being instructed to do so, but this is a rare case among the interviewees.

"...you need to start doing the discharge summary as soon as the patient is admitted. There's no point doing it, five minutes before they go. You should be, on the day that person comes in; you need to put in what they have been admitted with...yeah you fill in the basic bits. Then you can add to it as you go on...and then on the last day all you've got to do is put the drugs in and then it's done..."-
Interviewee at City Hospital, Senior House Officer NA1

Another said she understood the need to have the discharge summary done and sent to the general practitioner as quickly as possible, but struggled to do so when faced with a newly admitted patient who was in need of more immediate care. She said in those cases, often the recently discharged patient lost the priority, which negatively affected the timeliness of the discharge summary.

"...clearly if you've got a choice between going and sorting out a sick new admission, or sorting out somebody who's just got poorly on the ward or booking tests or whatever it happens to be, the discharge summary is going to go to the bottom of the pile, because it's not

directly applicable to the patient in front of you. I think that's the difficulty with that..."- *Interviewee at City Hospital, Consultant RS1*

In general practice, the views centred on the need to have the discharge summary to hand when following-up with the patient. If this is within a day or so of discharge from hospital, then the communication of the discharge summary and its information needs to have taken place prior to that. From the perspective of general practice, it was "never too fast" to receive a discharge summary, and there was an anticipation that the introduction of the Trust-wide electronic system would improve on the timeliness of the summaries communicated. When interviewing the general practitioners within the primary care sector, the concept of an electronic discharge summary was met with a combination of exhilaration at the prospect and scepticism of the potential to fulfil its promised benefits. When discussing the NUH Trust's plan to implement electronic discharge, one interviewee was highly sceptical of the degree in which the ability to work would be improved:

"...[if] we don't get the discharge summary until a month later because somebody hasn't done it then it's absolutely no use, but if we get an electronic discharge summary the same day or the day after then that would be ideal..."- *Interviewee in Primary Care, General Practitioner OA1*

The way by which discharge summaries were sent out of hospital and received by the general practitioner varied and was inconsistent, caused some frustration, and also affected the timeliness of the communication.

"...a lot are hand-delivered [by the patients]...it's a mix, a complete mix. You have some electronic...and I think there are one or two [departments] that send them through the post...we have some [departments] that are on electronic transmission and we get theirs electronically..."-Interviewee in primary care, General Practitioner AG5

Conversely, with other general practitioners there was an overall sense of satisfaction and approval of improvements to the timeliness of discharge summaries over the recent years, and this was attributed to the increasing standardisation used by the hospital, and for those general practitioners who utilised electronic post (or e-mail service), the transmission of the discharge summary through that medium. The general practitioners were pleased with the speed of transmission of the discharge summary information, as it assisted them in the follow-up with the patient post-discharge.

5.4.2.2. Lack of Leadership

An evident lack of leadership presented itself throughout the findings of the study. This was an overarching presence that affected many issues the health care professionals struggled with, and influence their assumptions towards the communication of discharge information on the summary, their expectations of each other, their ability and/or their willingness to give the task the necessary priority.

-Assumptions and Expectations

Health care professionals (doctors and management) approach the issue of discharge communication loaded with pre-formed ideas on discharge

summaries, expectations as to what they are able to put forward in terms of effort to complete the task and assumptions as to the information needs of the next user.

This has the potential to unwittingly impact on the quality of the communication being generated. There was widespread lack of knowledge in secondary care about primary care, and simultaneously disinterest in filling in the gaps in knowledge. This leads to presumptions and assertions by health care professionals about the other sector which may be unfounded in reality. For example, some consultants in hospital operate under the assumption that the general practitioner is not in need of much in the way of details on the patient; that they merely need to communicate information on medications for the patient.

"...any medication changes I will put in bold, because that's really all the GP wants to know... sometimes there will be stuff in the text that's quite important..."- *Interviewee at QMC, Consultant TR1*

There is an assumption, even, that general practitioners do not read the discharge summaries when they are sent or do not receive them (as there had not been a facility to confirm receipt).

"...they [hospital doctors] don't view the discharge summary as giving a bit more information, which it does. But to be honest GP's don't actually read them..."-*Interviewee at QMC, Consultant JMHCOPI*

"...I've never met a GP that's received any of my clinic letters. Ever."
- *Interviewee at QMC, Consultant TR1*

This could lead to the consultant creating the discharge summary while considering it an exercise that is not the best use of the time that they have available, and thus not affording the task the care that is required.

Interviewees commonly referred to discharge summaries as a distasteful task (this issue and the lack of interest in the topic was also inferred from the researcher's (HZ) struggle to obtain other SHO's and junior doctors to interview for the study).

"...well historically discharge summaries are something everyone hates to do.."- *Interviewee at QMC, Consultant TR1*

"... It usually falls to the most junior doctor to do it because it's a task that everyone hates..."- *Interviewee at City Hospital, Consultant CB1*

These quotes indicate a sense of unprofessionalism or departure from best practice. Also present in general practice; there was a view that the documentation was an additional level of bureaucracy that needed to be accepted.

"...you get this attitude here in this building. People will say oh why do we have to do that, it's just bureaucracy..."- *Interviewee in Primary Care, General Practitioner, JM1*

- **Prioritisation Problems**

Crystallizing from the interviews was the concept of prioritisation, as one of the problems that health care professionals struggle with regardless of their schedule, grade, and years of experience. The intense workload of the health professionals in hospital was also an area of concern. When asked where the difficulty with the discharge summaries occurred, those interviewed often placed the issue on the lack of time they have available to dedicate towards the completion of the task. Hospital schedules are often very intense, and the health care professionals feel harried and obliged to multi-task. The historically challenging issue of the discharge summary backlog is the result of the health care professional's struggle with this issue. The discharge summary is seen as a task that can wait, that can be pushed to the bottom of an ever-expanding list of things to do when on duty in the hospital.

"...you go to a new job you will find the bottom drawer filled with notes awaiting discharge summaries...there's a million and one other better things to do with your time even if it's just having a cup of tea..."-Interviewee at QMC, Consultant TR1

Several hospital doctors admitted to consciously deciding to forgo the writing or completion of a discharge summary for a patient who has just left in favour of caring for the newly admitted patient who is in need of more immediate attention.

"...They [doctors] don't do discharge summaries, because it's not the most important job for them; the care of the patient is. Or that meeting or whatever...and they become shifted; though they do get

done...it's not considered the most important job." -Interviewee at QMC, Consultant RS1

Since the influx of patients and new admissions and discharge of other patients from hospital does not cease, the backlog continues to increase, and the prioritisation and re-prioritisation cycle continues unabated. This is a clear indication of a lack of leadership on the issue of the importance of discharge summaries, where if senior or team leaders do not "lead" by example and prioritise this task and require that staff perform, this will not be resolved.

5.4.2.3. Lack of User-Centred Design

- The Process of Generating the Discharge Summary

Within the hospital, the processes of collecting the information on the patient's stay, collaborating on the task of generating the discharge summary and completing it within the expected frame of time varied from department to department, and fit loosely within the Trust defined procedure. The interviews with health care professionals in secondary care and the observations were very informative in this respect, providing a great amount of detail into the working processes and routines.

The availability and efficient utilization of resources figured prominently in the discussions with health care professionals in secondary care. The grade of the health care professional responsible for completing the information on the discharge summary is a problem, and the health care professionals interviewed vacillated between preferring a senior doctor or consultant to

compile the letter, and alternately placing the task in the hands of more junior or support staff because of the overwhelming workload of the senior staff. There is no consensus and therefore there is a lack of assumption of responsibility.

"...what happens is the [patients] that get discharge summaries done very quickly are the ones with a very quick turnover and they get a handwritten one...the problem is with the patients who are in for length of time... no one takes ownership for doing that. It usually falls to the most junior doctor to do it because it's a task that everyone hates, but at the same time there is no one actually checking that goes on..."-Interviewee at QMC, Consultant CB1

The junior doctors, who are often tasked with the completion of the discharge summary, may do so quickly, believe that as they are required to submit it to the senior house officer or consultant for review and signature, any errors or omissions will be picked up by them then, and this may cause carelessness. The same applies for doctors including only part of the medication information, knowing that a pharmacist will check it at a later stage before dispensing the medication that the patient will be taking out of the hospital.

"...the junior on duty would take a quick drug history, and even if they were unsure there is an assumption that the pharmacist on duty will pick up those errors [on the discharge summary]." -Interviewee at City Hospital, Discharge Coordinator EW1

While delegating the completion of the discharge summary to more junior staff would allow the senior doctor to attend to more pressing duties and

offer the junior an opportunity to gain experience to learn or review a medical case, in practice this has been found to be problematic -a poorly designed process- and has seen a reversal where junior doctors are not given this task or even a duplication of effort, with the senior doctor having to redo the summary or send out additional documentation.

".... but we don't want our very junior doctor's doing this...what will happen is they will do them and then send them, but within 24 hours they will be reviewed by a senior doctor who will decide and make sure that that bit...bearing in mind this will have no information versus some information, and what we want is no information versus brilliant information- and if we need to we'll send out a supplementary letter after..."-Interviewee at QMC, Consultant JMHCOPI

-Rotations and Increased Specialisation= Discontinuity

The issue of health care professional's rotations and the increased specialisation of medical care leads to a discontinuity. In the interviewees' opinions, this can make completing a discharge summary more complex.

"...the unit will have patients under 10 or 15 different teams a day...patients who come in every week for day case procedures...they don't come to our wards they come to the surgical short stay unit. They are never seen by one of our doctors, because the procedures are done by [one team] and the results are communicated by telephone and the nurses do the discharge..."- Interviewee at QMC, Consultant RS1

The junior doctors interviewed explained that due to their rotations being brief, in departments where patients may have a longer stay (e.g. nephrology) they may be tasked with writing a discharge summary for a patient they had not cared for.

In the view of primary care, the involvement of several individuals in the discharge summary is problematic, and leads to errors and discontinuity.

"... [discharge] is difficult...to me, clinical people should put the information in because they know what's in their head and they understand the clinical things, whereas as soon as you hand over to a non-...to an administrative person, unless they are very *au fait* with medical tech and terminology, they can easily make a mistake..."-
Interviewee in primary care, General Practitioner KH6

- **How Are Discharge Summaries Done?**

The Trust had conducted a mapping exercise for the discharge summary, following the patient journey through hospital, to find out the points within the typical hospital stay where information the discharge summary would begin and when information would be added to the discharge summary (Nottingham University Hospitals Trust, 2011).

The exercise aimed to identify the people involved in generating summaries, the gaps in the process that the electronic system could help overcome, and the potential to streamline and increase efficiency. This discharge mapping exercise, conducted in early 2009, resulted in the development of an expected trajectory for the discharge summary.

Within the Department of Paediatrics when using the traditional handwritten summary, the junior doctor would fill out the proforma or paper template at the point of discharge, the consultant would review and sign it, and it would be handed to the receptionist on the ward to be faxed to the general practitioner within twenty-four hours. The handwritten paper would then be filed and kept on record in the patient notes for coding and administrative purposes (see also Chapter 4 and appendix for the Paediatrics handwritten template).

"...what happened before [the handwritten form], or what was supposed to happen, is that the patient would be discharged, somebody had to then keep the notes, then go and find a Dictaphone, then they had to find a tape, then they had to find somewhere quiet to sit down and use that Dictaphone and that tape...then pass that on to the secretaries who would then do the typing...that was the rationale for the electronic discharge summaries. There were never any Dictaphones around, never any tapes, by the time you've found all of that you've lost the notes because they have gone to clinic and the discharge summaries just don't get done..."-
Interviewee at QMC, Consultant TR1

When Paediatrics introduced the electronic discharge summary, the doctor was expected to access the hospital computer database from a terminal, log in, locate the patient with their hospital file number or NHS number, create a new letter "discharge summary" and insert information into the electronic database fields, saving as they went on. This computer document could be completed at intervals, and then logged for review and signature by the

consultant in charge or attending physician (see appendix for the paediatrics electronic template).

Once this was done, a secretary would then open the file and print the summary as a hard copy letter and send it through the postal delivery service to the general practitioner. If that particular general practice surgery was using an electronic service themselves, the discharge summary could then be electronically posted (e-mailed). This was not without problems, as described by this consultant:

"...we rapidly discovered problems with that. Not so much with the system itself, but the way the [electronic] system works, you have to be registered and you have to be logged as being in the hospital, and out of hours there is no clerical support so no one gets put on the system is you can't do a discharge summary because that patient doesn't exist electronically...so immediately we had to go back to using paper summaries, because otherwise the ward was being taken over by piles and piles of notes awaiting summaries, and the main thing about summaries is that they need to be done quickly and immediately..."-Interviewee at QMC, Consultant CB1

"...no, [electronic summaries] haven't improved things. It would do if they were used. It could much improve things, but people just don't use it. It's just changed the way they aren't done. So they weren't being dictated and now they aren't being typed." - Interviewee at QMC, Consultant JH2

Both types of documents, irrespective of the method by which they were completed, did not contain information on medications as this was still -at the time the first wave of interviews were conducted in secondary care- part of the "TTO" and not on the discharge summary itself (see appendix). The system was designed without this key item in focus, despite the acknowledgement of the importance of the presence of medications information on the discharge summary, a major flaw. This is a clear indication of a system that was designed without user-consultation and that is not fit for purpose.

Within the Department for Health Care of Older People the discharge summary had been historically dictated by the doctor, transcribed and typed by a secretary, and sent by postal delivery to the general practitioner. This dictated letter was often short, containing some limited information on the patient's stay in hospital, and was mainly considered a means of notification to the general practitioner of the hospitalization. The dictated letters gave *ad hoc* information, listing information in no particular order, and were not guided.

At the time of the commencement of the research degree programme (2008), a proforma template (see appendix) had been introduced within the department to structure the content of the discharge summaries (see Chapter 4- Pre and Post Comparison Studies).

This updated the discharge summary generation process within the department, as it listed specific fields of information for the doctor to fill in or handwrite on paper, or use as a guide if they continued to dictate their summaries. The letters were then typed by secretaries and sent by postal delivery or facsimile to the general practice surgeries. At the time of the first

wave of interviews in secondary care, no discharge summaries were being sent to general practice electronically from this department (HCOP).

In the Nephrology Department, there had previously been a handwritten template in use (see appendix) which was a single sheet with basic information on the patient's stay that would be completed by a junior doctor, and handed to a secretary to be typed as a letter, signed by a consultant or senior house officer on duty, and returned to the secretary to be sent through postal delivery.

At the time of the first wave of interviews, the department had volunteered to trial the Trust electronic discharge template (see Chapter 4). This was a basic discharge summary implanted into Medical Office. The doctor would access the hospital computer database from a terminal, log in, locate the patient with their hospital file number or NHS number, create a new letter "discharge summary" and insert information into the electronic database fields, saving as they went on. This computer document could be completed at intervals, and then logged for review and signature by the consultant in charge or attending physician (see appendix for the renal electronic template). There were difficulties with this as well:

"...first of all you have to log in and this is part of the problem...it's not an automatic thing. Not everyone who uses NotIS gets the discharge summary tab. So you had to make sure everybody was told in IT as to who the new doctors were, Now our doctors change every four months or every six months, depending on what rotation they are on, and so there is this constant changeover...and a lot of the time people weren't getting the discharge summary tab added to

their list of permissions...or they were claiming they hadn't got the appropriate access. I think a lot of them didn't bother to look for it. Which is a separate issue..."-Interviewee at City Hospital, Consultant CB1

Thus the main difficulties expressed centred on the importance of the medication information and its inadvertent omission from the first implementation of the electronic system, the trouble in finding enough time to complete a summary, the access and permissions issues, the dependency on information in patient records which was not always updated or accurate, and a lack of rapid, appropriate and frequent training.

This observed process for generating the discharge summary in this department provides an example of the administrative difficulties that presented themselves with the introduction of the electronic discharge system; where the problem had been not being able to locate the Dictaphone, it was now a question of access permissions to the secure hospital system.

Once the doctor(s) had included their input, a secretary would then open the file and print the summary as a hard copy letter and send it through the postal delivery service to the general practitioner. If that particular general practice surgery was using an electronic service themselves, the discharge summary could then be electronically posted (e-mailed).

As was the case with the Department of Paediatrics both types of documents, irrespective of the method by which they were completed, did not contain information on medications as this was still -at the time the first wave of interviews were conducted in secondary care- part of the "TTO" (see appendix). The electronic system introduced without the medications section was problematic, as medications remained an additional piece of documentation. This was a basic flaw in the design of the implementation plans for the electronic system, where the end-users were not consulted appropriately of their needs when compiling or using a discharge summary¹.

"So we've linked the TTO and you can't...sign off the TTO and therefore get someone's prescription and them out of hospital until you've done the discharge summary..." -Interviewee at QMC, Consultant TR2

One interviewee put forward an opinion that the previous systems designed by the departments were doomed to fail because of the lack of robust underpinning procedures to support them:

"...I think the systems they put in HCOP and Nephrology were fundamentally flawed. All they did was put something onto a computer...there was no standard operating procedure behind that: how do you do it when you do it, what has to be on it...no compulsory fields..."-Interviewee at QMC, Consultant JH2

¹ (In the interval between the first and second wave of interviews in secondary care, this flaw with the separate medications section "TTO" had been rectified and incorporated into the electronic discharge summary. This was part of the second phase released by the Trust across all departments in 2011. Essentially, this eliminated the need to use the "green form", and unified the discharge documentation being sent to the general practitioner, which was a major improvement).

Several health care professionals offered explanations as to the reasons why such a system has failed to successfully materialize in the previous years, despite interest in its development: it was a project that was attempted without the appropriate levels of expertise and attention to detail, and was managed without necessary leadership and balance of the multiple user's needs.

"...the [electronic discharge] project just kind of died...fizzled out. People got moved from the project onto other things, and I heard nothing more about it. It's being revived this year...but one of the reasons the project folded was when they tried to pilot it in other areas they said "but this hasn't got what we need on it"...well what do you need on it? It's this perception that every doctor has that their area is more special than anyone else's. I am more special than anyone else. No one understands what I do..."-Interviewee at QMC, Consultant TR2

-Incentives or Coercion?

The views of the health care professionals interviewed on the difficulties they face with completing discharge summaries are compounded by the Trust's and PCT's timeliness targets and the process by which the discharge summaries were generated in hospital and transmitted to general practice, which resulted in some exasperation displayed by the health care professionals interviewed.

"...this 24-hour limit is making it more difficult... I tend to do them without having seen...before the notes come back, which is actually a bit of a pain... I don't know how you're supposed to produce the typed discharge summary within 24-hours because the notes take

several days to come through... it's quite difficult, this 24-hour business is quite difficult...-Interviewee at City Hospital, Consultant CB1

This target setting by the management was a measure introduced with a presupposition that staff will be able to meet the timeliness requirement, but did not fully recognise or allow for the potential compromises that would have to be made in the quality of the content included. This showed a lack of understanding of higher management of the real issues that face front-line staff on a daily basis.

Health care professionals are therefore concerned that if the focus of the electronic system is the timeliness and not the presence of content on the discharge summary, the true overall quality of the information may be seriously affected. For many of the interviewees, targets were a constant presence, looming over the conversation and impacting the way they proceed with their work. They saw the electronic discharge system as a good way to meet the required target [all discharge summaries sent to the GP within twenty-four hours of the patient being discharged], but that it may not be the ideal solution to the quality problems.

"In terms of your target, you've hit your target; you've hit your completeness, but what about quality? Because at the end of the day what are we doing this for? It's to help the patient...which is where, well we've ticked all the boxes, but have we missed the point?" – Interviewee at City Hospital, Electronic Discharge Team KF1

The Trust, as part of its plans for the implementation of the electronic discharge system, is also introducing a periodic performance report feature

for each specialty on the rate of discharge summaries completed within the target required, to incentivise staff to increase their rates of completed summaries.

"...each area will be getting a performance report against the very basic standard of...your patient came in, and did the discharge summary come in the appropriate time...electronically through NotIS...we've asked ICT as part of the development to make sure there is a performance report by specialty...and they will have that by the end of this [phase]...we've had one already but it's clunky and no one uses it...because no one is using the system properly...but once the system is rolled out [the electronic discharge summary system and the TTO system] each area will get a 98% well done...84% must do better...against 95% completeness within 24 hours...-Interviewee at QMC, Consultant JH2

One interviewee had suggested a similar approach to increasing the performance of hospital departments in completing discharge summaries on time:

"...You have to change the culture, change the mindset...so that it's not an optional extra, you HAVE to have a discharge summary...the way it worked where I was [before] they would name and shame every month, those who'd got numbers of outstanding discharge summaries, an e-mail would go round to everyone saying they have this many...and you had a three line whip and you went and you did them. And if you didn't do them the Trust didn't get paid...so there was an incentive to do it...-Interviewee at QMC, Consultant TR1

One health care professional interviewed offered his perspective on the way forward:

"...It is about a sea cultural change...it's about getting people to change the way they work, about getting people to plan better, it's about making it everybody's responsibility rather than thinking oh somebody else will do it...-Interviewee at QMC, Consultant AB1

Another consultant described her attitude succinctly towards the existing conflict between the desire to incorporate technology and the resistance by staff:

"...sometimes you just have to have the JFDI attitude: just f-ing do it. Because otherwise how...and ultimately if you just tell people this is how it is to be done they will whinge and moan for a month or two and then they will get used to it and then they will get on with it and then it will be fine...-Interviewee at QMC, Consultant TR1

These interviewees expressed these opinions on the uses of incentives and coercion with feeling; however these methods do not account for the attitudes of the health care professionals that underpin the potential success or failure of these methods. There are issues within this that overlap with those of the assumptions and expectations at play described earlier in this chapter, as the views expressed here presume that the electronic system is fit for the purpose for which it was introduced and that the failure lies with the staff who are resistant. This points again to the obvious lack of a user-centred design and implementation process for the system.

The issue of having to "sell" the system also figured prominently, it was

seen as key to the success of the implementation of the new system. If the health care professionals did not believe in, or "buy" the idea of an electronic discharge system, they would resist using it, and this would affect the compliance and the showcasing of benefits that were expected.

"...we've got a lot of juniors who now come from local hospitals that have a system who don't understand why we don't! ...and senior clinicians who say "oh I don't like this [this] sounds like it might change the way I have to work"...and junior doctors are saying "I can't believe you're operating such an outmoded system..."-
Interviewee at QMC, Consultant AB1

One interviewee was frank in his assessment of the current status of the NUH NHS Trust as far as matching other local Trusts in terms of technological advances:

"...why haven't we changed? I mean places like Kingsmill, they've had it for years and everyone there knows how to use an electronic system..."-*Interviewee at QMC, Consultant JGHCO*

5.4.2.4. The Effectiveness of Introducing Technology

-What's Needed?

The interviewees in secondary care discussed the difficulties they faced with having to compile a discharge summary, and the variety of standards or guides or lack of them to assist in the task. One interviewee supposed that there should be a "Gold Standard" for this information (but was unaware of the publication of the RCP standards). The interviewee acknowledged a need

for systematisation, and increased detail as to medication changes and their reasons.

"The problem is that patient information is not recorded in a systematic way, i.e. if a drug is changed, there must be an explanation given as to why...there must also be a coherent summary of details for the patient. I suppose there must be a department which has a working Gold Standard for such information recording, I don't know....." -Interviewee at QMC, AB1

Hospital doctors had attempted at various points to re-design the summary document, map the patient journey through their hospital stay to follow the discharge summary build-up and locate the gaps in the information handover.

"...We had a time where we followed discharge information through the system. This is to see what exactly happens, and why there is often little information passed over. There are often detrimental consequences, and nurses often spend a great deal of time trying to piece information together, from various sources. This wastes time and is inefficient. If the Care Plan contains errors, this could lead to patient or staff being placed at risk. The process is obviously flawed, but healthcare practitioners are having to make do (plugging holes when they can). -Interviewee at City Hospital, Electronic Discharge Team KF1

Another put forward what she thought was an ideal way in that the system could be designed:

"...the way I envision it would be that you would start off with the basic thing but what you would ultimately have is...templates, because an awful lot of patients come in with the same thing, so in Paediatrics most babies have got bronchiolitis, so you have a bronchiolitis standard discharge letter you click on that, you fill it, it populates the important bits, and immediately...it's about saving time.- Interviewee at QMC, Consultant TR1

In primary care, one interviewee looked at the problem with a realistic perspective and shared a view of how to proceed through increased communication and familiarity between the two care sectors:

...I'm constantly writing a note to the staff or colleagues [in secondary care] saying please try and remember to do this the next time you see a patient, because people keep forgetting and it's because we're all busy and I understand that, but it's trying to explain to people how important it is...-Interviewee in primary care, General Practitioner, JM1

An interviewee in secondary care agreed that there was difficulty in getting the electronic discharge system to succeed at NUH because there was still not enough collaborative effort with primary care.

"...it's difficult. I don't understand what a GP's job is, which is a big flaw in being able to roll this out. Also, I don't think I should have to, because there should be an equivalent of me in GP Land, doing what I am doing here, and I can e-mail that person, and I can meet him and his team...but they don't have that in GP World, so they are able to say, not for us, and then we have to go out from hospital and

convince them about this huge thing..."-Interviewee at QMC, Consultant JH1

This indicates that at present, the efforts to resolve the discharge summary communication problem lie in the hands of secondary care, when it should be a process that is a joint planning and implementation effort between the two care sectors.

The NUH Trust had pinned much of its hopes on the introduction of an electronic discharge system, and assigning task forces to design, guide and implement the project. While the concept of an electronic discharge system may be sound, it was met with much scepticism from health care professionals as well as support staff in both sectors. One interviewee claimed that the reason for the switch to electronic discharge was not altogether altruistic on the part of the Trust:

"...the whole rationale for introducing the electronic discharge summaries was to reduce the amount of time the secretaries were doing because the Trust was looking to save large amounts of money by getting rid of lots of secretaries...so if the secretaries didn't have to do this..."-Interviewee at QMC, Consultant TR1

The design and formatting of the system was complicated to accomplish, and was affected by various orbiting issues such as overarching NHS policies, policies from within the Trust itself and pressure from the Primary Care Trust to meet certain obligations that had been agreed upon.

"we thought about [the content] when we were asked to develop the

current system...we were asked to look at the [RCP]...headings...and that's why I know about that. And also the prescribing contract as well...because it's like you say you get your targets very generic...and your guidelines which again, have to be generic...but like you say you're dealing with patients, conflicting priorities... (sighs)..." - *Interviewee at City Hospital, Electronic Discharge Team KF1*

Most health care professionals and hospital staff were in favour of an electronic discharge summary and the use of electronic methods to conduct their daily tasks and believe in the benefits of modernizing discharge summary generation methods and in the new electronic discharge system being introduced by the Trust. However this enthusiasm was limited by the obstacles they faced when attempting to use the system. This was exemplified by the difficulties of locating the appropriate hardware (computer terminal), or the time spent waiting for other collaborating health care professionals to submit their input to the system. Also mentioned was the issue of the health care professional having to login to the system multiple times, which can be a hassle during a busy hospital workday schedule.

"...One of the big challenges [doctors] are finding with the system the way we've been asked to develop it, is that they have to write the discharge summary before they put the TTO through...the big bonus of this is that we're asking the doctors to do the discharge summary and the TTO in one fell swoop...which means one visit to the system for the doctor...one login and their job is done. We don't have to go back to the doctor's to say will you now do this please, because that's the thing, that's the carrot really; to get your TTO done." -

Interviewee at City Hospital, Electronic Discharge Team KF1

These potential benefits and the effectiveness of the electronic system are also mitigated by the clear negative impact on the time it takes for the doctor to create the discharge summary and for it to complete the cycle of generation and from that to be sent out of hospital and to the general practitioner, even if the time taken to transmit summaries is shortened.

"...Yes it is slowing people down...but...are you getting better information...it's probably more beneficial to your recipients than it is to us really...it's taking pharmacy far longer, so it's very difficult to sell a system such as this internally when in actual fact the benefit is being felt away from the hospital." *-Interviewee at City Hospital, Electronic Discharge Team KF1*

The electronic discharge team did predict problems to arise in this process while the health care professionals were adjusting to the introduction of the new system.

"...The problem with that is it's now taking the doctors longer to do the whole thing, because either, if the patient was in for more than one day, you could say, well, plan better, make sure you start this [as soon as the patient comes in]. Which is perfect and that's the way to do it really. It is more than one login yeah, you're right. But you've done it incrementally. You've captured information, as you've known it...you're building up so you're not creating this backlog right at the very end. But that only works if you have an admission over a few days." *-Interviewee at City Hospital, Electronic Discharge Team*

"... [combining the discharge summary with the TTO] is going to put pressure onto the system, and is going to lead to other quality issues. Such as who does them and are they done comprehensively..."- Interviewee at QMC, Consultant JH2

"...this is the system that is going to be introduced, and it will cause problems. But in places where the previous iteration of it without the TTO has allowed people to customize a Word document...[now] the first step is going to be destroying some people's very efficient systems..." -Interviewee at QMC, Consultant JH2

With the introduction of the electronic discharge system, the steps involved in the generation of the discharge summary have increased. This adds pressure to an already intense workload, and increases dependence on technological hardware and software to complete routine tasks.

"...It's taking the doctors longer to do the entire thing, which means those get sent to pharmacy later in the day, which then creates delays in pharmacy. So that's...in one way it's great, in another it's not so great, and then you have to wonder as well, if you're doing your discharge summary at this stage (points to one end of the desk) and all of the information you need isn't known until this stage (puts her hand farther down the desk edge) or even after the patient's been, then really have you got the best quality information you could have had? You've got your timeliness, you've got your data item, but

have you really got that quality piece of information...?" –*Interviewee at City Hospital, Electronic Discharge Team KF1*

5.5. Discussion

The discharge summary and its communication was problematic to all of the health care practitioners that were interviewed throughout the course of the research study.

5.5.1. Summary of Main Results

This qualitative research revolved around two main themes: the conflicting notions of the discharge summary and organisational issues surrounding the creation and transmission of discharge summary communication.

Respondents had differing emphases about the discharge processes with some hospital doctors more interested in enabling further secondary care than a transfer of care. Many showed lack of understanding of what GPs needed in transfer of care (which was exemplary of the primary secondary divide), but all interviewees agreed that the discharge summary should necessarily be quick and include medication information as a priority.

Hospital doctors accepted that discharge summaries were important, but often implied that it was not a sufficiently high priority to be done well.

The electronic discharge system introduced was often found not fit for purpose, and had the effect of transferring certain aspects of the task that were previously secretarial to doctors who were already short of time, impacting the timeliness of the communication negatively.

Within the settings, there was a clear lack of leadership and organisation, as the electronic discharge system was implemented without the element of medication information included from the outset, an indication of ineffective planning and poor prioritisation. If there were efficient leadership and a design and implementation process that was more user-centred, the issues found in this study would have been managed more effectively from the design phases.

In theory the concept of introducing IT into a hospital to improve workflow and communication with other care sectors is sound; however the success of such an endeavour depends crucially on understanding the process as seen from the user's perspectives (i.e. the health care professionals) and resolving their issues or difficulties with it. The method used by health care or hospital management of introducing targets to encourage (or push) for tasks such as discharge summaries to be completed may be more useful if there were more ownership and control given to the users themselves. Ideally, if the users had the option of more time in which to complete the task, did not need to prioritise acute care, were able to obtain better information which to include, or had easier access to the materials they needed, then the idea of target setting would become more effective. As it stands, targets act as more of a hindrance to quality (tipping the balance in favour of timeliness over content).

Although the impact of the introduction of technology is certainly evident in the interviewees' responses, the presence of IT in a health professional's workplace and the requirement to use the facilities causes conflict. The information technology experts are not necessarily medically trained but are working on designing and implementing health care systems information

technology, and are thus defining how and when doctors do parts of their work, in order to accommodate the demands of the system. An example of that would be the interviewee who described not being able to log a patient overnight because of restrictions with the electronic system, or not being assigned the appropriate log on credentials or screen tabs and permissions. This is a clear example of the failure of the organisation to implement best practice, which would be a more user-centred, iterative consultation and discussion to arrive at a shared understanding prior to the design and implementation of the new system.

The attitudes of the health care professionals and the way they view discharge summaries is problematic. The statement made by CB1 as to the aversion to paperwork and the belief that doctors were not meant to do such clerical tasks showcases the attitudes of the health care professionals towards the task and indicates that such attitudes are difficult to change, and the introduction of technology in the form of electronic discharge will do little to change that.

Also, it is apparent that while some elements of discharge communication have improved, others have remained unaltered, or were working well and had been negatively affected by changes introduced. If the doctors had not had the time to find a Dictaphone to create a summary, the introduction of a computer system will not change the fact that there is no time in the workday to look for a computer terminal and complete the task. Similarly, if the doctors had been averse to doing discharge summaries, then the provision of IT may not increase their desire to do so. If the lack of technology was not the problem, then it is an inappropriate solution.

The differences in opinion as to what information or items of content are to be included on discharge summaries is an important issue that continually manifested itself. Secondary care are of the strong belief that general practitioners do not read discharge summaries, and that therefore the discharge summary task is a misuse of their time. Secondary care health care professionals also believe that if and when general practitioners read summaries, they refuse to read long ones, or that they are only interested in medications not investigations and details of the patient stay. However when comparing these statements to those of the general practitioners, this was not the case.

The interviews offered a truthful look at how some health professionals see the way forward. The point that an interviewee brought forward on the mechanisms the NHS Trust and departmental management should use: the "JFDI" method, is a particularly strong statement, exhibiting this individuals frustration with the current stop and go plans and their sluggish implementation, as well as an opinion of the attitudes of other health care staff who are resistant. However this suggestion exemplifies poor management skills as it is short-sighted, and does not attempt to rectify the real underlying difficulties. These methods could produce results where there is an attitudinal issue with staff, but it is more effective to study the reasons for the attitude problems and solve them.

The conflicting definitions and understanding of the discharge summary can be attributed to what is known as the primary secondary care divide. The implications of this divide and the isolation it causes necessitates that both parties must make a sincere effort to joint involvement in specifying the requirements for each function of the discharge summary document and of

the communication of the information contained therein. From this, both care sectors must keep this awareness when using the discharge summary (creating, transmitting, and utilizing it for care of the patient); they must specify clearly the requirements for each function (i.e. the summary of the patient's care as well as the transfer of that care).

If the discharge summary document is recognized as a crucial document that provides information on the care of the patient, appropriate staff and resources would be channelled towards its fulfilment. The correct grade of health care professional would be assigned to complete it in hospital (i.e. not too senior a consultant to complete a simple discharge summary, but not too junior and inexperienced a doctor to complete a complex multi-disciplinary discharge). The correct level of administrative support and technical requirements would then be allocated as well. This would all be guided by clear parameters and expectations.

The issue of leadership, management and training would become clearer and more defined as the purpose of the document and the role of the person completing it crystallized.

The findings indicate some inconsistency in secondary care. The quality of the discharge summary is dependent to a large extent on whether senior leadership or management indicate clear importance and priority. The handling of the matter is left to individual teams, and the professionals are given the flexibility to establish their own routines, which leads to standards varying between teams and departments.

As it stands, the lower grades of junior doctors and the issue of their training and inexperience forms a ready excuse that health care professionals frequently lean on to place the inability of the discharge summary to achieve what it should achieve. While in some respects it is a valid concern, the responsibility must also be shouldered by the more senior health care professionals who- as described by one interviewee- dislike administrative tasks such as this. To counter this, higher management in the Trust increasingly requires adherence to centrally audited targets and standards, to reflect their priorities. Clarity of the role of the discharge summary, its purpose and the supporting processes will serve well in these respects. Robust standard operating procedures for the discharge summary generation process would then be continuously monitored by the health care organizations involved (i.e. both secondary and primary care sectors), and adapted to the needs of the specific health care specialty. There is evidence in the interviews that the organisation has not yet put in place the resources and processes required to fulfil these roles and prevent the confusion and problems .

In secondary care, the health care professionals were optimistic and believed that over time, as the electronic system becomes more ingrained into practice, the hardware issues will be resolved with the increase in the number of available terminals in the departments, and the functionality improves. The training of staff will have become routine and health care professionals will have adjusted their workplace mechanisms and attitudes to achieve the desired results. Generally, general practitioners agreed that discharge summaries have seen some improvement in recent years in terms of the speed within which they arrived at the surgery and also in terms of the information that the discharge letters contain. This is a positive response

to the efforts being made by secondary care to attain a higher standard of quality of communication.

5.5.2. Strengths and Limitations of the Study

The research study had its weaknesses, mainly in that the researcher (HZ) as a single analyst had not previously conducted qualitative research of this scale. As well as conducting this research as a single individual researcher (i.e. not as part of a full research team), the researcher was limited in the capacity to interview a larger sample of participants in the three departments selected, which may have affected the results generalisability than if there were additional departments included.

The researcher (HZ) also did not return interview transcripts to participants for confirmation and checking, and to date has not reported the study findings to the participants who requested an update (this will be resolved post-publication).

Another weakness was that the study was conducted as a single case study in a setting that had only just begun to implement electronic discharge and therefore had little experience in the design, implementation and use of such technology as opposed to the conduct of a multi-site study with health care professionals who had been using a system for a length of time.

5.5.3. Link to Current Knowledge

"The problem of generating complete and timely discharge summaries is the bane of every physician, house officer and medical record administrator"- Smith and Holzman, 1989.

Smith and Holzman attribute this difficulty to human nature, and cite frustration to be common among record keeping personnel and physician-users who are unenthused, and assert that in most cases, threatening letters (or targets) are not enough to ensure timeliness and completeness of documentation (ibid). This is supported by the findings of this current study, where interviewees are resentful and frustrated by the targets imposed on them, and express distaste for the discharge summary completion task.

The interviews brought forward the difficulties in matching the understandings of the health care professionals in the respective sectors of the purpose of the document. There had previously been research published by Balaban et al, 2007; and Branger et al, 1992 that had discussed this primary secondary divide and the disconnection that exists between the care sectors (Preen et al, 2005).

The study findings support current knowledge and published research on the importance of including users in the development of large scale information technology projects (Nace et al, 2006; Linder et al, 2007; Sequist et al, 2007; Sheikh et al, 2011) and the necessity of clear leadership to support and ensure the success of such transitions.

The interview findings depict the difficulties in the day-to-day workload, irrespective of the presence of an electronic system. This was previously documented by Adams et al, 1993; Llewelyn et al, 1988; who discussed the

potential to waste staff time with duplication of effort, repetition and other inadvertent delays due to inefficient organisational processes in completing discharge documentation.

As well, the issue of training of all health care professionals, and specifically junior doctors and increasing the awareness of the importance of the discharge summary and how to complete it had been documented by Archbold et al, 1998; Frain et al, 1996 and Flyer et al, 1988; Myers et al, 2006.

The variations in the processing methods and routines adopted by the individual interviewees and the larger departments are exemplary of the typical hospital environment as described in much of the current literature (Bergkvist et al, 2009, Dunn and Markoff, 2009; Macaulay et al, 1996; Closs, 1996; Frain et al, 1996; Solomon et al, 1995).

5.5.4. Relevance to the Topic Area

The data gathered in this qualitative interview study is of importance to the topic area of discharge communication from secondary to primary care in light of the insight it offers on the perspectives of the health care professionals from both care sectors that use this form of communication on a daily basis. The interviews offered an opportunity to disclose and verbalise many of the complexities health care professionals are faced with in their typical workdays, and to describe the difficulties they face with having to complete the task of preparing a discharge summary for a patient, the resources they have available and the perceived barriers and success they have in managing to accustom to the constantly evolving technological systems they must use.

The research contained in this chapter served to unpick some of the issues facing the introduction of new electronic discharge systems in hospital and the efficiency by which they communicate with the primary care sector, informing future iterations of these systems and the methods of implementation in hospitals such as the one showcased in the research study.

This interview study was highly informative, reinforcing the overall research interest and concern into the introduction of electronic methods of discharge communication from secondary to primary care. Obtaining the views of the health care professionals from both care sectors served to exhibit the conflicting notions of the purpose of the discharge summary between senders and recipients, such as the definitions of discharge, and the understanding of the purpose of the discharge summary documentation and communication.

5.6. Chapter Summary

The interviews provided an opportunity to delve into the issues surrounding the organisational processes for preparation and transmission of summaries and their relationship to the process they are intended to achieve, such as the current problems with generating and communicating discharge summaries, the delicate balance between the timing and content of the discharge summaries, and the proposed solutions to these complex issues as perceived by the various health care professionals, as well as the potential for the electronic discharge summary to resolve these issues. If there is clear and dynamic leadership to increase the recognition of the importance of discharge summaries, the design, implementation and use of the

electronic system would become a transition that all health care professionals involved would support and adhere to successfully. Increased staffing resources could be then dedicated towards it such as a higher seniority of staff, added administrative support, guidance and training, with clear expectations delineated. Finally these processes would be monitored by the organisation, with regular performance reports of adherence and success rates.

Chapter 6- Discussion and Conclusions

6.1 Brief Summary of the Research Project

The research project aimed to learn from the experience of the Nottingham University Hospitals Trusts' attempt at moving from traditional processes of creating and transmitting discharge information and documentation to more structured and technologically advanced electronic methods of communicating discharge information and understand the barriers to achieving the expected quality gains.

To achieve this aim, three studies were designed to meet the following defined objectives: a systematic review of literature, a series of before and after hospital studies of different types of discharge summary documentation, and a qualitative study with key stakeholders from both secondary and primary care.

The systematic review of literature helped to achieve the first objective; which was to identify and assess the effectiveness of interventions that aimed to improve discharge information communication. The before and after comparison study series was designed to achieve the second objective; which was to gauge differences in completeness and timeliness of discharge summary information before and after changes were introduced in discharge summary processing methods. The qualitative study was designed to help achieve the third objective of the research project; which was to obtain the perspectives of secondary care on current discharge communication issues, identifying points of weakness or areas of concern from their perspective, and assess primary care views on discharge information communicated from hospital.

6.2. Main Findings

The three research studies provided mixed results. The systematic review returned 21 interventions with emphasis on the introduction of computerised systems to improve quality (timeliness and completeness of discharge summaries). Nine studies significantly improved discharge summary communication in terms of completeness (Eden et al, 2008; O'Leary et al, 2009; Olsen and Adamek, 1995; Couper and Henbest; 1996; De Clifford et al, 2009; Mant et al, 2002; Rao et al, 2005; and Paquette-Lamontagne et al, 2001, Van Walraven et al, 1999). As for timeliness, ten studies significantly increased the speed of the generation of the document and the transfer of information (Balaban et al, 2007; Branger et al, 1992; Curran et al, 1992; De Clifford et al, 2009; O'Leary et al, 2009; Preen et al, 2005; Sands and Safran, 1994; Smith and Holzman, 1989, and Van Walraven et al, 1999; Wood and Campbell, 2009).

The before and after study in HCOP found no significant difference in the proportion of summaries being completed or in the number of items of information present on the discharge summaries before and after the introduction of a standardised template. This study did not collect data on timeliness. The high rate of missing discharge summaries was not improved. In Nephrology, there was no significant difference in the proportions of summaries being completed or in the number of items of information present on the discharge summary before and after the introduction of the electronic discharge summary. Significant improvement with the electronic summaries was found only for information on medication changes and recommendations. As for timeliness, the electronic discharge summaries were significantly more rapidly completed and sent to primary care: most

(32%) were completed pre-discharge, reduced from a median of 4 days in the handwritten set, $p < 0.001$).

In Paediatrics, there was no significant difference in the proportion of summaries being completed before and after the introduction of the electronic discharge summary. In terms of content, there was a significant improvement in the number of items of information present on the electronic discharge summaries (mean 27% in handwritten set, 36% in electronic set, $p = 0.00$).

As for timeliness, the introduction of the electronic summary negatively affected the speed within which summaries were completed and sent out; this was significant. The handwritten summaries were more likely to be done sooner than the electronic summaries (median 2 days vs. 27 days for the electronic summaries, $p < 0.001$). 84% of electronic summaries took over 7 days to be completed, while most of the handwritten (38%) were sent within 1 week. Though the electronic summaries in Paediatrics were significantly slower, they were more likely to contain required content, specifically medication recommendations and this was statistically significant. This indicates that the changes introduced in this department impacted positively on content (completeness) but negatively on timeliness.

The interview study also provided valuable insight into this complex area. The study found differences in the understanding of the concept of discharge, the purpose and importance of the discharge summary, and difficulties in achieving an appropriate balance between the content and the timeliness within which the discharge summary was to be completed and transmitted to primary care.

A lack of clear clinical leadership was evident and affected many aspects of the health care professional's views on discharge summary communication, their assumptions of the importance of the discharge summaries, the need to prioritise and achieve the completion of the task diligently and without delay, and their expectations of each other. There were problems with the electronic discharge system that was introduced in the available resources, permissions, access and time required all of which indicate the lack of a user-centred design and implementation process.

6.3. Strengths and Limitations of the Research Project

The research design and plan for the conduct of the PhD research project, was the result of many discussions between the researcher (HZ) and her university supervisors (TA) and (JG) over the course of the research degree programme. As is the case with doctoral research projects, there were many changes and iterations as plans for research were consistently updated and refined, to reflect the growing understanding and comprehension of the real complexities of conducting research in the health care environments.

A strength in this research project is the certainty garnered from basing the actual hospital and primary care research on the systematised review of literature conducted at the outset. This provided a solid foundation to the understanding and comprehension of the study topic and offered the researcher the reassurance that the methods and samples sizes used in her research were comparable to those observed in current and previous published literature.

Also viewed as a strength in the conduct of the research project overall is the experience of the researcher in project management from previous work experience. One of the key elements to the success of a doctoral degree programme is the ability of the student to manage volumes of data and maintain a structure for the progress of the research, the data collection, accumulation and synthesis, as well as monitor the timely progression of the multiple parts of the research in keeping with various deadlines and dates. This included but was not limited to managing the combined pressures of satisfying requirements from academic supervisors, the school, the university and the financial sponsor, as well as maintaining appropriate status as a full time international student which is required by the United Kingdom.

A strength of the research project was the project management strategy; clearly recording and in detail the fieldwork and data collection process as well as the procedures for data analysis, working to maintain their direct relevance to the research questions.

As for the weaknesses seen in the research project, one of the most obvious was that this project was the researcher's first foray into the world of formal health care research, and this led to some uncertainty at the outset, and some time misused at the start of the research degree programme.

This research project was conducted as the electronic discharge system was in its early implementation phases at the NUH Trust. As discussed, part of the limitations was the potential to gather a much larger sample or even to approach additional hospital departments and general practices, as well as the potential confounding of the obtained results by the actual timing of the

conduct of the research (when the system was still on relatively insecure ground).

6.4. Relating the Research Findings to Current Knowledge

The research findings show that there is potential to improve on the quality of discharge summaries in terms of the completeness and timeliness, but that this is variable and indicative of a need to balance both elements, and to an extent is also dependent on the health care professional and their teams, regardless of the processes in place.

The literature reviewed supports the introduction and use of standardisation and computerisation to improve content on discharge summaries; several studies returned successful results (Eden et al, 2008; O'Leary et al, 2009; Olsen and Adamek, 1995; Couper and Henbest; 1996; De Clifford et al, 2009; Mant et al, 2002; Rao et al, 2005; and Paquette-Lamontagne et al, 2001, Van Walraven et al, 1999). A few studies assessed showed no significant effects on the improvement of completeness (Crosswhite et al, 1997; Vira et al, 2006; Sandler et al, 1989) - however as discussed in Chapter 3, this could be due to the study size, or the absence of pre-intervention data. None of the studies assessed returned negative results after the interventions.

In terms of timeliness several studies also found significant improvements (Balaban et al, 2007; Branger et al, 1992; Curran et al, 1992; De Clifford et al, 2009; O'Leary et al, 2009; Preen et al, 2005; Sands and Safran, 1994; Smith and Holzman, 1989; Van Walraven et al, 199 and Wood and Campbell, 2009). One study returned no significance in terms of timeliness (Olsen and Adamek, 1995); again this may be due to the absence of statistical analysis for the study findings.

From this, the before and after studies conducted in the three hospital departments have shown that technology does not necessarily improve content; the study in HCOP found no significant differences in summaries being completed or in the amount of content. In Nephrology similarly, the number of summaries completed did not change (in this study it remained as it was – 100%). The amount of content did not improve overall, significant improvement was found only in medication changes and recommendations. In Paediatrics, the number of summaries being completed did not improve, however a significant difference was seen in the amount of content after the introduction of the electronic discharge summary (27% handwritten improved to 36% electronic, $p<0.001$).

As for timeliness, the results were variable: in some instances the introduction of the electronic discharge system has actually hindered it (in Paediatrics the timeliness was significantly affected, the median was 27 days with the electronic system where it had been 2 days with the handwritten method, $p<0.001$), but in Nephrology the timeliness improved significantly (the median was reduced from 4 days to 0 days, $p<0.001$). The pilot study did not collect timeliness data.

The interviews elaborated on these aspects this yet further. There were differences in perspectives beginning with the basic understanding of the concept of discharge, and in viewing the discharge summary document as used for cross-purposes, according to whether it was considered a clinical document or one with administrative details. There were also issues with *ad hoc* processes which were wholly dependent on the health care professional and the department in question and issues with under-training of staff in the use of the new systems, which affected the ability to produce both complete

and timely discharge summaries. These all indicate inadequate organisational preparation, a lack of leadership and user-centred design - indicating a low priority. This implies that many of the potential benefits of such modernisation efforts may not be achieved successfully and effectively.

These findings are supported by previous literature, as the introduction of electronic systems into the discharge process without compromising one element over another (timeliness vs. completeness) was most successfully documented by O'Leary et al (2009) and Van Walraven (1999). The studies posit that the most effective system is one that would generate a discharge summary by gathering data from the electronic patient record that can be added to by the health care professional as needed (flexible) and provides specific guidance as to medications, completed as the patient is leaving the hospital and sent at that time.

The training of staff was also considered an important element of success in several studies. Couper and Henbest (1996) stated that at the time of the study that no medical school had been as yet known to teach the "art of letter writing" to students, although the link between the quality of the letter and the quality of patient care had begun to be established. The intervention by Crosswhite et al (1997) included the targeted training of the health care professionals in the use of a new multi-disciplinary automated discharge summary system. Dedhia et al (2009) stipulated the necessity of training staff on the use of the discharge system. This intervention found that with training, staff found summaries easier to generate, their uncertainty was alleviated and the brevity and comprehensiveness of the document improved (Dedhia et al, 2009).

The mixed results from the before and after studies provide interesting pause, as the handwritten template in Paediatrics was significantly faster in compilation and transmission (see appendix (B-5-i)); this single page was completed instantly and faxed on the ward as the patient was leaving, however when the electronic system was introduced the discharge summary became two pages in length, had more detail in the medications section and required a computer terminal to be accessed so the information could be added. Although the handwritten template does not offer details on medication, when considered contextually it is perhaps more appropriate to Paediatric routine admissions which are often not prescribed medication.

The interviews draw out the tensions that exist in this area, there is an interest in providing more detail and content on discharge summaries but this is limited by several factors (e.g. workload, priority, targets). It is important to be able to achieve improvement in the quality of discharge summaries targeting both elements (completeness and timeliness) simultaneously. Success will come from having a discharge summary that is electronic, automatically populated with as much data as possible from the record to minimise the information that is needed to be included by the health care professional (to reduce the time needed to compile it) leaving only the final information on discharge medication to be added at the point of the patient leaving the hospital, and transmitting it at that time. Alternatives will revert the discharge summary to its previous shortcomings and set up the electronic system to fail to achieve its aims.

6.5. Implications and Recommendations for Policy and Practice

Technology in healthcare is developing as part of a larger move – albeit stifled by the recent governmental shifts - in the UK towards a universal electronic patient record and data system “SPINE” (Connecting for Health, 2011) which might enable more efficient working practices such as real time results of investigations, avoidance of duplication, moving towards protocol driven care, avoiding waste of time, duplication or hazards and errors, communication between sectors or specialities, large databases for service development, and costing or resource allocation, etc...

Recently, the national programme for IT in the NHS has been halted (Department of Health, 2010). Although in part due to changing governmental priorities, it is also due to the fact that there were design and implementation planning flaws in the programme, which made it vulnerable (Sheikh et al, 2011). The research findings corroborate this.

The concept and effort behind the research and development of clinical record standards to be used universally across the NHS in England is one that is laudable, however not as straightforward as it might seem at the outset. Health care organisations are incredibly complex systems with an infinite array of patients, medical conditions, situations, circumstances, involved health care professionals and medical specialisations, and although valiant attempts are being made at various levels of the health service, it became clear as the research progressed that there is no single solution or “one size fits all” to this conundrum.

It was important to explore the topic of hospital discharge summary communication in depth, as the issues uncovered by the research at the NUH Trust are relevant and applicable to other similar healthcare

organisation, and the insights gained from the before and after studies, interviews and observations on the problems and potential for improvement are valuable.

In continuing the implementation of the e-discharge system, consideration must be given to the issues arising within the research detailed in this thesis. The findings of the studies lead to questions about whether there is any real consensus on what should be on a discharge summary, or agreement by health care professionals (users) on the principle of "short term loss, long term gain" on the ground. This has implications for building and implementing electronic systems since they may remain problematic until a real consensus can be reached.

The way forward from this would be to:

- Communicate with the health care professionals who use the system and who have the most insight into its continued development. The issues represented in this research are present and valid, but appear to be unable to filter towards the planning committees and taskforces. It is crucial to be able to fit the electronic system to the way health care professionals work (Sheikh et al, 2011).
- NHS Trusts must be willing to explore current knowledge and published research on implementation of electronic hospital discharge systems, outside of their experiences and use this knowledge to enhance the quality of the electronic discharge process and the care of the patient.

The lessons learned by studying the efforts of the NUH to modernise discharge communication are indeed generalisable and of interest to organisations considering embarking on a similar modernisation journey.

6.6. Areas for Future Research

The issues arising from the research with regards to the continued difficulties between secondary and primary care health care professionals in discharge communication necessitate further inquiry.

Discharge communication is believed to be important, but there is minimal hard evidence that it improves safety. The link between the quality of the discharge communication and patient safety must be explored in more depth and more definitively established, in order to increase the profile of the issue, the awareness of health care organisations and professionals and justify higher prioritisation. This can perhaps be achieved through the conduct of a longitudinal cohort study, following discharge documentation from the decision to discharge to the patient leaving the hospital, and through to the general practitioner for follow-up, and assess patient outcomes at intervals. The potential for the electronic system to improve patient safety will rely in the first respect on increasing the number of discharge summaries that are completed, and improving the proportion of and speed within which they reach the GP. It is crucial to establish the reasons why, at present, many are not.

Increased collaboration between the two care sectors, perhaps with the conduct of a regular series of meetings or conferences locally or the nomination of a committee with members given authority to speak and decide for each sector, may be a way to resolve this conflict. The issue of medical specialisation, content and minimum dataset requirements can also be addressed in that format more effectively.

The technical issues and concerns regarding the lack of user-centred design and implementation of the electronic system can also be further addressed,

and research can be conducted specifically into the needs of the hospital departments and the health care professionals, and appropriate resolution may then be achieved. More detailed implementation studies are needed to examine the true resource requirements (such as training, changes to job descriptions, secretarial support, hardware support, staff time requirements and allocation for the implementation activities – timetables – and organisational requirements (committees, process, incentives and/or sanctions).

The issues surrounding the training of staff in the use of the electronic system and on the completion of discharge summaries is a particular avenue for further research. Additional knowledge is needed on the appropriate type or format or duration or periodicity of staff IT training, and this can also specifically address the needs of junior doctors.

In order to truly be able to gauge improvements, additional data on discharge communications should be collected a further year or two in the future, when health care professionals and other support staff have reasonably adjusted to the “newness” of the electronic system and the difficulties expressed have been treated appropriately. The “Hawthorne effect” will have dissipated and the process of creating and transmitting discharge summaries will have adjusted to the introduced changes.

This would be of use to the Nottingham University Hospitals Trust and hospital management, to continue to assess the success of the introduction of technology and perhaps then attempt to link these assessments to the quality of patient care and patient safety standards that they are striving to achieve.

6.7. Final Conclusions

The elements of the research conducted showed that there is potential for electronic systems to improve the quality of discharge communication; however there are several issues that mitigate the effectiveness of the introduction of these processes. The literature reviewed indicates a proliferation of research efforts into this area, some with marked success. The mixed results of the before and after studies indicate that there is a delicate balance that needs to be cautiously managed in order to achieve optimal quality in terms of timeliness and completeness of discharge summaries, and the interviews proved that health care professionals are intrigued by the potential of electronic systems to solve the problem but remain sceptical of the immediate benefits it promises to achieve, and unable to fully maximise this potential due to lack of clear clinical and organisational leadership and a lack of an integrated, user-centred approach to introducing these systems.

In order for electronic systems to be able to realise the potential benefits and succeed in improving discharge communication quality, a sustained increase in clear local clinical leadership is necessary, along with increased involvement of both primary and secondary care staff (users) in the design and implementation of a system that is flexible to local needs, prioritisation and recognition of resource requirements and organisational learning needs.

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Appendices

A) Literature Review Documentation

1) Database Search Results Tables

HMIC Search Jan 2 2010				
Search Term	Hits	Titles Searched	Abstracts Assessed	Selected
Single Term				
Discharge	2410	0	0	0
Communication	8238	0	0	0
Electronic	2060	0	0	0
Hospital	26610	0	0	0
General Practice	7566	0	0	0
Safety	10089	0	0	0
Patient	36482	0	0	0
Process	9811	0	0	0
Information	46733	0	0	0
Complete	1544	0	0	0
Quality	22917	0	0	0
Combined Terms (using OR)				
Setting (Hospital OR GP)	33360	0	0	0
Intervention (Discharge, Communication, Electronic, Process, Information)	60587	0	0	0
Outcome (Safety, Complete, Quality)	33352	0	0	0
Patient	36482	0	0	0
Combined Terms (Using AND)				
Setting AND Interventions	11500	0	0	0
Setting AND Interventions AND Outcome	2947	2947	0	182
Setting AND Interventions AND Outcome AND Patient	1844	0	0	0

CINAHL DEC 22 2009				
Search Term	Hits	Titles Searched	Abstracts Assessed	Selected
Single Term				
Discharge	49418	0	0	0
Communication	213302	0	0	0
Electronic	50637	0	0	0
Hospital	405801	0	0	0
General Practice	8933	0	0	0
Safety	74174	0	0	0
Patient	452008	0	0	0
Process	193147	0	0	0
Information	367331	0	0	0
Complete	106160	0	0	0
Quality	259016	0	0	0
Combined Terms (using OR)				
Setting (Hospital, GP)	107666	0	0	0
Intervention (Discharge, Communication, Electronic, Process, Information)	333462	0	0	0
Outcome (Safety, Complete, Quality)	215811	0	0	0
Patient	452008	0	0	0
Combined Terms (Using AND)				
Setting AND Interventions	31407	0	0	0
Setting AND Interventions AND Outcome	8690	0	0	0
Setting AND Interventions AND Outcome AND Patient	4957	4957	0	407

EMBASE Search Jan 2 2010				
Search Term	Hits	Titles Searched	Abstracts Assessed	Selected
Single Term				
Discharge	29999	0	0	0
Communication	28754	0	0	0
Electronic	8729	0	0	0
Hospital	83420	0	0	0
General Practice	23702	0	0	0
Patient	149777	0	0	0
Safety	15909	0	0	0
Process	8458	0	0	0
Information	131479	0	0	0
Complete	312464	0	0	0
Quality	58435	0	0	0
Combined Terms (using OR)				
Setting (Hospital, GP)	106608	0	0	0
Intervention (Discharge, Communication, Electronic, Process, Information)	199756	0	0	0
Outcome (Safety, Complete, Quality)	383772	0	0	0
Patient	149777	0	0	0
Combined Terms (Using AND)				
Setting AND Interventions	34110	0	0	0
Setting AND Interventions AND Outcome	3320	3320	0	328
Setting AND Interventions AND Outcome AND Patient	1175	0	0	0

MEDLINE				
Search Term	Hits	Titles Searched	Abstracts Assessed	Selected
Single Term				
Discharge	28707	0	0	0
Communication	41371	0	0	0
Electronic	10092	0	0	0
Hospital	67568	0	0	0
General Practice	55172	0	0	0
Safety	73937	0	0	0
Patient	1731485	0	0	0
Process	14473	0	0	0
Information	62398	0	0	0
Complete	219515	0	0	0
Quality	87169	0	0	0
Combined Terms (using OR)				
Setting (Hospital OR GP)	110860	0	0	0
Intervention (Discharge, Communication, Electronic, Process, Information)	130284	0	0	0
Outcome (Safety, Complete, Quality)	361381	0	0	0
Patient	1731485	0	0	0
Combined Terms (Using AND)				
Setting AND Interventions	10075	0	0	0
Setting AND Interventions AND Outcome	3048	3048	0	327
Setting AND Interventions AND Outcome AND Patient	1360	0	0	0

2) Study Characterisation Tables

Balaban 2007¹

Methods	Randomised Controlled Trial
Participants	96 Patients (47 Intervention, 49 Control)
Setting	Secondary Care
Country	USA
Interventions	Intervention group received electronic discharge form and telephone outreach
Outcomes	Follow-up rates within 21 days, readmission within 31 days, ED visit within 31 days, completion of workups post-discharge by primary care
Notes	25.5% of intervention had 1 or more of the outcomes of interest (55% of controls) 14.9% of intervention failed to follow-up within 21 days (40.8% controls)

Branger 1998²

Methods	Controlled Before and After Study
Participants	27 GP's and 2 general hospitals
Setting	Apeldoorn
Country	The Netherlands
Interventions	Comparison of traditional paper-based communication of discharge reports with introduction of electronic communication format and data interchange, measurement of time intervals
Outcomes	Time intervals from generation to delivery, doctor's satisfaction
Notes	Paper median 3 days, electronic median 1 hour, electronic more accurate, complete

Coleman 2006³

Methods	Randomised Controlled Trial
Participants	750 Patients (379 intervention, 371 control)
Setting	Large integrated delivery system in Colorado
Country	USA
Interventions	"Care Transitions Intervention" assistance with medication self-management, patient centred record owned and maintained by the patient to facilitate cross-site transfer of information, timely follow-up with care provider, list of "Red Flags"
Outcomes	Rate of non-elective rehospitalisation (30, 90, 180 days post discharge) rate of rehospitalisation for same condition
Notes	<p>Intervention provided patients with tools to take active role in care,</p> <p>Influence information transition quality</p> <p>Rehospitalisation within 30 days 8.3% intervention (11.9 controls)</p> <p>Rehospitalisation within 90 days 16.7% intervention (22.5% controls)</p> <p>Rehospitalisation within 180 days 25.6% intervention (30.7% controls)</p> <p>Findings significant</p>

Couper 1996⁴

Methods	Controlled Before and After Study
Participants	254 referral letters, 111 reply letters
Setting	Rural Hospital, KwaZulu Natal, Medical University of Southern Africa
Country	South Africa
Interventions	Introduction of a proforma letter, comparison of proforma effect, scoring system developed from literature
Outcomes	Quality improvement of letters, communication

	between practitioners
Notes	Improvement in quality of referral but not reply letters, no relationship between quality of referral and reply letters, standardisation is key

Crosswhite 1997⁵

Methods	Before and After Study
Participants	76 discharge summaries with medication information
Setting	North Mississippi Medical Centre
Country	USA
Interventions	Introduction of a multi-disciplinary automated discharge summary process
Outcomes	Deficits in documentation of clinical information, instructions, follow-up care, medications, patient education
Notes	Enhanced information management across the system, improvements in maintenance of complete information

Curran 1992⁶

Methods	Time Series Study
Participants	Phase 1 78 consecutive inpatients Phase 2 71 consecutive inpatients
Setting	Geriatric Medical Unit, Belfast
Country	Ireland
Interventions	Introduction of envelopes with pre-printed advice on hand delivery with plain envelopes and combination with postal delivery, comparison of hand delivered and postal delivery of discharge summaries
Outcomes	The rates of receipt by the GP, the value of postal communication and the effect of the combination hand +post

Notes	<p>The majority (33%) of plain envelopes received within 3 days (intervention 51%) Rates of same day delivery increased with intervention (13%) vs. 7% plain envelope</p> <p>Hand delivery quicker than postal.</p> <p>Failure to arrive (24% vs. 25%)</p> <p>Recommendations of combination and potential fax transfer</p>
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De Clifford 2009⁷

Methods	Time Series Study
Participants	2 Groups of 40 Consecutive Patients
Setting	Neurology and Respiratory Wards
Country	Australia
Interventions	Pharmacist-initiated script transition service for discharged patients
Outcomes	Time taken to discharge, number of prescribing errors
Notes	<p>Discharge time improved post intervention</p> <p>Time spent by pharmacists improved</p> <p>Time spent by doctors improved</p>

Dedhia 2009⁸

Methods	Controlled Before and After Study
Participants	423 Patients (238 pre-intervention, 185 post-intervention)

Setting	Medical wards 3 hospitals (Maryland, Pennsylvania, North Carolina)
Country	USA
Interventions	Intervention toolkit: (admission form, primary care fax, inter-disciplinary worksheet) Identifying barriers to discharge success, pharmacist-physician collaborative medication reconciliation, pre-discharge planning appointments
Outcomes	30 days readmission or return to ED, patient satisfaction
Notes	<p>Post-intervention return to ED within 3 days was 3% (10% pre-intervention), OR=0.25, 95% CI 0.10-0.62</p> <p>Rate of readmission within 30 days 14% (22% pre-intervention) OR=0.59 95% CI 0.34-0.97</p> <p>Rate of return to ED 14% (21% pre-intervention) OR=0.61 95% CI 0.36-1.03 <i>P</i>= 0.06</p>

Eden 2008⁹

Methods	Before and After Study
Participants	500 patients (250 paper-based, 250 electronic) patient records
Setting	Oregon Health and Science University Hospital, Portland Labour and Delivery Unit
Country	USA
Interventions	Compare documentation quality and comprehensiveness, workflow before and after implementation of electronic health record
Outcomes	Presence of key clinical information, patient history, workflow
Notes	<p>Data significantly more likely to be missing from paper-based</p> <p>Computer-related activity significantly increased with implementation of EHR, as well as direct patient care activities</p>

Mant 2002¹⁰

Methods	Controlled Before and After Study
Participants	243 GP's
Setting	South East Area Health Service, Sydney
Country	Australia
Interventions	Agreed minimum dataset for medication information
Outcomes	Changes in the minimum dataset GP Opinions Direct notification of hospital admission episode Receipt of medication information from GP's Receipt of summary from hospital
Notes	Notification of GP's unaffected GP sending information to hospital increased GP receipt of information increased

O'Leary 2009¹¹

Methods	Before and After Study
Participants	101 summaries pre-intervention, 95 post-intervention
Setting	Northwestern Memorial Hospital, Chicago, Illinois
Country	USA
Interventions	Electronic discharge system
Outcomes	Timeliness, content of summaries, medical errors, quality of discharge summary
Notes	EDS well received, significant improvement in quality and timeliness, but timeliness less than optimal

Olsen 1995¹²

Methods	Before and After Study
Participants	31 discharges from hospital to nursing home (16 residents)
Setting	General Medical Ward, Urbana-Champaign, Illinois
Country	USA
Interventions	Electronic transmission of discharge summaries
Outcomes	Reduction in telephone calls to complete discharge, degree of completeness of discharge summary, workflow
Notes	Significant reduction in telephone calls, discharge summaries more timely, comprehensive

Paquette-Lamontagne 2001¹³

Methods	Controlled Before and After Study
Participants	89 Patients and 669 Discharge Medications
Setting	3 teaching hospitals, Montreal
Country	Canada
Interventions	New Discharge Prescription Form Vs. Usual Discharge Form
Outcomes	Six Criteria to Assess Drugs on Discharge Form
Notes	Integration of Admission Medications, In-Patient Changes, and Medications on Discharge on a Single Form Increased Conformity of Patient Profiles Post-Discharge. May Decrease Drug-Related Problems Post-Discharge

Preen 2005¹⁴

Methods	Randomised controlled trial
Participants	189 patients from respiratory, cardiovascular and general medical wards at 2 hospitals
Setting	Multi-centre hospitals in Perth, Western Australia
Country	Australia
Interventions	Intervention (discharge care plan, completed pre-discharge and sent to primary care) and control groups (existing hospital process)
Outcomes	Patient and GP surveys pre-discharge and 7 days post-discharge for quality of life and opinions of discharge process. Length of hospital stay
Notes	<p>Improvements were significant (discharge planning involvement, access to health services, confidence in process, and opinions)</p> <p>No difference in length of stay, but speed of communication between hospital and GP improved significantly</p>

Rao 2005¹⁵

Methods	Before and After Study
Participants	240 patients
Setting	Monmouth Medical Centre, New Jersey
Country	USA
Interventions	<p>Introduction of standardised template</p> <p>Comprehensive discharge summary test instrument</p>
Outcomes	Quality scoring of summaries: relevant content, exclusion of irrelevant detail, consistent with diagnosis, clarity
Notes	<p>Dictation skills did not improve with experience</p> <p>Dictation quality was not affected by time lapse from discharge</p>

	<p>Dictation length shortened with intervention</p> <p>No ideal ratio of length and hospital care needed</p> <p>Intervention resulted in better and shorter summaries</p>
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Sandler 1989¹⁶

Methods	Controlled Before and After Study
Participants	275 consecutive discharges (258 patients)
Setting	General Medical Ward Teaching Hospital, Nottingham
Country	England
Interventions	Patients received a card and Interim Discharge Letter to GP then completed a questionnaire
Outcomes	Patient satisfaction, quality of discharge summary and follow-up
Notes	Card considered helpful, contained sufficient information, easy to read, well completed

Sands 1994¹⁷

Methods	Randomised Clinical Trial
Participants	2165 Patients (63% Intervention, 37% Control)
Setting	General Medical Service, Beth Israel Hospital, Boston
Country	USA
Interventions	Computer program to improve discharge process (guidance to physicians, patient education, electronic notification of medication changes to primary care)
Outcomes	Use and satisfaction by House Officers, patient outcomes (days Before ED readmission, length of

	stay, number of medications)
Notes	Computer assisted compilation of discharge information useful for discharge process quality improvement

Smith 1989¹⁸

Methods	Before and After Study
Participants	103 pre-intervention, 104 post-intervention
Setting	The Medical College of Georgia Hospitals and Clinics, Augusta
Country	USA
Interventions	Application of hospital patient information systems to the generation of narrative discharge summaries
Outcomes	Days between discharge and discharge summary
Notes	Average pre-intervention 20 days, post-intervention 4 days

Van Walraven 1999¹⁹

Methods	Randomised Clinical Trial
Participants	Voice Dictation (151 Patients) Database Generated (142 Patients)
Setting	Teaching Hospital Ottawa
Country	Canada
Interventions	Voice dictated discharge summaries vs. database generated
Outcomes	Proportion of patients for whom summaries were generated within 4 weeks of discharge, physician ratings of preference, quality, completeness, organisation and timeliness

Notes	<p>Database more likely to be generated within 4 weeks (79.6%) 57% controls $P < 0.001$</p> <p>Quality and completeness were similar, items of interest more likely on database summaries, faster and more preferred</p>
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Vira 2006²⁰

Methods	Controlled Before and After Study
Participants	60 Patients
Setting	Markham Stouffville Community Hospital
Country	Ontario, Canada
Interventions	Usual clinical practice vs. pharmacist conducting medication reconciliation, interviews and examination of medication vials, obtaining comprehensive medication history, time required by pharmacist
Outcomes	Differences between medication use at home and admission medication orders
Notes	<p>60% of patients had 1 or more unintended variances at discharge</p> <p>11 patients clinically important variances</p> <p>Mean number of unintended variances per patient 2.3</p> <p>Intervention interrupted 20 clinically important variances</p>

Wood 2009²¹

Methods	Controlled Before and After Study
Participants	150 Patients
Setting	Two Private Mental Health Care Hospitals in New South Wales
Country	Australia

Interventions	Developed a standardised discharge and outcome assessment strategy (3 cycles)
Outcomes	Time between discharge date and summary, time between discharge and follow-up call
Notes	100% of summaries faxed to within 48 hours, 80% received follow-up call within 1 week, 100% follow-up call within 10 days

3) Data Abstraction Tables

Year	Author and Journal Details	Title	Location and Country	Study Type	Sample and Methods	Study Findings and Key Points
2002 ¹	Abrahamian, H., Schueller, A. Journal of Telemedicine and Telecare Vol 8 Issue 6 pp 350-355	Transfer of Knowledge from the Specialist to the Generalist by Videoconferencing: Effect on Diabetes	Vienna, Austria	Cross-sectional	*154 Type 2 Diabetic Patients, 1 Diabetes Specialist, 4 GP's *Treatment Network established, target values, videoconferencing, interview duration 12 mins	*Diabetes centre contacted 94 times *Low usage by GP with lowest technical training *Intervention improved quality of diabetes care overall *Intervention permitted systematic approach to risk stratification and targeted diabetic patients by transfer of knowledge from the specialist to the GP *Prescribing routines and patterns in GP's changed
1998 ²	Archbold, R.; Laji, K.; Suliman, A.; Ranjadayalan, K.; Hemingway, H.; Timmis, A.	Evaluation of a Computer-Generated Discharge Summary For Patients with Acute Coronary Syndromes	London, England	Cross-sectional	*147 GP's, 66 Local Surgeries in London *Design of structured, computer generated summary integrated with hospital database, comparison to dictated summaries	*Outcomes: GP preferences, feature comparison of each summary type, ability to identify clear patient management plan, delay in receipt of summary *68.5% preferred intervention, contained relevant content, concise, clear subheadings, ability to locate information quickly 66.9% favoured intervention to provide clear management plan 88.2% would accept a delay of 1 week
2007 ³	Balaban, R., Weissman, J.; Samuel, P.; Woolhandler, S. Journal of General Internal Medicine Vol 23 Issue 8, pp 1228-1233	Redefining and Redesigning Hospital Discharge to Enhance Patient Care: A Randomised Controlled Study	Somerville MA, USA	Randomised Controlled Trial- Intervention with Electronic Summary	*96 Patients (47 Intervention, 49 control) * Intervention received Patient Discharge Form and telephone outreach *Measured 4 outcomes *Comparison to controls	*25.5% of intervention had 1 or more of the outcomes of interest (55% of controls) *14.9% of intervention failed to follow up within 21 days compared to 40.8% of controls * Discharge intervention improves the rates of follow up and completion of workups after discharge
2009 ⁴	Bergkvist, A.; Midlov, P.; Hoglund, P.; Larson, L.; Bondesson, A.;	Improved Quality in the Hospital Discharge Summary	Sweden	Longitudinal Study: Intervention and Control Group	*52 patients intervention, 63 in control *Discharge summary with medication report	*Discharge summaries for 172 patients were evaluated, only 1 was without discrepancies and did not need updating * 46/172 summaries were correct and complete *Number of medication errors decreased from 12%

	Erikson, T. European Journal of Clinical Pharmacology Volume 65 pp 1037-1046	Reduces Medication Errors: LIMM: Landskrona Integrated Medicines Management			was developed in house to reduce transfer errors *Pharmacist intervention medication reconciliation at admission, , systematic medication care plan developed *physician completed discharge summary on day of discharge , pharmacist evaluated this using a checklist	in control to 4.8% in intervention group (not significant) *Poor communication at transition points may account for nearly 50% of all medication errors and 20% of adverse events (Institute for Healthcare Improvement)
1992 ⁵	Branger, P.; Van der Wooden, JC.; Schudel, B.; Verboog, E.; Duisterhout, J.; Van Der Lei, J.; Van Bommel, J. British Medical Journal Vol 305 pp1068-1070	Electronic Communication Between Providers of Primary and Secondary Care	Apeldoorn Netherlands	Descriptive Comparison of Paper/ Electronic	* 27 GP's *Questionnaire, Interviews, Measurements	*Mailed summaries took 2-4 days to reach GP's, with electronic time decreased to 1 hour *15 GP's reported that the use of electronic provided more accurate and complete information *Electronic communication between SC and PC is a feasible option for improving communications
1999 ⁶	Carey, S.; Hall, D. Scottish Medical Journal Volume 44 Issue 3 pp 79-80	Immediate Psychiatric Discharge Letters by Fax	Dumfries, Scotland	Descriptive Intervention	* 160 patients * Pilot use of structured handwritten immediate discharge letter, given to the patient for the GP *Questionnaire sent to the GP *Discharge letter handwritten, sent to GP by fax	* 55% response rate, 82% of GP's received letter by fax *80% felt letter was legible *Medication was reported as present 96% *GP's satisfied with rate of production, and quality satisfactory by 99% *The Immediate letter is sent by letter, followed by a full letter within 1 week

2006 ⁷	Coleman, E.; Parry, C.; Chalmers, S.; Min, S. Archives of Internal Medicine Vol 166 Issue 17 pp 1822-1828	The Care Transitions Intervention: Results of a Randomised Controlled Trial	Colorado, USA	Randomised Controlled Trial	*750 patients (379 intervention, 371 controls) *“Care Transitions Intervention” assistance with medication self-management, patient centred record owned and maintained by the patient to facilitate cross-site transfer of information, timely follow-up with care provider, list of “Red Flags”	*Outcomes: Rate of non-elective rehospitalisation (30, 90, 180 days post discharge) rate of rehospitalisation for same condition *Intervention provided patients with tools to take active role in care, Influence information transition quality Rehospitalisation within 30 days 8.3% intervention (11.9 controls) Rehospitalisation within 90 days 16.7% intervention (22.5% controls) Rehospitalisation within 180 days 25.6% intervention (30.7% controls) Findings significant
2004 ⁸	Cortes, T.; Wexler, S.; Fitzpatrick, J. Journal of Gerontological Nursing June 2004 pp 10-15	The Transition of Elderly Patients Between Hospitals and Nursing Homes: Improving Nurse to Nurse Communication	New England, USA	Descriptive Intervention	*3 Hospitals and 6 nursing homes Using Practice Improvement Cluster Communication Model with the aim of standardisation *Patient Transition Information Checklist created to accompany patient	*Quality of patient transfer depends on collaboration of inter-disciplinary team *Difficulty in initiating timely and effective care plans for transferred patients *The amount of information that accompanies patients is poor this affects the continuum of care
1996 ⁹	Couper, I.; Henbest, R. South African Medical Journal Vol 86 Issue 12 pp 1540-1542	The Quality and Relationship of Referral and Reply Letters: The Effect of Introducing a Proforma Letter	Kwazulu-Natal, South Africa	Intervention Study, Pre-Post Proforma Letter	*254 referral letters and 111 reply letters *Before and after comparison of the effect of using a proforma referral letter *Scoring system developed based on list of essential items in literature	*There was a significant improvement in the quality of the referral letters but not the reply letters *There was no relationship between the quality of the two letters *Communication between practitioners is key to the continuation of care *Proforma improved the quality of referral but not reply *Standardisation is key, but personal contact remains integral *GP's and Consultants criticise each other for the lack of content in the letters exchanged

1997 ¹⁰	Crosswhite, R.; Beckham, S.; Gray, P.; Hawkins, P.; Hughes, J. American Journal of Managed Care Vol 3 pp 473-479	Using a Multi-Disciplinary Automated Discharge Summary Process to Improve Information Management Across the System	Mississippi, USA	Before and After Study	*76 Discharge summaries with medication information *intervention introduced a multi-disciplinary automated discharge summary process	*Deficits in documentation of clinical information observed, instructions, follow-up care, medications, patient education *enhanced information management across the system resulted, improvements in maintenance of complete information
1992 ¹¹	Curran, P.; Gilmore, D.; Beringer, T. Ulster Medical Journal Vol 61 pp 56-58	Communication of Discharge Information for Elderly Patients in Hospital	Belfast, Ireland	Time Series Study	*Phase 1 78 consecutive inpatients Phase 2 71 consecutive inpatients *Introduction of envelopes with pre-printed advice on hand delivery with plain envelopes and combination with postal delivery, comparison of hand delivered and postal delivery of discharge summaries	*The rates of receipt by the GP, the value of postal communication and the effect of the combination hand +post * The majority (33%) of plain envelopes received within 3 days (intervention 51%) Rates of same day delivery increased with intervention (13%) vs. 7% plain envelope Hand delivery quicker than postal. Failure to arrive (24% vs. 25%) Recommendations of combination and potential fax transfer
2009 ¹²	DeClifford, J.; Lam, S.; Leung; B. Journal of Pharmacy Practice and Research Vol 39 Pt 1 pp 39-42	Evaluation of Pharmacist-Initiated -Script Transition Service for Discharged Patients	Melbourne, Australia	Sequential Prospective Study Evaluation of an Intervention	*2 groups of 40 consecutive patients neurology and respiratory wards *Baseline and post intervention data collected on outcomes: time taken to discharge and number of prescribing errors	*Post intervention discharge time was improved, as well as for time spent by pharmacists amending prescriptions *time spent by doctors preparing prescriptions fell from 15 minutes to 2. *Combining prescribing roles with safety elements of electronic prescribing and medication reconciliation resulted in significant improvements in quality timeliness and accuracy of discharge prescriptions

2009 ¹³	Dedhia, P.; Kravet, S.; Bulger, J.; Hinson, T.; Sridharan, A.; Kolodner, K.; Wright, S.; Howell, E. Journal of the American Geriatric Society Volume 57 pp1540-1546	A Quality Improvement Intervention to Facilitate the Transition of Older Adults from 3 Hospitals Back to Their Homes	3 Distinct hospitals: Maryland, Pennsylvania, North Carolina, USA	Quasi-experimental pre-post design intervention	<p>*238 Pre-Intervention group and 185 post-intervention</p> <p>*Study feasibility and effectiveness of a discharge planning intervention</p> <p>*Intervention toolkit: admission form, fax to PCP, inter-disciplinary worksheet to identify barriers to discharge success, pharmacist-physician collaborative medication reconciliation, and pre-discharge planning appointments</p> <p>*Outcomes: 30 day re-admission and return to ED, patient satisfaction with discharge</p>	<p>*Post-intervention return to ED within 3 days of discharge was 3% compared to 10% pre-intervention OR=0.25, 95% CI 0.10-0.62 *Rate of readmission within 30 days 14% compared to 22% pre-intervention OR=0.59 95% CI 0.34-0.97 and return to ED 14% compared to 21% OR=0.61 95% CI 0.36-1.03 *P= 0.06</p> <p>*This intervention has potential to improve healthcare quality for the elderly, specifically because of their special needs and the complexities involved in providing this age group with high quality continuous care</p>
2008 ¹⁴	Eden, K.B.; Messina, R.; Li, H.; Osterweil, P.; Henderson, C.; Guise, J. American Journal of Obstetrics and Gynecology 119 pp 307 (1)	Examining the Value of Electronic Health Records on Labor and Delivery	Oregon, USA	Before and After Study	<p>*500 Patients (250 paper based, 250 electronic)</p> <p>*compare documentation quality and comprehensiveness, workflow before and after implementation of electronic health record</p>	<p>*Outcomes: presence of key clinical information, patient history, workflow</p> <p>*Data significantly more likely to be missing from paper based</p> <p>*Computer related activity significantly increased with implementation of EHR, as well as direct patient care activities</p>

1991 ¹⁵	Essex, B.; Doig, R.; Rosenthal, J.; Doherty, J. British Journal of General Practice Volume 41, pp 332-334	The Psychiatric Discharge Summary: A Tool for Management and Audit	London, UK	Descriptive Intervention	*115 patients discharged from Acute Psychiatric Unit (112 analysed) *Review information needs of GP's, design a discharge summary , assess its use, analyse the data, evaluate the usefulness for future audit purposes	* Staff found summaries easy to use after training, reduced uncertainty and helped focus *Provided useful data for audit easy to retrieve code and analyse *The use of a discharge summary needs staff training, staff need to know the objective of its use and how to use it *Use of this standardised summary is beneficial to all those involved in follow-up care
1998 ¹⁶	Flyer, B.; Rubenstein, L.; Robbins, A.; Wieland, G.; Henry, D.; Cugalj, N. Journal of Medical Education Vol 63 pp. 407- 409.	An Intervention to Improve the Hospital Discharge Summary	California, USA	Longitudinal Cohort Study	*142 discharge summaries, 11 residents * Educational: Develop and teach improved standardised discharge summary format (Comparison of discharge summaries prepared by residents before and after training session, using new format)	*Discharge summary completeness, clarity, brevity * Significant improvement in completeness of description of discharge and follow-up information, clarity and brevity post-intervention
2000 ¹⁷	Herbermann, M. Seminars for Nurse Managers Vol 8 No 1 pp 20-25	Building a Seamless System of Hospital-Home Health Services	New Jersey, USA	Descriptive Intervention	*Task force developed to assess roles of Utilisation Review, Case Management, Discharge Planning and Home Care	*Identified duplication of data as a key problem, referrals often incomplete and handwriting not legible, lack of understanding of each other's role and absence of guidelines *Roles restructured, forms computerised
1989 ¹⁸	Kendrick, A; Hindmarsh, D. British Medical Journal Vol 298 pp 362-363	Which Type of Hospital Discharge Report Reaches General Practitioners Most Quickly?	Weybridg e, Surrey, England	Longitudinal Cohort Study	2 GP Practices (50 and 60 patients respectively) Combined prescription form with discharge note, posted before or at the time of discharge	*Combined expected to reach GP sooner than separate forms *Time taken for both types to reach GP measured in days after discharge

2007	Kripalani, S.; Le Fevre, F.; Phillips, C. Et al Journal of the American Medical Association Vol 297 Issue 8 pp 831-841	Deficits in Communication and Information Transfer Between Hospital Based and Primary Care Physicians: Implications for Patient Safety and Continuity of Care	USA	Literature Review	<ul style="list-style-type: none"> *Medline, Cochrane, Hand search *Observational Studies (55) Investigating Communication and Information Transfer at Discharge * Controlled Studies (18) Evaluating the Efficacy of Interventions to Improve Information Transfer Data extracted on availability, timeliness, content and format of discharge communications, and PCP satisfaction *Intervention results summarised by effects on timeliness, accuracy, completeness, and quality of information transfer 	<ul style="list-style-type: none"> *Direct communication was infrequent (3%-20%) *Availability of discharge summary at first visits (12%-34%) and was still low at 4 weeks post-discharge (51%-77%) *PCP's were dissatisfied *Discharge summaries lacked important information *Interventions shortened delivery time *Use of standardised formats improved quality of documents
1991 ¹⁹	Lissauer, T.; Paterson, C.; Simons, A.; Beard, R. Archives of Disease in Childhood Vol 66 pp 433-436	Evaluation of Computer- Generated Neonatal Discharge Summaries	London, England	Longitudinal Cohort Study	<ul style="list-style-type: none"> *133 patients *Comparison of dictated and computer generated electronic discharge summaries 	<ul style="list-style-type: none"> *Outcomes: Number of available summaries Time taken to complete task Number of basic data items Summary readability Appropriateness of content for carer's

1988 ²⁰	Llewelyn, D.; Ewins, D.; Horn, J.; Evans, T.; McGregor, A. British Medical Journal Vol 297 Dec 1988 pp 1504-1506	Computerised Updating of Clinical Summaries: New Opportunities for Clinical Practice and Research?	England	Descriptive Intervention	*91 patients *A new type of summary was formatted on the computer, 3 columns, findings, diagnosis, management * Evaluated over 3 months *Time from discharge to completion of summary was recorded	*9 summaries were typed in the new format as well as the old format to assess the difference in time consumed *Time taken was shortened and the new system deemed more efficient, faster, and safer to use * Offers suggestions for other ways to improve on the efficiency and speed of preparing and sending out the summaries
2002 ²¹	Mant, A.; Kehoe, L.; Cockayne, N.; Kaye, K.; Rotem, W. Medical Journal of Australia Vol 177 pp 32-34	A Quality Use of Medicines Program for Continuity of Care in Therapeutics from Hospital to Community	Sydney, Australia	Before and After Study	*243 GP's *Agreed minimum dataset for medication information	* Changes in the minimum dataset GP Opinions Direct notification of hospital admission episode Receipt of medication information from GP's Receipt of summary from hospital * Notification of GP's unaffected GP sending information to hospital increased GP receipt of information increased
2006 ²²	Nace, G.; Graumlich, J.; Aldag, J. Informatics in Primary Care Vol 14 pp109- 119	Software Design to Facilitate Information Transfer at Hospital Discharge	Illinois, USA	Descriptive Intervention Study	*336 discharges by 19 users *Designed a software application to replace the current discharge process, performance improvement model *Qualitative surveys with physicians	*average time per physician was 42minutes (ranger 24-67) *CPOE software helped physicians transfer timely, complete, legible information out of the hospital, helps to overcome communication barriers that impact quality of care and efficiency of hospital discharge

2009 ²³	O'Leary, K. ; Leibovitz, D.; Feinglass, J.; Liss, D.; Evans, D.; Kulkarni, N.; Landler, M.; Baker, D. Journal of Hospital Medicine Vol 4 Number 4 pp 219- 225	Creating a Better Discharge Summary: Improvement in Quality and Timeliness Using an Electronic Discharge Summary	Chicago, Illinois, USA	Pre-Post Intervention Evaluation	*101 summaries pre and 95 summaries post implementation of the electronic discharge system *Outpatient physician survey, evaluation of timeliness and content of discharge summaries, medical errors, the quality of the discharge summary	*EDS well received, significantly improved quality and timeliness of summaries completed, but timeliness remained less than optimal *Reference List
1995 ²⁴	Olsen, B.; Adamek, M. Journal of Applied Gerontology Vol 14 pt 2 pp 210-223	Streamlining Discharge Planning for Patients Returning to Nursing Homes: The Electronic Transmission of Medical Records	Chicago, USA	Quasi- experimenta l pre-post design intervention	*31 discharges from hospital to 7 nursing homes, 16 nursing home residents *Evaluation of discharges, telephone survey, fax machine evaluation	*Significant reduction in telephone calls to complete the discharge *The use of electronic transmission may be beneficial, comprehensive and timely
2001 ²⁵	Paquette- Lamontagne, N.; McLean, W.; Besse, L.; Cusson, J. Annals of Pharmacothera py Vol 35 Issue 7 pp 953-958	Evaluation of a New Integrated Discharge Prescription Form	Montreal, Canada	Non- Randomised Trial	*89 Patients and 669 Discharge Medications * New Discharge Prescription Form Vs. Usual Discharge Form	*Six criteria to assess drug information on discharge form *Integration of Admission Medications, In-Patient Changes, and Medications on Discharge on a Single Form Increased Conformity of Patient Profiles Post- Discharge. Tool May Decrease Drug-Related Problems Post-Discharge
2005 ²⁶	Preen, D.; Bailey, B.; Wright, A. International Journal for Quality in Healthcare Vol	Effects of a Multi- Disciplinary, Post-Discharge Continuance of Care Intervention on	Perth, Australia	Randomised Controlled Trial	*189 patients from respiratory, cardiovascular and general medical wards at 2 hospitals * Intervention (discharge care plan,	*Outcomes: Patient and GP surveys pre-discharge and 7 days post-discharge for quality of life and opinions of discharge process. Length of hospital stay *Improvements were significant (discharge planning involvement, access to health services, confidence in process, and opinions) No difference in length of stay, but speed of

	17 pp 43-51	Quality of Life, Discharge Satisfaction, and Hospital Length of Stay: A Randomised Controlled Trial			completed pre-discharge and sent to primary care) and control groups (existing hospital process)	communication between hospital and GP improved significantly
2005 ²⁷	Rao, P.; Andrei, A.; Fried, A.; Gonzalez, D.; Shine, D. American Journal of Medical Quality Vol 20 pp 337-343	Assessing Quality and Efficiency of Discharge Summaries	New Jersey, USA	Before and After Study	*240 patients * Introduction of standardised template Comprehensive discharge summary test instrument	*Outcomes: Quality scoring of summaries: relevant content, exclusion of irrelevant detail, consistent with diagnosis, clarity *Dictation skills did not improve with experience Dictation quality was not affected by time lapse from discharge Dictation length shortened with intervention No ideal ratio of length and hospital care needed Intervention resulted in better and shorter summaries
1989 ²⁸	Sandler, D.; Heaton, C.; Garner, S.; Mitchell, J. British Medical Journal Vol 299 December 1989 pp 1511-1513	Patients and General Practitioners Satisfaction with Information Given on Discharge from Hospital: Audit of a New Information Card	Nottingham England	Descriptive Intervention Study	*275 consecutive discharges for 258 patients *At discharge patients received a card and interim discharge letter to the GP, then complete a questionnaire	*Card was considered very helpful, and contained sufficient information, very easy to read, well completed *Potential for this intervention to positively impact the discharge process
1994 ²⁹	Sands, D.; Safran, C. Proceedings of the Annual Symposium of Computer Applications in Medical Care pp. 841-845	Closing the Loop of Patient Care: A Clinical Trial of Computerised Discharge Medication Program	Boston, Massachusetts, USA	Randomised Clinical Trial	*2165 Patients (63% Intervention, 37% Control) * Computer program to improve discharge process (guidance to physicians, patient education, electronic notification of medication changes to primary care)	* Outcomes: Use and satisfaction by House Officers, patient outcomes (days Before ED readmission, length of stay, number of medications) * Computer assisted compilation of discharge information useful for discharge process quality improvement

1989 ³⁰	Smith, R.; Holzman, G. Obstetrics and Gynecology Vol 73 pp 803-807	The Application of a Computer Database System to the Generation of Hospital Discharge Summaries	Augusta, Georgia, USA	Before and After Study	*103 Pre-intervention, 104 post-intervention * Application of hospital patient information systems to the generation of narrative discharge summaries	*Outcome: days between discharge and discharge summaries *Average pre-intervention: 20 days, post- intervention: 4 days
1998 ³¹	Van Walraven, C.; Duke, S.; Weinberg, A. ; Wells, P. Canadian Family Physician Vol 44 pp 62-69	Standardised or Narrative Discharge Summaries: Which Do Family Physicians Prefer?	Ottawa, Canada	Survey	*180 family physicians * Summary information was abstracted using a data form to form a standardised summary Physicians were sent both types	*Outcome: Physician format preference * Standardised format preferred, provided more information relevant to care, ease of locating information, shorter length
1999 ³²	Van Walraven, C.; Laupacis, A.; Seth, R.; Wells, G. Canadian Medical Association Journal February 1999 Vol 160 Iss 3 pp 319-326	Dictated Vs. Database Generated Discharge Summaries: A Randomised Clinical Trial	Ottawa, Canada	Randomised Clinical Trial	* Voice Dictation (151 Patients) Database Generated (142 Patients) * Voice dictated discharge summaries vs. database generated	*Outcomes: Proportion of patients for whom summaries were generated within 4 weeks of discharge, physician ratings of preference, quality, completeness, organisation and timeliness * Database more likely to be generated within 4 weeks (79.6%) 57% controls P<0.001 Quality and completeness were similar, items of interest more likely on database summaries, faster and more preferred
2006 ³³	Vira, T.; Colquhoun, M.; Etchells, E. Quality and Safety in HealthCare Vol 15 pp 122-126	Reconcilable Differences: Correcting Medication Errors at Hospital Admission and Discharge	Ontario, Canada	Descriptive Prospective Intervention Study	*60 patients from 168 admissions *Assessing medications reconciliation	*60^% had variances in medication from admission to discharge, the process intercepted 75% before patient harm could occur * Potentially useful intervention for medications safety

2009 ³⁴	Wood, S.; Campbell, A. Medical Journal of Australia Volume 190 S11 pp 144- 149	Inpatient Care to Community Care: Improving Clinical Handover in the Private Mental Health Setting	New South Wales, Australia	Descriptive Intervention Study	*150 patients *Quality Improvement Intervention *Developing a Standardised Discharge and Outcome Assessment Strategy *Written Questionnaire *Telephone Interviews (3 cycles)	*Positive results of the intervention *Standardised discharge communication strategy improved timeliness, content, and format information provided to the community, well accepted by stakeholders
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4) Assessment of Methodological Quality

Abrahamian	Archbold	Balaban	Bergkvist	Branger	Carey	Coleman	Cortes	Couper	Crosswhite
-Rate of Contact -GP Network Utilisation -Quality of Care -Transfer of Information -Risk Stratification, -GP Patterns	-GP Preferences -Feature Comparison -Ability to Identify Clear Patient Management Plan -Delay in Receipt	-Follow-Up Rates within 21 days -Readmission within 31 days -ED visit within 31 days -Completion of Workups Post-Discharge	-Discharge Summary Correctness and Completeness-Need for Updating - Number of Medication Errors	-Time Intervals from generation to delivery -Doctor's satisfaction	-GP Receipt of Letters -Legibility -Presence of Medication Information -GP Satisfaction	-Rate of Non-Elective Rehospitalisation (30, 90, 180 days post discharge) -Rate of Rehospitalisation for same condition	-Quality of Patient Transfer -Increased team collaboration -Content -Creation of Timely and Effective Care Plans	-Quality Improvement of Letters -Communication Between Practitioners	-Deficits in Documentation of Clinical Information -Instructions, Follow-Up Care, Medications, Patient Education
Curran	De Clifford	Dedhia	Eden	Essex	Flyer	Herbermann	Kendrick	Lissauer	Llewelyn
-Rates of receipt by GP -Value of post -Effect of combination hand +post	-Time Taken to Discharge -Number of Prescribing Errors	-30 Days Readmission or Return to ED -Patient Satisfaction	-Document Quality and Comprehensive ness-Workflow Before and After Implementation of EHR -Presence of Key Clinical Information	-Ease of use -Brevity of information and content	-Discharge summary completeness -Clarity and brevity	-Data duplication -Letter completeness -Handwriting legibility -Understanding of roles -Guidelines presence	-Time taken for summaries to reach the GP (summary alone vs. combined with prescription)	-Available summaries -Time taken to complete task -Number of basic data items -Summary readability -Appropriate content for carer's	-Time from discharge to when summary is completed
-Mant	Nace	O'Leary	Olsen	Paquette	Preen	Rao	Sandler	Sands	Smith
-Changes in minimum dataset -GP Opinions -Notification of hospital episode -Receipt of medication information from GP's -Receipt	-Time Needed by Physicians -Time needed to transfer information -Completeness and legibility of information	-Timeliness -Content of Summaries -Medical Errors -Quality of the Discharge Summary	-Reduction in Telephone Calls to Complete Discharge -Degree of Completeness of Discharge Summary -Workflow	-Conformity to the criteria for discharge information -Health care professional's satisfaction -Integration of information on discharge	-Discharge planning involvement -Access to services -GP opinions -Length of stay -Speed of communication	-Quality of summaries -Dictation quality -Summary rating	-Quality of discharge summary -Quality of Follow-up -Patient satisfaction	-Use and Satisfaction by House Officers -Patient Outcomes (Days Before ED Readmission, Length of Stay, Number of Medications)	-Days between discharge from hospital and the generation of a summary
Van Walraven	Van Walraven	Vira	Wood						
-Physician format preference	-Proportion of summaries within 4 weeks -Physician preference -Quality -Completeness -Organisation -Timeliness	-Differences Between Medication Use At Home and Medication Orders on Summaries (Variance)	-Physician and Patient Satisfaction -Time Between Discharge Date and Summary -Time Between Discharge and Follow-Up Call						

Initial Assessment of Included Intervention Studies for Potential Inclusion in Systematic Review and Meta-analysis

	Author	Outcome of Interest	Assessment Result	Included
1.	Abrahamian	Rate of contact, quality of care and transfer of information from specialist to generalist	Not outcome of interest	No
2.	Archbold	GP preferences, delay in summary receipt	Study methods not strong enough	No
3.	Balaban	Follow-up rates	Not outcome of interest	No
4.	Bergkvist	Errors in medication	Not outcome of interest	No
5.	Branger	Time intervals from generation to delivery	Cross-sectional	No
6.	Carey	GP receipt of letters, presence of medication information	No controls	No
7.	Coleman	Rate of rehospitalisation	Not outcome of interest	No
8.	Cortes	Quality of patient transfer, timely creation of care plans	No quantitative data	No
9.	Couper	Quality improvement of letters, communication between practitioners	No baseline data	No
10.	Crosswhite	Deficits in documentation of information	Experimental study on discharge summary CONTENT	Yes
11.	Curran	Rates of receipt by GP	Before and after study on TIME	Yes
12.	De Clifford	Time taken to discharge, number of prescribing errors	Not outcome of interest	No
13.	Dedhia	Readmission	Not outcome of interest	No
14.	Eden	Presence of key clinical information	Before and after study on CONTENT	Yes
15.	Essex	Ease of use, brevity of content	No baseline data	No
16.	Flyer	Summary completeness	Cohort study on CONTENT	Yes

17.	Herbermann	Data duplication, letter completeness	No baseline data	No
18.	Kendrick	Time taken for summary to reach GP	Cohort study on TIME	Yes
19.	Lissauer	Number of available summaries, time taken to complete task, number of basic data items	Comparison study of intervention to normal care on CONTENT	Yes
20.	Llewelyn	Time from discharge to completion of summary	Comparison study of intervention to normal care on TIME	Yes
21.	Mant	Changes in minimum dataset, GP opinions, receipt of medication information, summary receipt	Study on delivery methods, not outcome of interest	No
22.	Nace	Time needed by physicians, time needed to transfer information, completeness and legibility of information	No baseline data	No
23.	O'Leary	Timeliness and content of summaries, quality of discharge summary	Before and after study on CONTENT/TIME	Yes
24.	Olsen	Reduction in telephone calls to complete workup, completeness of summary	Before and after study on CONTENT	Yes
25.	Paquette	Drugs on discharge summary	Outcome measures not consistent	No
26.	Preen	GP opinions	Not outcome of interest	No
27.	Rao	Quality scoring of summaries for content	Scale so difficult to unpick	No
28.	Sandler	Patient satisfaction, quality of discharge summary and follow-up	No baseline data	No
29.	Sands	Use and satisfaction by house officers, patient readmission, length of stay, number of medication	Outcomes unrelated	No
30.	Smith	Days between discharge and summary	Before and after study on TIME	Yes
31.	Van Walraven 1	Physician format preference	Methods not strong enough (survey)	No
32.	Van Walraven 2	Proportion of patients with discharge summary generated within 4 weeks, physician preference, quality, completeness, timeliness	Randomised controlled trial on TIME/CONTENT	Yes
33.	Vira	Differences between medication use after discharge and medication issued	Not outcome of interest	No
34.	Wood	Physician and patient satisfaction, time between discharge and follow-up call	Not outcome of interest	No

Definitions of Outcomes: TIME (The Length of Time Needed to Generate Summary) and CONTENT (Information on Summary)

Comparison of the Selected Studies in Terms of the Summarisation of Findings

- Studies Assessed for Inclusion in the Meta-analysis for the Outcome of Interest: Content

Author Name	Intervention Description	Intervention Methods	Intervention Results/Findings
Crosswhite	Introduction of a multi-disciplinary automated discharge summary process	Automated Discharge Summary (ADS) Team Identified ways of improving medication documentation, evaluate manual discharge system, develop new process using step-wise approach Different people input discharge information centrally ADS Process (3 Report Format Tables) 3 rd is printed and sent out Training of staff on use of ADS	Using six indicators to assess differences in completed summaries in various hospital departments before and after ADS introduction <ul style="list-style-type: none"> (Results from 14 departments) Example: Labour and Delivery 1994 (89%) Labour and Delivery 1995 (96%)
Eden	Comparison of documentation quality and comprehensiveness, workflow before and after implementation of EHR	500 patients records (250 paper-based, 250 electronic) Pre and post intervention study compared using X ² and Fisher's Exact Tests	Paper records more likely to be missing information <ul style="list-style-type: none"> Admission status: 10-64% vs. 2-5% P<0.0001 Prenatal labs and history 22-66% vs. 1-16% P<0.0001 Direct patient care and computer activities increased after EHR <ul style="list-style-type: none"> 2 vs 12 and 12 vs 17 activities/shift P<0.0001
Flyer	Comparison of discharge summaries prepared by residents before and after training session, using new format	71 matched pairs of discharge summaries prepared by 11 medical residents 2 months before and after training session and introduction of new format Committee developed standardised discharge summary format and guidelines, instructions for dictation, rating form	Discharge summaries evaluated using 5-point Likert Scale (1=worst, 5=best) for quality of information Summary Scores for each discharge summary based on mean rating of 11 items Scores were compared pre and post by identifying matched pairs using T-Test and 2-tailed confidence intervals Significant improvement post-intervention
Lissauer	Comparison of dictated and computer-generated discharge summaries	133 inpatients during a 6-month period Computerised system developed for use by clinical staff, branching methods of data entry, linked to ICD codes, free text also Copy generated for PCP	94% of summaries available for dictated 98% of summaries available for computer-generated Dictated delayed up to 26 weeks Computer-generated done at discharge Main diagnosis missing 5% of dictated Main diagnosis missing 1% of computerised Dictated more readable but more items missing Computer-generated more suitable to carers

			Positive impact of computer system
O'leary	Comparison of traditional and electronic discharge summary systems	<ul style="list-style-type: none"> Survey of physicians Medical Record Review 101 summaries pre-intervention 95 summaries post-intervention	Physician rating used 5-point Likert Scale (1= very dissatisfied, 5=very satisfied) <ul style="list-style-type: none"> 226/416 (54%) physicians at baseline survey 256/397 (64%) physicians at post-intervention survey Satisfaction with quality and timeliness increased with use of electronic (mean quality rating 3.04 vs 3.64 $P<0.001$, mean timeliness rating 2.59 vs. 3.34 $P<0.001$) Medical records rated for timeliness and presence of 16 content areas <ul style="list-style-type: none"> More electronic completed within 3 days of discharge 44.8% vs. 74.1% $P<0.001$ Elements present on electronic more often (Follow-up instructions 75% vs. 52% $P=0.001$, pending test results 46.3% vs 13.9% $P<0.001$, information for patient 95.8% vs. 85.1% $P<0.001$) Electronic discharge system well-received, significant improvement in quality and timeliness, but timeliness still less than optimal
Olsen	Electronic transmission of discharge summaries	31 discharge summaries to 7 nursing homes 16 patients evaluated using usual telephone 15 patients evaluated using fax	Average time spent to complete discharge evaluations reduced from 3.8 to 3.2 hours Reduced number of calls needed to complete evaluation (18 calls usual procedure, 4 for fax) Electronic discharge summaries more timely, comprehensive
Van Walraven 2	Comparison of dictated and database-generated discharge summaries	151 dictated summaries 142 database-generated summaries Randomised clinical trial	Database summaries done in 4 weeks (79.6%) Dictated summaries done in 4 weeks (57%) $P < 0.001$ Quality and comprehensiveness similar (74.9 vs. Database more likely to contain items of interest Database faster and preferred

- **Studies Assessed for Inclusion in the Meta-analysis for the Outcome of Interest: Time**

Author Name	Intervention Description	Intervention Methods	Intervention Results/Findings
Curran	Comparison of hand-delivered and postal delivery of discharge summaries	Phase 1 78 consecutive inpatients Phase 2 71 consecutive inpatients Introduced printed envelopes for patients with instructions to give to GP, compared with plain envelopes and combination delivery	33% of pre-intervention received within 3 days 51% of post-intervention received within 3 days 7% of pre-intervention delivered same day 13% post-intervention delivered same day 24% of hand-delivered failed to arrive 25% of postal-delivery failed to arrive
Kendrick	Combination of prescription form with discharge summary, posted before or at time of discharge	2 GP Practices (50 and 60 patients)	Post-intervention reached GP faster Measured time taken in days after discharge
Llewelyn	Comparison of previous process to the introduction of new summary format and computerisation	91 patients New type of summary typed in 3 columns (findings, diagnosis, management) Evaluated over 3 months Recorded time from discharge to completion of summary	9 summaries typed in both formats to assess differences in time needed to complete task New system shortened time needed, more efficient, safer
O'Leary	Comparison of traditional and electronic discharge summary systems	101 summaries pre-intervention 95 summaries post-intervention	Electronic discharge system well-received, significant improvement in quality and timeliness, but timeliness still less than optimal
Smith	Comparison of previous process to the application of hospital patient information system to the generation of narrative discharge summaries	103 pre-intervention 104 post-intervention Measured days between discharge and summary	Pre-intervention 20 days between discharge and summary Post-intervention 4 days between discharge and summary
Van Walraven 2	Comparison of dictated and database-generated discharge summaries	151 dictated summaries 142 database-generated summaries Randomised clinical trial	Database summaries done in 4 weeks (79.6%) Dictated summaries done in 4 weeks (57%) P <0.001 Quality and comprehensiveness similar Database more likely to contain items of interest Database faster and preferred

In order to group them and be able to conduct the meta-analysis outcomes have to be described in a homogenous manner

B) Secondary Care Documentation

1) Data Collection Tool

Completeness of Information on Hospital Discharge: Data Collection Form Based on RCP Headings			
Type of Discharge Communication Audited:		Typed Dictated Discharge Letter	
		New Discharge Format	
Patient Identifier:	Name of Hospital/ Unit:	CRS Used in Compilation	
Gender:			
Ethnicity:	Date Patient Discharged:		
Data Item			
Heading/Subheading		Present	Not Present
GP DETAILS			
1	GP Name		
2	GP Address		
3	GP Practice Code		
PATIENT DETAILS			
4	Patient Surname, Forename		
5	Name Known As		
6	Date of Birth		
7	Gender		
8	NHS Number		
9	Patient Address		
10	Patient Telephone Number(s)		
ADMISSION DETAILS			
11	Method of Admission		
12	Source of Admission		
13	Hospital Site		
14	Responsible Trust		
15	Date of Admission		
16	Time of Admission		
DISCHARGE DETAILS			
17	Date of Discharge		
18	Time of Discharge		
19	Discharge Method		
	Discharge Destination		
20	A) Type of Destination		
21	B) Destination Address		
22	C) Living Alone		
23	Discharging Consultant		
24	Discharging Speciality/Dept.		

CLINICAL INFORMATION			
25	Diagnosis at Discharge		
26	Operations and Procedures		
27	Reason for Admission and Presenting Complaints		
28	Mental Capacity		
29	Advance Decisions to Refuse Treatment and Resuscitation Status		
30	Allergies		
31	Risks and Warnings		
32	Clinical Narrative		
33	Relevant Investigations and Results		
34	Relevant Treatments and Changes Made to Treatments		
35	Measures of Physical Ability and Cognitive Function		
36	Medication Changes		
37	Discharge Medications		
38	Medication Recommendations		
ADVICE, RECOMMENDATIONS AND FUTURE PLAN			
Hospital			
39	A) Action		
40	B) Person Responsible		
41	C) Appropriate Date and Time		
GP			
42	A) Action		
43	B) Person Responsible		
44	C) Appropriate Date and Time		
45	D) Suggested Strategies		
Community and Specialist Services			
46	A) Action		
47	B) Person Responsible		
48	C) Appropriate Date and Time		
49	Information Given to Patient and/ or Authorised Representative		
50	Patient's Concerns, Expectations and Wishes		
51	Results Awaited		
PERSON COMPLETING SUMMARY			
52	A) Doctor's Name		
53	B) Grade		
54	C) Specialty		
55	D) Date Discharge Record Completed		
56	E) Doctors Signature		
57	Distribution List		

Modified by Haya Zedan on 01 March 09

2) Royal College of Physicians Standards for the Structure and Content of Medical Records: Discharge Summary Headings and Definitions

Discharge Summary Headings and Definitions, Approved

The headings presented here are 'anchor' points for the clinical information in the discharge record. The detail and specialty specific requirements under each heading will be refined in work to follow. Not all headings are relevant in paper records nor on all occasions but they will be available in the electronic environment where greater flexibility for completion will be possible.

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 establishment.
- Hospital site	Physical site 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 advice 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 an Independent Mental Capacity Advocate (IMCA) 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 in patient 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: <ul style="list-style-type: none"> • Medication Dispensed on discharge • Medication Prescribed and not dispensed (eg 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. e.g.: 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	<p>Actions required/that will be carried out by the hospital department. To include:</p> <ul style="list-style-type: none"> • Action (e.g. Outpatient, pending investigations and results, outstanding issues) • Person Responsible • Appropriate Date and Time
- GP	<p>Actions required by the GP. To include:</p> <ul style="list-style-type: none"> • 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	<p>Actions requested/ planned/ agreed with Community Services (community matron, palliative care, specialist nurse practitioner, rehab team, social services). To include:</p> <ul style="list-style-type: none"> • Action • Person Responsible • Appropriate Date and Time
Information Given to Patient and/or Authorised Representative	<p>This can include: Relatives and Carers; Specific verbal advice and details of any discussions; Written information including leaflets, letters and any other documentation. Differentiation required between information given to patients, carers and any other authorised representatives.</p>
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	
- Specialty	
- Doctor's signature	Only needed on paper discharge record.
- Date of completion of discharge record	
Distribution list	

In the electronic environment some of these fields will be automatically completed.

3) Health Care of Older People

i. Health Care of Older People Inter-Rater Reliability Tables

GP PRACTICE CODE														
	R2				R3				R4				R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present
Present	0	0		Present	0	0		Present	0	0		Present	0	0
Not Present	0	13		Not Present	0	32		Not Present	0	13		Not Present	0	15
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13		Total Number of Cases		15
Complete Agreement				Complete Agreement				Complete Agreement				Complete Agreement		
k=1				k=1				k=1				k=1		
GENDER														
	R2				R3				R4				R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present
Present	0	1		Present	0	0		Present	0	0		Present	0	0
Not Present	0	12		Not Present	0	32		Not Present	0	13		Not Present	0	15
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13		Total Number of Cases		15
Number of Agreements Expected by Chance 12 (92.3%) Poor				Complete Agreement				Complete Agreement				Complete Agreement		
k=0				k=1				k=1				k=1		

NHS NUMBER											
	R2			R3			R4			R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present	
Present	7	0		Present	28	0		Present	4	0	
Not Present	3	3		Not Present	0	4		Not Present	0	9	
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13	
Number of Agreements Expected by Chance 6.8 (52%) Moderate				Number of Agreements Expected by Chance 25.0 (78.1%)				Number of Agreements Expected by Chance 7.5 (57.4%)			
k=0.51				k=1				k=1 Complete			

PATIENT ADDRESS											
	R2			R3			R4			R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present	
Present	11	2		Present	32	0		Present	13	0	
Not Present	0	0		Not Present	0	0		Not Present	0	0	
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13	
Number of Agreements Expected by Chance 11 (84.6%) Poor				Complete Agreement				Complete Agreement			
k=0				k=1				k=1			

METHOD OF ADMISSION											
	R2			R3			R4			R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present	
Present	1	0		Present	10	0		Present	5	0	
Not Present	0	12		Not Present	0	22		Not Present	0	8	
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13	
Number of Agreements Expected by Chance 11.2 (85.8%)				Number of Agreements Expected by Chance 18.3 (57%)				Number of Agreements Expected by Chance 6.8 (52.6%)			
k=1				k=1				k=1			

HOSPITAL SITE											
	R2			R3			R4			R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present	
Present	8	0		Present	28	0		Present	6	0	
Not Present	4	1		Not Present	0	4		Not Present	0	7	
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13	
Number of Agreements Expected by Chance 7.8 (59.7%) Fair				Number of Agreements Expected by Chance 25 (78.1%)				Number of Agreements Expected by Chance 6.5 (50.3%)			
k=0.23				k=1				k=1			

DISCHARGE METHOD														
	R2				R3				R4				R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present
Present	0	1		Present	15	0		Present	7	0		Present	9	0
Not Present				Not Present				Not Present				Not Present		
Present	1	11		Present	0	17		Present	0	6		Present	0	6
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13		Total Number of Cases		15
Number of Agreements Expected by Chance 11.2 (85.8%) Worse than Chance			Number of Agreements Expected by Chance 16.1 (50.2%)			Number of Agreements Expected by Chance 6.5 (50.3%)			Number of Agreements Expected by Chance 7.8 (52%)					
k= -0.083			k=1			k=1			k=1					
MENTAL CAPACITY														
	R2				R3				R4				R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present
Present	1	1		Present	3	0		Present	2	0		Present	1	0
Not Present				Not Present				Not Present				Not Present		
Present	0	11		Present	0	29		Present	0	11		Present	0	14
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13		Total Number of Cases		15
Number of Agreements Expected by Chance 10.3 (79.2%) Good			Number of Agreements Expected by Chance 26.6 (83%)			Number of Agreements Expected by Chance 9.6 (73.9%)			Number of Agreements Expected by Chance 13.1 (87.5%)					
k=0.63			k=1			k=1			k=1					

MEDICATION CHANGES											
R2			R3			R4			R5		
R1	Present	Not Present	R1	Present	Not Present	R1	Present	Not Present	R1	Present	Not Present
Present	5	5	Present	20	0	Present	6	0	Present	5	0
Not Present	1	2	Not Present	0	12	Not Present	0	7	Not Present	0	10
Total Number of Cases		13	Total Number of Cases		32	Total Number of Cases		13	Total Number of Cases		15
Number of Agreements Expected by Chance 6.2 (47.9%) Poor			Number of Agreements Expected by Chance 17 (53.1%)			Number of Agreements Expected by Chance 6.5 (50.3%)			Number of Agreements Expected by Chance 8.3 (55.5%)		
k=0.114			k=1			k=1			k=1		

HOSPITAL ACTION											
R2			R3			R4			R5		
R1	Present	Not Present	R1	Present	Not Present	R1	Present	Not Present	R1	Present	Not Present
Present	1	0	Present	4	0	Present	3	0	Present	4	0
Not Present	1	11	Not Present	0	28	Not Present	0	10	Not Present	0	11
Total Number of Cases		13	Total Number of Cases		32	Total Number of Cases		13	Total Number of Cases		15
Number of Agreements Expected by Chance 10.3 (79.2%) Good			Number of Agreements Expected by Chance 25 (78.1%)			Number of Agreements Expected by Chance 8.4 (64.5%)			Number of Agreements Expected by Chance 9.1 (60.8%)		
k=0.62			k=1			k=1			k=1		

GP SUGGESTED STRATEGIES														
	R2				R3				R4				R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present
Present	2	0		Present	6	0		Present	2	0		Present	7	0
Not Present	0	11		Not Present	0	26		Not Present	0	11		Not Present	0	8
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13		Total Number of Cases		15
Number of Agreements Expected by Chance 9.6 (73.9%)				Number of Agreements Expected by Chance 22.3 (69.5%)				Number of Agreements Expected by Chance 9.6 (73.9%)				Number of Agreements Expected by Chance 7.5 (50.2%)		
k=1				k=1				k=1				k=1		

INFORMATION GIVEN TO PATIENT														
	R2				R3				R4				R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present
Present	3	0		Present	0	0		Present	1	0		Present	2	0
Not Present	0	10		Not Present	0	32		Not Present	0	12		Not Present	0	13
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13		Total Number of Cases		15
Number of Agreements Expected by Chance 8.4 (64.5%)				Complete Agreement				Number of Agreements Expected by Chance 11.2 (85.8%)				Number of Agreements Expected by Chance 11.5 (76.8%)		
k=1				k=1				k=1				k=1		

DATE DISCHARGE RECORD COMPLETED											
	R2			R3			R4			R5	
R1	Present	Not Present		R1	Present	Not Present		R1	Present	Not Present	
Present	11	2		Present	32	0		Present	13	0	
Not Present	0	0		Not Present	0	0		Not Present	0	0	
Total Number of Cases		13		Total Number of Cases		32		Total Number of Cases		13	
Number of Agreements Expected by Chance 11 (84.6%) Poor				Complete Agreement				Complete Agreement			
k=0				k=1				k=1			

ii. Health Care of Older People Visual Representation

Audit of Discharge Summary Completeness

2008 Sample (48 Records- 39 Available)
Mean: 43.8% (Highest 61.4%, Lowest 29.8%)
Std. Dev. 7.141

[illegible]

2007 Sample- 49 Records (35 Available)
Mean: 41.4% (Highest 54.3%, Lowest 26.3%)
Std. Dev 6.142

256

4)Nephrology

i) Nephrology Handwritten Discharge Summary Template

Renal and Transplant Unit Discharge Summary

Patient ID:

Name :

Hospital No :

DOB :

Date of Admission:

Date of Discharge :

Named Consultant :

Ward :

Primary Diagnosis this admission:

Other diagnoses this admission :

Main background diagnoses:

Procedures performed :

Summary of main events this admission :

Medication on discharge: no need to complete as long as yellow TTO sheet attached

Additional actions required by GP:

Renal Unit Follow-up Plan:

Name and signature of completing doctor (legible!):

Date :

Additional copies to :

ii) Nephrology Electronic Discharge Summary Template

Nottingham University Hospitals 
NHS Trust

NHS Number:
Patient Identifier:

City Campus
Renal Unit
Hucknall Road
Nottingham
NG5 1PB

GP Name:
GP Address:

Tel: (0115) 9691169 Ext: 57795
Fax: (0115) 9627678

www.nuh.nhs.uk

Renal and Transplant Unit Discharge Summary

Re: Patient Name:
Patient Address:
DOB:

Admission Date:
Discharge Date:
Admitting Consultant:
Ward:

Primary diagnosis this admission	
Other diagnoses this admission	
Main background diagnoses	
Summary of main events this admission	
Medication on discharge (including doses)	
Additional actions required by GP	
Renal Unit follow up plan	

Signed: Doctor Name:
Grade and Specialty:




iii) Nephrology Visual Representation

Renal Handwritten Results

[illegible]

Renal Electronic Results

Data Item	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
GP Details																																																		
GP Name																																																		
GP Address																																																		
GP Practice Code																																																		
Patient Details																																																		
Patient Surname, Forename																																																		
Name Known As																																																		
Date of Birth																																																		
Gender																																																		
NHS Number																																																		
Patient Address																																																		
Patient Telephone																																																		
Admission Details																																																		
Method of Admission																																																		
Source of Admission																																																		
Hospital Site																																																		
Responsible Trust																																																		
Date of Admission																																																		
Time of Admission																																																		
Discharge Details																																																		
Date of Discharge																																																		
Time of Discharge																																																		
Discharge Method																																																		
Type of Destination																																																		
Destination Address																																																		
Living Alone																																																		
Discharging Consultant																																																		
Discharging Specialty/ Department																																							</											

	Present
	Not Present
	No Record Avail.

5) Paediatrics

i) Paediatrics Handwritten Discharge Summary Template

Nottingham University Hospitals 
NHS Trust

Children's Assessment Unit
Nottingham Children's Hospital
Queen's Medical Centre, Nottingham
Tel: 0115-9194425

F.A.O Dr. _____

Patient Name:	Date of Admission:
D.O.B.	Date of Discharge:
Address:	Consultant:
Tel:	Hospital No.:

Principle diagnosis and past history:

Presentation, treatment and progress:

Relevant investigations:

Discharge medication:

Follow up:

Signature:.....Print Name:.....

ii) Paediatrics Electronic Discharge Summary Template

Medical Discharge Summary			
REGISTERED GP Telephone: Practice Code:	PATIENT DETAILS Name: DOB: Sex: Address: Tel: NHS No: Hosp No:		
ADMISSION DETAILS Date: Hospital: Ward: Method:	DISCHARGE DETAILS Date: Cons: Spec/Dept:		
CLINICAL INFORMATION			
Presenting Complaint:			
Primary Diagnosis:			
Secondary Diagnoses:			
Co-morbidities:			
Operative / Investigative Procedures:			
Relevant Investigations Performed & Results:			
Other Comments, Progress in Hospital & Specialist Team Opinions:			
Allergies, Risks & Warnings: (known / recorded at NUH)			
If patient Under 16:			
Weight (kg)	Height (cm):	BMI: 0	BSA: 0
FOLLOW UP CARE			
Discharge Address:			
GP Follow up plan:			
Confidential GP Information:			
Outpatient Appointment:			
Support Services Arranged by Hospital:			
District Nurse / Practice Nurse Information:			
Smoking Cessation Status:			
Doctor completing summary:			

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MEDICATION ON DISCHARGE*No Change to Regular Medicine*

Medication	Dose	Route	Frequency	Treatment Duration Then Stop (C = Continue until Doctor says otherwise)	Instructions/ Reasons for Medication	Status (* see explanation notes below)	Issue	Supply Details

MEDICATION STOPPED*No Medications Intentionally Stopped*




Medication	Stopped Status (Permanent / Temporary)	Reason Stopped	Restart Instructions

Name of Doctor:**Name of Discharge Nurse:*****Status Notes:**

- **N** – Medication newly started in hospital and patient supplied with this medication
- **U** – Medication dose unchanged and patient should continue with their supply at home if the hospital has not provided a further supply
- **A** – Medication dose or time taken has been changed; patient advised to use the supply given to them in hospital at the dose and frequency listed in the table above

iii) Paediatrics Visual Representation

[illegible]

	Present
	Not Present
	No Record Avail.

6) Participant Information Sheet



Participant Information Sheet

Title of Study: Assessing Differences in Quality of Handwritten Vs. Electronic Discharge Summaries

Study Location: Nottingham University Hospitals Trust; i.e. Queen's Medical Centre and City Hospital, in Nottingham, UK.

Study Background: The NUH Trust, as part of the drive towards improving the quality and safety of care, is moving towards electronic documentation of patient information.

The Discharge Summary is a crucial document which transfers information on the patient's hospital stay to the community, to enhance the quality, safety, coordination and continuity of care. The more comprehensive and complete the information is on the summary, the more likely patient care is improved, and potential for adverse events is reduced.

NUH Hospital Departments have used a variety of methods to complete these summaries in the past, and are now moving towards using electronic systems, in the view that electronisation will improve rates of completion and transfer of information.

Study Objectives: The interviews conducted will support the research study in that they will assist the researcher in:

- Establishing the context of the study within the ward/department in question in terms of process and practice in the collation and issuance of the discharge summary.
- Determining the types of discharge communications used previously, and staff views in terms of advantages and disadvantages.
- Determining the potential for electronic discharge summaries to improve on rates of completion, completeness of information and transfer to the community (Primary Care Provider).

For inquiries please contact: Haya S. Zedan, MPH, FRSPH

PhD Candidate, Room 1422, D Floor, Division of Primary Care, Queen's Medical Centre, School of Community Health Sciences, University of Nottingham, Nottingham, NG7 2UH. **E-mail:** mcxhz1@nottingham.ac.uk

7) Interview Consent Form



Interview Consent Form

Title of Study: Assessing Differences in Quality of Handwritten Vs. Electronic Discharge Summaries

Ref: _____

Interview Location: _____

Name of Researcher: Haya S Zedan, MPH, FRSPH

Name of Participant: _____

Participant Job Title: _____

Please Initial Each Box

1. I confirm that I have read and understood the information sheet provided overleaf for the above study and have had the opportunity to ask questions of the researcher. ☐
2. I understand that my participation in this interview is voluntary and I am free to withdraw my comments at any time, and that this does not affect my rights. I understand that if I should choose to withdraw, my comments will not be quoted in the study outcome. ☐
3. I understand that the transcript of the interview and thus the data collected for the study may be looked at by authorized individuals from the University of Nottingham, NUH Trust and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to access these records and to collect, store, analyse and publish information obtained from my participation in this study. ☐
4. I understand that my personal details will be kept confidential. ☐
5. I agree to take part in an interview and understand that this interview will be audio-recorded and that anonymous direct quotes from the interview may be used in the study reports. ☐
6. I agree to take part in the study detailed overleaf. ☐

Participant:	Principal Investigator:
Date:	Date:
Signature:	Signature:

8) Interview Schedule

Draft Interview Schedule

Secondary Care Formal Structured Interviews

Further Qualitative Study

Begin interview by thanking them for taking the time to meet with me and an appreciation of their intense schedules. Ask how much time they have today and whether they would mind if I record the session as it helps me keep notes. Reassure them that all recordings are confidential; for my own use and that it will be deleted once I am finished. Hand out the participant information sheet and interview consent form and ask for them to read it and sign both copies. Give a few minutes for this and then thank them.

Briefly Detail PhD Background:

- 3rd year
- Working with Professors Tony Avery and John Gladman.
- PhD research is examining local attempts to improve discharge communication sent from hospital to primary care
- For this part of my PhD at the University, interested to learn from your experience as a physician (or other hospital staff) in dealing with various types of discharge summaries, in light of the recent Trust plans for electronification and on the quality of communication being issued from hospital in general
- Exhibit Pre-Post Study Findings and Follow with Interview Questions

Q1. What are your thoughts about the study findings I have presented today?

Q2. On the basis of these findings how do you think discharge communications can be improved in this/these department(s)?

Q3. In light of what this/these studies are showing, what do you think should be the next practical step?

Q4. What will you take away from the discussion we are having here today?

Q5. In what ways will these findings affect the way you think about further attempts by the Trust to increase the use of electronic discharge communications?

Q6. Is there anyone else who would you suggest I share these findings with?

This brings us to the end of our interview today; this has been very insightful for me, to be able to speak with you on this topic today. Thank you very much for your time.

C) Primary Care Documentation

1) Interview Study Recruitment Letter



August 5th,

2010

Dr. X. Practitioner
Fictional Medical Centre
63 Middle Avenue
Stapleford, Nottingham
NG9 2FB

Dear Dr. X. Practitioner,

I am a doctoral student at The University of Nottingham School of Community Health Sciences, Division of Primary Care, in the third year of my PhD. My work here at the University is being supervised by Professor Anthony J. Avery, Head of the Division. I am conducting research on *assessing differences in quality and safety of handwritten vs. electronic discharge summaries sent from secondary care to primary care*.

As you will know, the Discharge Summary is a crucial document which transfers information on the patient's hospital stay to the community, to enhance the quality, safety, coordination and continuity of care. The more comprehensive and complete the information is on the summary, and the more rapid it's transmission to the next point of care, the more likely patient care is improved, and potential for adverse events is reduced.

The NUH Trust, as part of the drive towards improving the quality and safety of care, is moving towards electronic documentation of patient information. NUH Hospital Departments have used a variety of methods to complete these summaries in the past, and are now moving towards using electronic systems, in the view that electronization will improve rates of completion and transfer of information. In view of the complexities of using this form of communication and the changes being introduced, I am interested in understanding the views of Primary Care Physicians as the direct recipients and users of these discharge summaries.

After contacting and obtaining required permissions from the Nottinghamshire County Teaching Primary Care Trust, your practice has been selected as part of a sample of GP Practices in the local area, and I am writing to request a short space of your time (45-60 minutes) where I might interview you on your views on both previous and current discharge summary use.

I would appreciate the opportunity to meet with you briefly and discuss your views on receiving discharge summaries to your practice. I am especially interested in your views regarding the efficiency in receipt and the quality of the information contained therein. I am sure my research will greatly benefit from your wide experience and any further insights you might have into this area. I feel that the findings of this research will enable me to develop a deeper understanding of the many complexities discharge communication.

As for confidentiality, please be assured that any information you supply will be treated in the strictest of confidence. Any information analysed or reported from the interview will not enable you to be recognised, and you are under no obligation to take part in any future research.

If you have any questions regarding this study or require further information, please do not hesitate to contact me by e-mail. I will contact your office the week of August 20th 2010 to set up a mutually convenient time for the interview. Thank you in advance for your kind cooperation.

Sincerely,
Haya. S. Zedan, MPH, FRSPH

For Enquiries Please Contact:

Haya S. Zedan, MPH, FRSPH, PhD Candidate
Division of Primary Care, School of Community Health Sciences,
University of Nottingham, Queen's Medical Centre,
Room 1422 D Floor, Nottingham, NG7 2UH
Telephone: 07523216712
E-mail: mcxhz1@nottingham.ac.uk

2) Interview Consent Form



Interview Consent Form

Title of Study: General Practitioners' Views on Hospital Discharge Summary Communications

Ref: _____

Interview Location: _____

Name of Researcher: Haya S Zedan, MPH, FRSPH

Name of Participant: _____

Participant Job Title: _____

Please Initial Each Box

1. I confirm that I have read and understood the information sheet provided overleaf for the above study and have had the opportunity to ask questions of the researcher.
2. I understand that my participation in this interview is voluntary and I am free to withdraw my comments at any time, and that this does not affect my rights. I understand that if I should choose to withdraw, my comments will not be quoted in the study outcome.
3. I understand that the transcript of the interview and thus the data collected for the study may be looked at by authorized individuals from the University of Nottingham, NUH Trust and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to access these records and to collect, store, analyse and publish information obtained from my participation in this study.
4. I understand that my personal details will be kept confidential.
5. I agree to take part in an interview and understand that this interview will be audio-recorded and that anonymous direct quotes from the interview may be used in the study reports.
6. I agree to take part in the study detailed overleaf.

Participant:	Principal Investigator:
Date:	Date:
Signature:	Signature:

3) Participant Information Sheet



Participant Information Sheet

Title of Study: General Practitioners' Views on Hospital Discharge Summary Communications

Study Location: Nottinghamshire County Teaching Primary Care Trust, Nottingham, UK (i.e. Several GP Surgeries NG7, NG8, and NG9)

Study Background:

This study is part of ongoing PhD research on assessing differences in quality and safety of traditional vs. electronic discharge summaries sent from secondary care to primary care.

The Discharge Summary is a crucial document which transfers information on the patient's hospital stay to the community, to enhance the quality, safety, coordination and continuity of care. The more comprehensive and complete the information is on the summary, and the more rapid it's transmission to the next point of care, the more likely patient care is improved, and potential for adverse events is reduced.

The NUH Trust, as part of the drive towards improving the quality and safety of care, is moving towards electronic documentation of patient information. NUH Hospital Departments have used a variety of methods to complete these summaries in the past, and are now moving towards using electronic systems, in the view that electronization will improve rates of completion and transfer of information.

In view of the complexities of using this form of communication and the changes being introduced, this study aims to understand the views of Primary Care Physicians as the direct recipients and users of these discharge summaries.

Study Objectives: The interviews conducted will support the research study in that they will assist the researcher in:

- Establishing the views of the general practitioner in terms of current and previous process and practice in the receipt and usage of the discharge summary and the quality of the information contained therein.
- Determining the types of discharge communications used previously, and general practitioner views in terms of advantages and disadvantages.
- Developing a deeper understanding of the complexities of discharge communication.

For inquiries please contact: Haya S. Zedan, MPH, FRSPH

PhD Candidate, Room 1422, D Floor, Division of Primary Care,
Queen's Medical Centre, School of Community Health Sciences,
University of Nottingham, Nottingham, NG7 2UH.

E-mail: mcxhz1@nottingham.ac.uk

4) Interview Schedule

Draft Interview Schedule

Primary Care Formal Structured Interviews with General Practitioners Qualitative Study August- October 2010

Begin interview by thanking them for taking the time to meet with me and an appreciation of their intense schedules. Ask how much time they have today and whether they would mind if I record the session as it helps me keep notes. Reassure them that all recordings are confidential; for my own use and that it will be deleted once I am finished. Hand out the participant information sheet and interview consent form and ask for them to read it and sign both copies. Give a few minutes for this and then thank them.

Introduce myself: *I'm doing my PhD at the University; I'm in my 3rd year, working with Professors Tony Avery and John Gladman. My PhD research is examining the local attempts to improve discharge communication sent from hospital to primary care, and for part of my PhD at the University, I am interested to learn from your experience as a primary care physician in receipt of various types of discharge summaries and on the quality of communication from hospital in general. I would like to ask you a few questions on this topic.*

Q1. How long have you been a practicing GP in the area?

Q2. What is your experience of discharge communications from hospital?

Q3. How has discharge communication changed in recent years?

Q4. How do you typically receive discharge summaries from hospital (hand delivery by patient, fax, post, e-mail)?

Q5. Can you differentiate the type of discharge summary used by the hospital staff (dictated, handwritten, or electronic) when you receive it?

Q6. What is your preferred method of receiving discharge summaries? Or what do you think is the most effective way to get the summary from the hospital to you?

Q7. Would you say that you usually have the patient's discharge summary to hand when you first see the patient after they have been in hospital? Has this occurred recently?

Q8. How would you rate the quality of the information sent through overall?

Q9. What do you see as the most important items that must be present on a discharge summary? How likely is it for these to be present on what you receive?

Q10. Are you aware that NUH is implementing a Trust-wide electronic discharge system at the moment? How do you think it will affect your working practice?

Q11. What suggestions would you give to the hospital for ways in which discharge communications can be improved?

This brings us to the end of our interview today; this has been very insightful for me , to be able to speak with you on this topic today. Thank you very much for your time.

Word Count 57,265