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BARRIERS TO EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER

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A thesis submitted in partial fulfilment of the requirements of
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ABSTRACT

Shift handover is a process during which doctors can exchange information, authority and primary responsibility for patient care. The level of handover standardisation may vary across departments and hospitals, and handover may be affected by the context in which it occurs. If during handover communication doctors do not transfer information pertinent to a patient's care delivery, it may lead to unintended negative consequences.

An explanatory, mixed-methods study, using the principles of critical realism was conducted to investigate whether or not similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic and to develop hypotheses regarding how various individual performance-, work environment- and system-related factors may collectively contribute to ineffective shift handover communication between doctors. In accordance with the principles of critical realism the study included theory-testing phases: (i) a critical review of literature; (ii) a cross-sectional questionnaire survey; and (iii) semi-structured interviews with doctors.

The results of the study show that doctors working in hospitals in the Czech Republic identify similar barriers to effective shift handover communication between doctors identified in hospitals around the world. However, handover between the Czech Republic doctors has its own specific characteristics. The inadequacies of the social, systemic and environmental features that make up different contexts in which handover is conducted collectively contribute to ineffective shift handover communication. For example, a systemic feature (e.g. the absence of training), may lead to specific doctors' beliefs (e.g. handover is meaningless), which in turn trigger certain

behaviours (e.g. doctors go home without communicating either verbally or in writing the work carried out during the previous shift), that tend towards a particular kind of outcome (e.g. the absence of handover). Consequently, the division of barriers to handover into one-dimensional categories such as 'the individual performance', 'the system' or 'the social environment', has emerged as superficial as it does not adequately reflect the reality of the context and process of handover communication. Any interventions and programmes, which aim to enhance communication between doctors at shift handover, may need therefore to address the multidimensional nature of handover communication.

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Most importantly, I would like to thank my family, including my husband Nishit Shah and my parents, Czeslawa and Krzysztof Szalaj. No words can express what their support has meant to me.

Finally, I would like to dedicate this thesis to my grandmother Katarzyna Knapik who is no longer with us but whose faith in me has given me wings.

CANDIDATE'S STATEMENT

I declare that, except where indicated by specific reference, the work submitted is the result of my own investigation. No portion of the work presented in this thesis has been submitted in substance for any other degree or award.

Katarzyna Karolina Machaczek

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CHAPTER 1 INTRODUCTION

1.1 BACKGROUND AND RATIONALE BEHIND THE PRESENT STUDY

Shift handover is a process during which doctors can exchange information, as well as exchange authority and primary responsibility for patient care (Stiell, Forster, Stiell and van Walraven, 2003). The level of handover standardisation varies across departments and hospitals; as a result, handover is affected by the context and circumstances in which it occurs. A survey of doctors working in hospitals in Australia by the Agency for Healthcare Research and Quality (AHRQ) found that 49% of respondents believed that important patient-care information is 'lost during shift changes' (The Joint Commission, 2004).

If during handover doctors do not transfer information pertinent to a patient's care it may lead to adverse events (Vidarthi, Arora, Schnipper, Wall and Wachter, 2006; Stevens, 2008), that is, unintended negative consequences of a medication or treatment. Indeed, evaluations of the root causes of adverse events have revealed that current communication practices within hospital, including shift handover, trigger or contribute to more than 70% of such events (WHO, 2007). Another evaluation of handover practices in 28 Australian hospitals revealed that communication errors, including omissions of information, had led to twice as many preventable deaths as had clinical mistakes (Wilson, 2011). In one study 56.9% of handovers during which residents (doctors in training) did not transfer information pertinent to a patient's care, resulted in delayed communication with inpatient units or delayed and/or missed therapy; many led to adverse events (Vidarthi et al., 2006). While this provides sufficient evidence for exploring shift handover, the next part of the chapter discusses barrier to effective shift handover

communication between doctors identified outside of the Czech Republic, since no account has been found of research on handover in the Czech Republic.

1.1.1 INTERNATIONAL CONTEXT

Numerous primary studies (Arora, Manjarrez, Dressler, Basaviah, Halasyamani and Kripalani, 2009; Bump, Jovin and Destefano, 2011) have investigated barriers to effective shift handover communication. These have been collated in a systematic review that identified 91 barriers related to 140 handover strategies or methods of enhancing a handover process (Riesenberg, Leitzsch and Little, 2009). The barriers to handover can be classified into three major categories: the performance of individuals, the work environment and the system factors. We shall consider these in turn:

I. Individual performance: Individual performance-related barriers include lack of clinical capabilities, experience and expertise, and lack of communication skills (Borowitz, Waggoner-Fountain, Bass and Sledd, 2008). Furthermore, with regard to individual-performance related factors arising from experience, expertise and the length of employment, doctors with different types of expertise (specialisation) and work experience may have different expectations of which and how much information should be conveyed during handover; for example less experienced doctors (juniors) may convey different information during handover than more experienced doctors (experts) (Bruce and Suserud, 2005). Or, experts may fail to transfer enough clinical information for juniors to understand a patient's case (Sutcliffe, Lewton and Rosenthal, 2004).

Lack of communication skills may also negatively affect handover; for example, doctors may not use any methods to enhance the effectiveness of

communication such as repeating information to ensure it has been understood, asking questions or providing feedback (Behara et al., 2005).

Furthermore, hospital work is hierarchical and both formal and informal authority structures may affect work practices. A handover discussion, therefore, is likely to involve exchanges of 'power', that is, the ability to affect others to follow one's decision (Mintzberg, 1979). Exchanges of 'power' may be relevant to the present study since hospitals are dominated, or at least affected, by medics. Lack of communications skills may reflect the absence of training in how to communicate effectively at shift handover.

II. Factors related to the work environment: Another group of factors that has been found to have an impact on shift handover communication relates to the physical environment. Environmental obstacles to handover include high background noise levels (Borowitz et al., 2008), sometimes resulting in interruptions (Solet, Norvell, Rutan and Frankel, 2005); and, lack of a designated space (Jauhar, 2008; Riesenbergl, 2009).

III. Factors related to the system: System-related barriers to handover include lack of time (Pezzolessi et al., 2010), lack of standardisation, standard and/or structured methods for conducting handover (Nagpal et al., 2012), and, insufficient technology support for handover communication e.g. electronic records (Petersen, Orav, Teich, O'Neil and Brennan, 1998).

Furthermore, essential clinical information for a patient's care delivery e.g. laboratory tests results may be unavailable at the time of shift handover communication (Vidyarthi, 2006).

To date, there has been no published evaluation of handover practices in the Czech Republic, nor has there been a study investigating barriers to effective shift handover communication between doctors.

1.1.2 THE CZECH REPUBLIC CONTEXT

The current hospital environment in the Czech Republic presents challenging conditions in which effective shift handover communication between doctors may be compromised. These conditions include lack of resources, heavy workloads and administrative burdens imposed on staff (Elash, 1999). The volume of documents doctors are required to complete during their working hours has significantly increased over the last few years. This can be partially attributed to the fact that in 1999 the Czech Republic government accepted international standards for healthcare organisation accreditation. Heavy workloads and limited resources led to doctors' strike action in 2010, and in 2012 unions threatened another round of strikes. The relevance of heavy workloads here is that they may limit the amount of time doctors devote to non-clinical activities such as shift handover.

The present study was motivated by a drive to evaluate handover practices, improve communication between doctors at shift handover, establish reporting systems for adverse events, as well as to develop programmes to improve patient safety within a patient safety culture. The unique features of safety culture include safety climate, safety behaviour and safety management (Johnstone, 2007). Safety climate refers to psychological factors of safety such as staff's commitment to safety (Johnstone, 2007). Safety behaviour relates to behaviour while completing daily, routine tasks (Johnstone, 2007). Safety management describes systems and subsystems designed to improve patient safety (Johnstone, 2007). The patient safety culture, similarly to a human factors approach, focuses on an open flow of information and exploring and learning about and from the vulnerabilities within systems (Ross, 2009). Safety climate focuses on the members of the organisation and their experiences and perceptions of the environment within which they work (Ashkanasy, Wilderom and Peterson, 2011). Common features of organisational culture include "enduring multilevel, organized

work context entailing the following: organizing values, norms, taken-for-granted assumptions behavioral regularities, rituals, practices, procedures, patterns of discourse, use of symbols, ways identity is constructed, and so on." (Ashkanasy, Wilderom and Peterson, 2011, p.5). The familiarisation stage of the present study suggested that a blame culture exists in hospitals in the Czech Republic. According to the human factors approach, organisations where a blame culture prevails foster a culture of perfection in which there is zero tolerance for errors; such organisations are unlikely to create a supportive work environment (Vincent, 2010, p.142).

Outside the Czech Republic, various methods and strategies such as checklists have been implemented to improve the effectiveness of communication, including the effectiveness of transferring information during handover (Petersen et al., 1998). However, not all of these interventions have been preceded by investigations into barriers to conducting handover within the system in which they were implemented (Behara, Wears, Perry, Eisenberg, Murphy and Vanderhoef, 2005).

1.1.3 THE RESEARCHER'S BACKGROUND

In 2010 I was supporting the development of 'A Patient Safety Programme - Saving Patients from Harm', for sixteen hospitals across the Czech Republic. The Saving Patients from Harm Programme was a Government Programme aiming at improving the safety of patients in Czech hospitals. The Programme was an initiative of the Project Hope. The Project Hope is an international charity which aims to strengthen healthcare systems across the globe through, for example, providing medical training, and supporting healthcare organisations in establishing best and safety clinical practice. The primary objective of the Patient Safety Programme was to develop a hospital system for identifying, reporting, addressing and learning from adverse events, as well as to prevent their reoccurrence.

My academic background is in Public Health and Health Services Research (HSRs). I graduated with a master's degree in Public Health in 2004 and got involved in different research projects focusing on health promotion initiatives, some of which included evaluation of health services in the Czech Republic, Poland and the UK. The research I have been involved in has offered a strong foundation and understanding of the context of healthcare provision, hence I was approached to develop bespoke modules for the 'A Patient Safety Programme - Saving Patients from Harm'.

The preparations of the module involved discussions with doctors and other healthcare providers working in hospitals in the Czech Republic about problems they face. During the discussions it became apparent that shift handover communication presented a significant barrier to effective work in hospital departments in the Czech Republic. Since I was previously involved in a study in the UK around exploring A&E doctors' perceptions of barriers to effective handover, I decided to undertake a PhD study around barriers to shift handover communication.

As a non-clinician I was an outsider when the present study began. Paradoxically, however, I felt that being 'an outsider' to the medical profession and the system, encouraged openness; this became evident during data collection, especially interviews with doctors. Kirkumura (1998) posits: *"On the one hand, advocates for the outsider perspective generally argue that access to authentic knowledge is more obtainable because of the objectivity and scientific detachment with which one can approach one's investigation as a nonmember of the group. On the other hand, proponents of the insider perspective claim that group membership provides special insight into matters (otherwise obscure to others) based on one's knowledge of the language and one's intuitive sensitivity and empathy and understanding of the culture and its people."* (p. 140-141).

The consideration of those two concepts, an outsider and insider, when designing and undertaking social research seems to come down to 'who should (may?) do research on whom' (Rabe, 2003). Can a non-member of the group provide meaningful insights into the experiences and perceptions of the members of the group? Can I, as an outsider to a medical profession, someone who speaks a different first language and works in academia, conduct a meaningful piece of work on doctors' experiences and perceptions of barriers to conducting shift handover in the Czech Republic? Bearing in mind both the obvious and other plausible differences between doctors and myself I preceded the study with the familiarisation stage, during which I explored the feasibility of investigating and reporting barriers to shift handover and the likelihood of establishing a good rapport with Czech doctors (the details of the Familiarisation Stage are described in Section 3.5.1). The familiarisation stage revealed that doctors were interested in being involved in a study investigating barriers to handover and happy to share their experiences and expertise. Although, as a non-clinician I was an outsider when the present study began, however, paradoxically I felt that being 'an outsider' to the medical profession and the system, encouraged openness; this became evident during data collection, especially interviews with doctors.

1.1.4 LANGUAGE

The present study included two data collection phases, a cross-sectional questionnaire survey and semi-structured interviews with doctors. The questionnaire survey was developed in English and then translated to Czech by a translator who had signed a confidentiality agreement. The sworn translator was employed by the Project HOPE and therefore she had a good knowledge of health services, healthcare professionals and the context of the study. In addition, during a pilot study doctors back translated questionnaire items into the source language (English) (Ercikan, 1998).

According to (Vulliamy, 1990) the quality of translation is affected by a number of factors such as the researcher-translator's knowledge of both, the culture and language of the individuals under study. The researcher-translator was familiar with both the culture and the language of doctors as she had been involved in delivering projects in the Czech Republic.

Interviews were conducted in either English or Polish. Interviews in Polish were possible as in a region where the study was conducted (Hospital 1) many doctors were fluently Czech/Polish bilingual as this part of the Czech Republic has a large Polish speaking community. Many of its citizens have attended Polish schools; in addition some doctors graduated from Polish medical schools. Doctors interviewed at Site 2 were fluent in English as the Site was a large city University hospital. To eliminate translation-related issues an interview schedule in English was pilot tested with one doctor. Furthermore, as the present study focused on the handover process, language used to convey knowledge of the subject was technically constrained and hence, it was not particularly idiomatic. As such, close cultural knowledge was less important than in, for example, a study of humour or attitudes.

1.1.5 ETHICAL IMPLICATIONS

The study raised a standard set of ethical issues that could be dealt with in a conventional way, such as ensuring data security and participant confidentiality (see Section 3.4). However, there was a specific issue relating to working as an 'outsider' researcher (see Section 1.1.3) and that is described in the literature (Allmark et al., 2009). This was that it was likely that the interviews would reveal some practice that was substandard. In such cases I would be divided between an obligation to protect confidentiality of sources and one to protect the public from poor care. In order to deal with this I made a distinction between problems that were cultural and structural

and those that were cases of wanton neglect or malpractice. Pre-emptively, I made clear to participants that the study report would not identify individuals except in cases of the second type. In the event, although the research identified many problems of the first type, cultural and structural, no such issues of the second type were uncovered and hence no occasion arose to take further action. There was also an issue of interview conduct here. The topic of concern in the interviews was fairly specific, the conduct of handover. However, there is sometimes a possibility that semi-structured interviews stray into new territory that wasn't anticipated and interviewees reveal things they wish they had not (Allmark et al., 2009). In this regard I relied on my experience as a qualitative researcher to keep the focus fairly sharp and, again, no such issue seemed to arise.

1.2 THE AIM AND OBJECTIVES OF THE STUDY

The overarching aim of this study was to develop a new theoretical position, hypotheses, on how various factors and mechanisms may collectively contribute to ineffective shift handover communication between doctors working in hospitals in the Czech Republic. As well as this broad aim, the study had three objectives:

- I. Using the principles of critical realism, to investigate whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic.
- II. To identify the Czech Republic doctors' experiences and perceptions of the key barriers to effective shift handover communication.
- III. To explore the Czech Republic doctors' experiences and perceptions of the causes of barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic.

1.3 THE METHODOLOGICAL STANCE DEPLOYED IN THE PRESENT STUDY

This section introduces critical realism, the philosophical approach that guided the conduct of the present study. Critical realism is then discussed in depth in Chapter 2. The purpose of this section is to briefly explain how critical realism affected the roles of different phases of the study and the order in which different chapters are presented in this thesis.

CRITICAL REALISM ONTOLOGY

In terms of the ontological dimension, critical realism posits that the world is independent of human's perception of it (Collier and Bhaskar, 1994). Critical realism divides empirical reality from Pure Reason; it merges metaphysical, metaphorical and realist propositions, to explain what the world must be, above and beyond individuals' experiences (Jefferies, 2011). It posits that phenomena have internal mechanisms, and structures, which can be triggered and actualised by various factors (Bhaskar, 1975; Collier and Bhaskar, 1994). In contrast to alternative theoretical positions, such as positivism and constructivism, critical realism aims to explain events, through getting beneath the surface of what 'appears to be', in order to understand the mechanisms which cause events to emerge (Bhaskar, 1975; Collier and Bhaskar, 1994). Therefore, critical realism provides an approach from which to understand the fundamental causes of events.

CRITICAL REALISM EPISTEMOLOGY

With regard to epistemology, critical realism posits that whilst the external world is real and exists independent of our perception of it, our knowledge of that external world is socially constructed through attempts to understand and control it (Collier and Bhaskar, 1994). Scientific method has shown itself to be one of the best ways of constructing a fairly accurate picture of the

external world, but it is always fallible and subject to change in the light of future discoveries (Collier and Bhaskar, 1994).

The key feature of a critical realist investigation is that it is a theory-led approach. Because of its epistemological position it sees the start of a research enquiry as one set of theoretical positions which explain a phenomenon to be tested, and the end of a research enquiry as a new, better theoretical position (Collier and Bhaskar, 1994). That is, a critical realist investigation commences with a set of hypotheses, which are then tested throughout the study, and the main outcome of the investigation is a new theoretical position, a number of hypotheses, from which new studies shall begin. How has this affected the conceptualisation and conduct of the present study?

HOW HAS CRITICAL REALISM AFFECTED THE CONDUCT OF THE PRESENT STUDY?

The initial hypotheses to be tested throughout the study were established during the conceptualisation stage and included a cherry picking review of literature, the review of the researcher's previous work on handover and familiarisation with shift handover practices in hospitals in the Czech Republic. The initial hypotheses are set out in section 1.4.

To test the initial theories, the design of this study took the form of the three theory-testing phases (Phase I-III). The first phase (Phase I) was led by the initial theories with which the study began and consisted of testing those theories and developing new ones through a critical review of primary studies on barriers to effective shift communication between doctors. That is, in the present study the critical review of literature was a component of a theory-led methodology. This is in contrast to social science investigations guided by other theoretical positions, such as constructivism or positivism, where the purpose of a literature review is to identify gaps in the existing knowledge

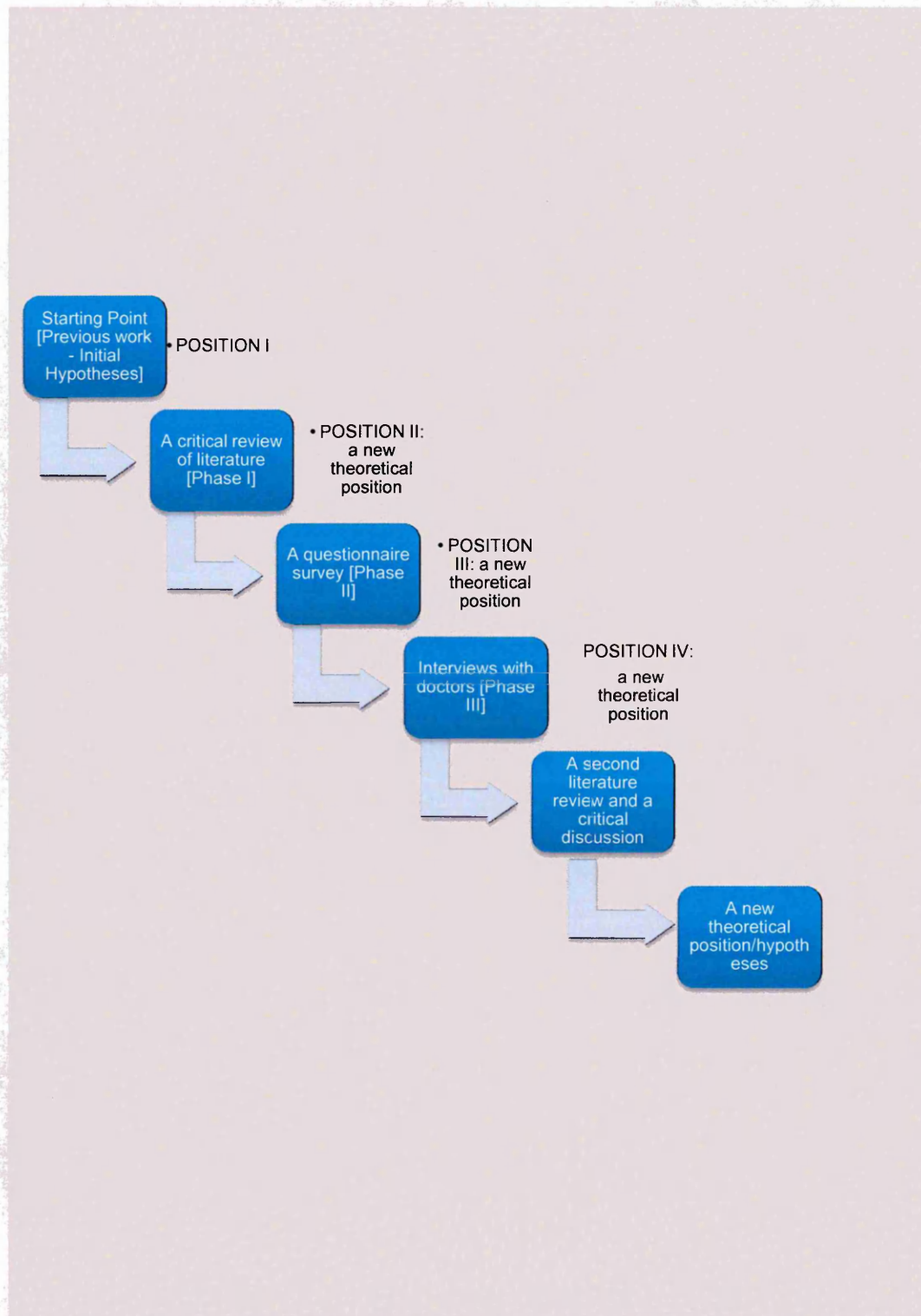
rather than to act as a theory-testing component of the study (as is the case with critical realism). Therefore, in this thesis the methodology chapter precedes the literature review chapter.

The second phase (Phase II) was led by the theories established through the critical review of literature and consisted of testing those theories and developing new ones through a quantitative method, a questionnaire survey, which explored whether or not similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic, and to explore the Czech Republic doctors' experiences and perceptions of the key barriers to effective shift handover communication.

The third phase (Phase III) was led by the theories established through the questionnaire survey, and consisted of testing those theories and developing new ones through a qualitative method, semi-structured interviews, which explored doctors' experiences and perceptions of the causes of the key barriers to effective shift handover communication. This new theoretical position was subject to interpretation in the light of relevant literature including discussion papers and good practice guidelines for doctors on how to communicate effectively at shift handover.

That is, in total, there were three iterations of the initial hypotheses resulting in the establishment of a new theoretical position, a number of hypotheses, on barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic. Graph 1.1 provides a visual representation of theory-testing phases included in the present study.

Graph 1.1 Phases of the present study



1.4 THE INITIAL HYPOTHESES

INITIAL HYPOTHESES
<p>(1) INDIVIDUAL-RELATED BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS</p> <p>Lack of capabilities e.g. difficulties in recognising which information is essential for the delivery of a patient's care.</p> <p>Lack of experience e.g. handover involving junior doctors.</p> <p>Lack of communication skills (e.g. doctors do not use any strategies to enhance the effectiveness of communication such as asking questions, providing feedback, repeating the key information to ensure that it has been accurately understood).</p> <p>Handover involving junior and senior doctors (as doctors with different work experience may have different expectations as to what should happen during a shift handover meeting; also, handover involving junior and senior doctors may be affected by differences in doctors' status).</p> <p>Disagreements over a medical diagnosis.</p> <p>Interruptions by a handover participant.</p> <p>(2) THE SYSTEM AND ENVIRONMENT- (PHYSICAL ENVIRONMENT)-RELATED BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS</p> <p>High background noise level (e.g. due to busy periods in the department and/or hospital).</p> <p>Interruptions from people not directly involved in handover.</p> <p>Lack of a designated handover space.</p> <p>Lack of time.</p> <p>Handover is unstandardized.</p> <p>Handover log or another structured protocol is not used.</p> <p>The key topics to be included in handover discussion are not defined.</p> <p>Relevant patient documentation is missing</p> <p>Essential clinical information for a patient's care delivery is unavailable at the time of handover e.g. tests results are unavailable.</p> <p>Lack of training in how to communicate effectively at shift handover.</p> <p>Insufficient Information Technology (IT) support.</p>

1.5 TERMINOLOGY: BARRIERS, HYPOTHESES AND THEORY

Three terms used throughout the thesis require some explanation in the light of the approach used: barriers, hypotheses and theory. A realist approach in social science is standardly used where a complex network of factors results in phenomena that are puzzling and require explanation. In this thesis the puzzle is that i) the goal of handover is to ensure that those taking on responsibility for a patient's medical care are given all relevant available information; ii) effective handover can occur as evidenced by the fact it often does; iii) ineffective handover also occurs, evidenced in the same way; iv) it is not usually known (or transparent) why ineffective handover occurs despite general agreement on point i), its goal. This situation, where something works in some social contexts but not others is a classic starting point for realist research. Hence, in this thesis, the term 'barrier' relates to those hidden factors that prevent effective handover.

A realist approach is theory-led. This reflects a view of science as being a process of positing theories, testing them, then reaching a new theoretical position in the light of those tests. This contrasts with a view of science as a process of positing theories and then establishing them as true or not. In any study of this type there will be initial ideas as to the causes of success and failure - these can be gathered through anecdote and imagination. They can then be tested and developed through, for example, a critical survey of the literature; this leads us to a new theoretical position. This position can in turn be tested further through, for example, empirical work such as surveys and interviews. Throughout this process, it is ideas or theory about causes that leads the way. This contrasts with a data-led approach in which, for example, data is gathered and then theory emerges or is developed from the data. As such, the term 'theory' in this thesis has this specific realist nuance.

A similar point relates to the term 'hypothesis' which in the realist theory-led approach is almost interchangeable with theory, although it sometimes indicates theory on a small scale rather than a large one. But again, the realist nuance is that hypotheses are the beginning and endpoint of the approach rather than only the beginning, as in, say, a more positivist account. Realist hypotheses often take a Context-Mechanism-Outcome form, as discussed in the next chapter.

1.6 THE OVERVIEW OF THE THESIS

The thesis comprises seven chapters. Chapter 2 provides the details of the methodology employed in the present study - critical realism. The chapter also briefly describes the principles of alternative philosophical traditions, positivism and constructivism, and the rationale for not adopting them in the present study.

Chapter 3 presents research methods used to answer the research questions addressed in this study.

Chapter 4 provides the details of the first theory-testing phase of the present study, a critical review of literature on barriers to effective shift handover communication between doctors. The purpose of the critical review was twofold: (1) to explore and test initial hypotheses about barriers to effective shift handover communication between doctors through identify types and causes of barriers to effective shift handover communication identified through primary studies conducted around the world; and, (2) to inform the development of a questionnaire survey that formed a basis of theory-testing Phase II.

Chapter 5 describes the details of the second theory-testing phase of the present study, a questionnaire survey with doctors. The overall aim of the

quantitative Phase II was to further test hypotheses, which were taken forward as plausible from Phase I. The Phase had five objectives: (1) to investigate whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic; (2) to identify doctors' experiences and perceptions of the key barriers to effective shift handover communication; (3) to identify which factors perceived by doctors as barriers to effective shift handover communication were statistically significant; (4) to identify which barriers to effective shift handover communication between doctors were identified by more than 70% of respondents; and (5) to identify any statistically significant correlations between factors (variables) perceived by doctors as barriers to effective shift handover communication, that is, correlations illustrating tendencies and patterns in which those factors (variables) may collectively contribute to ineffective shift handover communication.

Chapter 6 presents the details of the third theory-testing phase of the present study, semi-structured interviews with doctors. The purpose of the qualitative Phase III was to further test hypotheses, which were taken forward as plausible from Phase II through examining doctors' experiences and perceptions of the causes of the key barriers to effective shift handover communication. Furthermore, Phase III explored doctors' experiences and perceptions of the role(s) and importance of shift handover communication.

Finally, Chapter 7 discusses the key findings from the present study and presents the new theoretical position reached at the end of the study. This takes the form of a number of hypotheses on how various factors, mechanisms and structures may collectively contribute to ineffective shift handover communication between doctors. Chapter 7 also discusses: what difference using the principles of critical realism made; the limitations of this research, including the quality of a mixed-methods approach adopted in this

present study. Finally, the chapter concludes with recommendations for handover practice, patient safety policy, and, for future research.

CHAPTER 2 METHODOLOGY

2.1 INTRODUCTION

This methodology chapter has eight aims:

- 1) To present the research questions being addressed in the present study (Section 2.2).
- 2) To describe a distinction between research methodologies and methods; to briefly discuss: (i) why discussing research methodology underlying a research study is important, and (ii) which research methodologies have been prevailing among Health Services Research (HSR) (Section 2.3).
- 3) To briefly introduce realism (Section 2.4).
- 4) To present early forms of realism, naïve/direct and indirect realism and discuss why those were displaced by positivism and constructivism (Section 2.5).
- 5) To briefly discuss the basic principles of alternative philosophical traditions, positivism and constructivism and to present problems with those approaches which affected the researcher's decision to adopt a critical realist approach in the present study, that is, present reasons for not using positivism and constructivism (Section 2.6).
- 6) To present the basic principles and relevance of critical realism (CR) – a philosophical tradition adopted in the present study, drawing mainly on the work of Bhaskar and Collier; also, to distinguish between natural and social world realism, and to describe how some of the

challenges to realism have been tackled recently, under a new label 'critical realism', in a way which creates a credible alternative to positivism and constructivism in both the natural and social realms (Section 2.7).

- 7) To briefly discuss compatibility of critical realism with research methods and to describe how critical realism guided both, the conceptualisation of barriers to effective shift handover communication between doctors and the conduct of the present study (Section 2.8).
- 8) To illustrate how the present study would have looked if it would be led by different research traditions: critical realism, positivism and constructivism (Section 2.9).

2.2 THE RESEARCH QUESTIONS

The overall aim of this study was to establish a new theoretical position, hypotheses, on how various factors and mechanisms may collectively contribute to ineffective communication between doctors at shift handover. This aim included addressing the following research questions:

- I. Are similar barriers to effective shift handover communication between doctors identified in hospitals around the world, identified by doctors working in hospitals in the Czech Republic?
- II. What are the Czech Republic doctors' experiences and perceptions of the key barriers to effective shift handover communication?
- III. What are the Czech Republic doctors' experiences and perceptions of the causes of barriers to effective shift handover communication?

2.3 METHODOLOGY VERSUS RESEARCH METHODS

Although the term 'methodology' is sometimes used synonymously with 'method' it is also commonly used to mark a useful difference. The methodology is the philosophical stance adopted by researchers in a scientific study; the method is the set of tools used by the researchers in exploring a phenomenon or phenomena (Rossman and Wilson, 1985a). Specifying a philosophical stance employed in a study is important as it represents the researchers' beliefs about how the world works and how they can acquire knowledge of that world (Clough and Nutbrown, 2007). That is, it represents the researchers' interferences about the nature of the reality (ontology), as well as their attempts to comprehend this reality (epistemology). Consequently, the methodology determines the conceptualisation of a topic and the conduct of a research inquiry; i.e. it provides a justification for employing chosen research methods (Rossman and Wilson, 1985a) and it determines the conduct of a study: "a good methodology is more a critical design attitude to be found always at work throughout a study, rather than confined within a brief chapter called "Methodology" (Clough and Nutbrown, 2007, p 31).

Positivism, constructivism and realism are the main research methodologies prevailing among Health Services Research (HSR). The critical review of literature on handover in healthcare organisations conducted for the purpose of the present study, which is presented in Chapter 4, revealed that previous studies used qualitative, quantitative and mixed-methods approaches. However, the research methodology was not explicitly stated in any of them, although they were broadly in the most common current traditions of positivism or constructivism.

The present study employed a critical realist approach and the next section briefly discusses the key principles of a critical realist ontology and

epistemology. Critical realist approach will be discussed in detail in Section 2.7.

2.4 CRITICAL REALISM

Realism in various forms was probably the first methodological approach to science. However, because of numerous problems with this approach, which are briefly described below, it was subsequently replaced by positivism and constructivism (Ladyman, 2002). Some of these problems, which led to the rejection of realism, have been recently tackled by the work of a British philosopher, Roy Bhaskar; whose notion of realism, under a new label 'critical realism', has created a credible alternative to positivism and constructivism. While critical realism will be discussed in detail in the next section (2.5), here we briefly discuss what philosophical traditions came before critical realism. The purpose of presenting those philosophical traditions is to describe a wider philosophical context within which the present study is located.

2.5 WHAT CAME BEFORE CRITICAL REALISM?: NAÏVE/DIRECT AND INDIRECT REALISM

The following section presents a brief account of naïve realism, and discusses the problems with this approach leading to its rejection as a reliable philosophical stance, and its displacement by positivism and constructivism.

2.5.1 NAÏVE/DIRECT REALISM

Naïve realism, also known as direct or common sense realism, is the theory of perception that posits that our senses enable us to access the external world directly, as it really is; that is, when we see a tree with green leaves

that is because there is a tree with green leaves in front of us. The key problem with this is that what we perceive is a function of our perceptual abilities and beliefs as well as what is actually there (DeWitt, 2011). That is, all individuals are unlikely to perceive the world in the same way, as experiences of human consciousness can differ and different individuals can perceive the same thing differently. And no individual, no matter how well equipped, can perceive the whole world in its true form - for example, see a tree as it is both to humans, bats and every other perceiving creature. This means that the function how we perceive the world represents who we are as well as what the world is.

For example, we see green leaves because our perceptual equipment is set up to register green when in the realm of light waves of a certain frequency (Giere, 2009). The same is true for what we hear, smell, touch and taste. A bat lives in the same world as us but perceives it completely differently. Similarly, individuals can differ; someone might be deaf, or colour blind, for example (Giere, 2009). By contrast, there are individuals who have exceptionally acute sense - some women have four cones instead of three in their eyes and thus see a richer colour world than most people (Giere, 2009). People whose brain is disrupted by chemical disturbances, such as drugs, might perceive a large man in a green coat rather than a tree. In addition, the same individual can perceive the same thing differently at various moments in time; for example, an object, such as a tree, looks different during the day and at night. Therefore, naïve/direct realism was dismissed as a philosophical tradition underlying scientific investigations, and replaced by indirect realism, which is briefly described below.

2.5.2 INDIRECT REALISM

Indirect realism was the prevalent philosophy until the Age of Enlightenment and it is seen, for example, in the work of Aristotle and Galileo and many in

between. Indirect realism introduces a notion of humans being able to access 'an appearance' rather than a real object and what we perceive directly are appearances (Ladyman, 2002). Indirect realism introduces the possibility of moving beyond the immediate experience to say that there is the world that posits unperceived, the world that is the basis of our experience. This notion of a world beyond the one we actually experience is sometimes called the Metaphysical Thesis because it seems to refer to a realm that is beyond the everyday physical one.

Furthermore, indirect realism posits that we are constrained in what we can see and perceive by the beings we are but that a scientific method gives us a true account of the world as it is and why it seems to us as it does. That is, the scientists are aware of their limitations but they can explore and describe how the world operates through using their senses and asking the question: 'How the world must be given its effects on us?'

In broad terms, when we compare naïve/direct and indirect realism, a distinction between them is that according to naïve/direct realism we can perceive objects directly, for example, we can perceive an apple itself, in contrast, according to indirect realism, we can perceive/access immediately the appearance of an object, e.g. an appearance of an apple, our mental representation of it (Lacewing, n.d.).

Indirect realism manages to hold on to the common sense of naïve realism but is not subject to the same obvious problems. As such, the approach largely prevailed until positivism came along. However, indirect realism nonetheless ran into political and philosophical problems. An example of this is Galileo's dispute with the Catholic Church. Galileo posited a heliocentric universe (where the Earth revolves around the Sun); the Church doctrine was a geocentric one (the Earth is the centre of the universe and the Sun and planets revolve around it). However, the Catholic Church was content to

accept Galileo's theory as instrumentally useful, for example, to predict the movements of the stars. However, Galileo wanted to insist on more, that is, that his theories were true, that is, that the universe really was heliocentric.

Aside from political problems with the Catholic Church there were also other, philosophical problems with indirect realism, which led to its decline in the 20th Century. Comte was an early critic, coining the term 'positivism' in the process. Comte's objection to realism was its reliance on metaphysics; something he felt had no place in scientific methodology (Ladyman, 2002). Comte and positivism is discussed below. However, two particular philosophical problems were crucial in the decline of realism: these are: (i) The Underdetermination of Theory by Data (UTD) and, (ii) Pessimistic Induction (PI); we shall discuss them in turn below.

2.5.3 THE UNDERDETERMINATION OF THEORY BY DATA (UTD)

The Underdetermination of Theory by Data posits that a number of conflicting theories and hypotheses are likely to be compatible with the data/evidence and that predictions cannot be derived from the evaluation of a single hypothesis in isolation from anything else. Furthermore, the results of a scientific investigation cannot prove that a given theory is correct and the other ones are not (DeWitt, 2011, p. 48-49). Consequently, "crucial experiments", that is, experiments which would allow scientists to find out which of the available theories is accurate, do not exist (Duhem, 1954-1906) (DeWitt, 2011). That is, if there are two conflicting theories, a crucial experiment should show at least one of them to be incorrect (Hooke, 1635-1703) (Ladyman, 2002, Kindle location 572). However, since confirming data can exclusively support, rather than accept a hypothesis as true, crucial experiments are implausible (Kevin Bacon's "confirmation reasoning").

This argument is supported by the notion of auxiliary hypotheses. Whenever an experiment is carried out or data are interpreted, the researcher makes assumptions that can be called auxiliary hypotheses (DeWitt, 2011). For example, one assumption might be that the equipment was not faulty, or that the researcher did not make up the data. Other assumptions apply to the reasoning processes used in statistics, mathematics and logic. It follows that crucial experiments cannot be used to exclude one of the conflicting theories as if the results of an experiments, that is, the data, disconfirm the main theory, it is always plausible to reject auxiliary hypotheses rather than the main theory (DeWitt, 2011, p. 47-48). That is, hypotheses and theories are not rejected/accepted in isolation; they are accepted and rejected together with other hypotheses and theories (DeWitt, 2011). Therefore, if evidence does not support a theory, it is difficult to establish whether the problem is within the theory or with one or more of the auxiliary hypotheses (DeWitt, 2011).

With respect to The Underdetermination of Theory by Data and realist assumptions about reality, if there are numerous incompatible theories about the reality, especially those describing aspects of reality which cannot be observed by us, then how can we decide which one of them shall be accepted as the correct one? That is, each hypothesis possesses verifiable opponents, which agree regarding what we can observe, but disagree about the unobservable (DeWitt, 2011). Which hypotheses, then, shall be perceived as being 'underdetermined' by data? The further question that emerges is: 'How can we be certain about any theories arising from realist investigations?' and we cannot possibly answer this question referring exclusively to the principles of less naïve/direct or indirect realism, and this partly explains the decline of realism.

The Pessimistic Induction, described briefly below, is another philosophical problem that was crucial in the decline of realism.

2.5.4 THE PESSIMISTIC INDUCTION (PI)

The Pessimistic Induction (PI) posits that because every scientific theory in the past has eventually been overtaken by a different scientific theory, every new theory will be overtaken by a different one (DeWitt, 2011). That is, any theories currently believed to be true will eventually be overtaken. It follows that what we think of as knowledge is actually a flawed theory that will be superseded (DeWitt, 2011). Both, naïve/direct and indirect realists failed to defend their position against arguments presented by the Pessimistic Induction (PI).

2.5.5 FURTHER PROBLEMS WITH REALISM

Alongside these purely philosophical problems, there were issues in scientific investigation, particularly physics, which created problems for realism; we shall discuss them below.

The first account of the Universe being governed by regular laws originated in astronomy (Laplace's determinism - a branch of realism). Scientific determinism posits that if at a particular moment in time, we could comprehend the movement of particles in the universe, it would make it possible for us to determine how the particles would behave, move etc. at other times (Hawking, 2013). That is, according to scientific determinism the particular condition that the universe is in at a given time, determines its state at other times (Hawking, 2013). Furthermore, determinists posited that scientific laws can be deemed to be scientific, exclusively when they are independent of the effects of forces beyond scientific comprehension and/or the laws of the universe, that is, independent of God's will and actions (Hawking, 2013).

However, in the 20th century two scientific developments showed the determinists' notion to be incorrect, these were Quantum mechanics (QM)

(also known as the Quantum Theory), and the Uncertainty Principle (Hawking, 2013). Clearly these theories from physics are beyond the realm of this thesis. However, what matters here is that both raise important problems for realism.

Realist epistemology seems to require that scientific theory gives at least an approximate account of how the world is; the Chaos Theory, the Uncertainty Principle and the Quantum Theory undermine this epistemology.

To summarise, the Uncertainty Principle and the Quantum Theory suggest that there is no single, true description of the world and that in describing or measuring the world we can affect it. A key idea here is the view of probability: is it a fact in the world (ontology - raising problems for realism) or a fact in our understanding of the world (epistemology - compatible with realism)?

This uncertainty arising from the Uncertainty Principle related to how the Universe works was questioned by Einstein who attempted to defend realism against the problems which suggested that realism was both empirically and philosophically problematic (Kumar, 2009). Einstein claimed that our uncertainty about the universe was temporary (Kumar, 2009). According to him, underlying reality existed and was governed by the universal laws (DeWitt, 2011) and his saying, "God does not play dice" represented his belief that while God can see and understand the reality, it is impossible for us, humans, since our actions and attempts to understand the nature of the reality are weakened/impaired by the quantum nature of the light (Hawking, 2013). Thus, Einstein rejected the idea that the Universe is affected and controlled by probability (Hawking, 2013). This idea that regular laws govern the universe was the key notion of Einstein's Theory.

In summary, there were philosophical and theoretical problems with realism that became apparent from the time of Comte onward. There were also

political problems with the Church that were apparent earlier but which, to some extent, showed that the position taken on realist ontology was one that mattered in some sense. Positivism and constructivism, two major methodological approaches, were developed in response to the decline of realism; and the next section of this chapter (Section 2.6) briefly describes the principles underlying those two approaches.

2.6 PHILOSOPHICAL TRADITIONS AND PARADIGMS COMMONLY USED IN HEALTH SERVICES RESEARCH (HSR)

Constructivism and positivism are two research paradigms prevailing among Health Services Research (HSR) (Williams and May, 1996a); we shall discuss them in turn below.

2.6.1 POSITIVISM

The term positivism was coined by Auguste Comte (1798 - 1857). Comte viewed positivism as the modern, scientific turn in human thoughts associated with the Enlightenment of which he was a part. He suggested that human thought had gone through three stages of development: theological, metaphysical and positivist (Ladyman, 2002). In the theological stage, the world was explained as the product of supernatural forces, such as gods. In the metaphysical stage, it was explained as being the product of unseen and unobservable forces, such as 'universal laws' and 'moral rights'. This type of reasoning was undertaken in the absence of, or without adequate reference to empirical evidence (Ladyman, 2002). In the positivist stage, human reasoning was grounded in empirical evidence and did not make essential reference to religious or metaphysical forces except as a matter of convenience (Ladyman, 2002). Thus, for example, positivists allowed science to talk of universal scientific laws or of cause and effect but only as instrumental devices for prediction, not as statements of facts about the world (Ladyman, 2002). Thus, Comte's positivism incorporated several features:

1. A hostility to metaphysical explanation. As such it rejected the realist idea of a realm of real objects beyond human experience, and the term 'positivist ontology' is virtually oxymoronic. Positivists deny the meaningfulness of

metaphysics so therefore deny that a statement such as 'there is a real realm of objects beyond human experience' is meaningful.

2. An emphasis on prediction over explanation in science. For positivism, the importance of science lays in its ability to predict and control the world. The explanation of the world in terms of, for example, universal laws was simply a convenient model by which this prediction and control could occur.

3. An empiricist epistemology - in other words, everything humans know is ultimately a product of what they experience or could experience. In logical positivism this took the form of saying that statements were either: i) empirically verifiable (e.g. it is raining); ii) tautological (e.g. all not married men are bachelors); or, iii) meaningless (e.g. there is a force that controls the world but which can never be sensed by man).

With regard to eliciting knowledge of the unobservable, positivism posits that we are incapable of doing so. Therefore, investigations in the positivist tradition are limited to exploring the empirical domain and do not facilitate exploring anything like so called other layers of reality which represent the underlying structures and mechanisms which generate events but which are unobservable. Positivism posits that pure data is the basis of knowledge (Chalmers, 1999) and therefore in a positivist tradition a theory is induced from observations of phenomena; for example, observing a kicked ball moving might lead to a theory about how kicking in general causes balls to move.

Causality in positivism is established at the level of empirical experiences, that is, the repeated conjunction of events, such as a ball moving when struck by a foot, leads us to induce that the former causes the latter (Johnson and Gray, 2010); (Hume, 1711-1776). This might be linked to deeper theories about gravity and forces. However, these theories are not to be considered right or wrong because they are about things that are

unobservable except through their effects. Rather they should be seen as useful or not, to the extent that they correctly explain and predict what happens in the observable realm. Positivism shares with constructivism the notion that theories are abstractions and they are useful or not rather than false (Johnson and Gray, 2010). Consequently, all we can know are conceptual constructions, theories and models, which serve more or less useful purpose of explaining the empirical domain (Johnson and Gray, 2010).

Hume (1711-1776), writing before Comte but in the empiricist tradition that the latter inherited, noted an important problem with induction by which repeated conjunctions of events are used as the basis for an inductive conclusion, for example, that a kicked ball will move. That is, according to Hume, statements or theories not linked to past and present are associated with causes and effects (Ladyman, 2002, Kindle location, 708). However, reasoning based on a cause and effect relation does not provide a foundation for truth as future causal relations may differ from the current ones (Ladyman, 2002, Kindle location, 767). Hume perceived causal effects as regularities and correlations rather than laws of the Universe (Ladyman, 2002, Kindle location, 767). Therefore, positivism posits that theories improve by being more useful, explaining a larger amount of a phenomenon, but, as it was previously stated, it has nothing to say about whether these theories are true or not as the problem with inductive reasoning, used by positivists, is that irrespective of how many instances of a phenomenon (an object or an event) we observe, it does not guarantee that our understanding of a phenomenon will be correct (Ladyman, 2002, Kindle location, 776). For this reason, researchers in a positivist tradition prefer to avoid induction and the uncertainty associated with it. As we shall see presently, positivism favours controlled trials (Pawson, 2013). One form of reasoning associated with such trials is hypothetico-deduction in which the investigator is able to deduce on the basis of trial results, that a conclusion can be drawn that

would be true on, say, 95 out of 100 times given those results [this is where $p = 0.05$; where p is the probability of getting certain results, of the occurrence of an event]. We shall return to this point and how hypothetico-deduction raises problems for positivism presently in Section 2.6.3.

Similarly, in social science, a social theory is posited as an instrumental explanation rather than true or not. Two social sciences that are still heavily influenced by positivism are economics and behaviourist psychology. Economics creates models that are known to be based on assumptions that are not supported empirically (e.g. that people are maximising, rational consumers) (Friedman, 2010). But these are justified provided the models can be used to predict and manipulate the economy (Friedman, 2010). In positivist epistemology, models are necessarily unrealistic because they are derived but depart from the empirical realm; and on some accounts the more unrealistic they are the better, as they are merely abstractions that enable the scientist to predict and manipulate things in the empirical realm (Friedman, 2010).

Positivism dealt with the problems such as The Underdetermination of Theory by Data (UTD) and the Pessimistic Induction (PI) by breaking the link between scientific theory and the notion of truth, emphasising instead instrumental usefulness of theories. On such an account, the fact that data underdetermine theory is not a problem because positivism does not require there to be only one true account of the world, just accounts that are more or less useful. Similarly, the Pessimistic Induction is not a problem - as science progresses it will happily let go of theories that are less useful.

The next part of the chapter describes briefly the basic principles of constructivism, that is, the second, after positivism, methodological position that replaced the early forms of realism.

2.6.2 CONSTRUCTIVISM

The term constructivism was coined by Jean Piaget (1896 –1980). Constructivism represents a theory of knowledge. It covers a range of theories that is wider even than the term 'positivism' but there are characteristics of methodology that are described as constructivist. In the first place, constructivist ontology says that in some way or other, the objects in the world are created by humans. There are two major forms of this: social and natural world constructivism (Williams and May, 1996b).

Social world constructivism says that the objects in the social world are created by humans and only exist because of them: money, for example, exists only because people create it and believe it exists. Concepts and ideas are seen as artificial forms, which are utilised as tools for unfolding, understanding, and negotiating the social world (Williams and May, 1996b).

Natural world constructivism says that objects in the natural world also are created by humans and exist only because of them. Typically, this more radical constructivism draws on anthropology to show that humans have constructed the world in widely variant ways and posits that there is not a realm of real objects that exist beyond human activity.

Constructivist epistemology also has some similarities with positivism in that it denies the relevance of truth and explanation. It differs, however, in that positivism gives priority to the instrumental usefulness of theories, whereas constructivism does not. For constructivism, utility is only an important part of a theory if humans have decided that to be so. If a social group explains the world in terms that render it mysterious and unpredictable, as in some fatalist religious explanation, then there is no reason to prefer or reject this approach over one that explains it in terms of, for example, the behaviour of rational economic man, even if the latter is better for predicting and controlling the world.

Constructivism posits that the knowledge we have of the world exists because the researcher exploits the meaning of a phenomenon as perceived by individuals (Patton, 1980). It postulates that all conditions of judgement are dependent upon individual "meaning making" in the given context (Burrell and Morgan, 1979), hence, no single, straightforward explanation or truth about a phenomenon exists and can be objectively described (Lincoln and Guba, 1985). Thus, the value of scientific investigation lies in the way in which researchers construct or make sense of "facts" described by individuals. It is the researcher who selects what to observe, how to interpret it, and, how to disseminate this knowledge to others (Lincoln and Guba, 1985). This multiplicity is at odds with positivism, which prefers the most predictive theory, and even more at odds with realism, which prefers the theory closest to the truth. The theories that people accept are strongly dependent on time, context and cultural site (Chalmers, 1999). Thus, the research process is in a state of flux, there is a constant interaction between the researcher and objects of investigation (Lincoln and Guba, 1985). Consequently, constructivists reject the positivists' perception that "science can generate objective knowledge" which can be generalised across settings and populations (Creswell, 2007).

Constructivism has dealt with the problems of The Underdetermination of Theory by Data (UTD) and the Pessimistic Induction (PI) by denying that there is a reality beyond our perceptions and ideas of it. Constructivism is probably the prevailing methodology in qualitative research and is certainly influential throughout social science (Creswell, 2007).

The next section explains why either positivism or constructivism was not employed in the present study.

2.6.3 REASONS FOR NOT USING POSITIVISM AND CONSTRUCTIVISM IN THE PRESENT STUDY

2.6.3.1 WHY DID POSITIVISM NOT BEFIT THE PRESENT STUDY?

This chapter earlier summarised three characteristics of positivism: i) hostility to metaphysics; ii) emphasis on prediction over explanation; and iii) empiricist epistemology. One outcome of this view is that it values controlled trials; these emphasise the prediction of change in controlled conditions and thus avoid looking beneath the surface for hidden mechanisms of action or events (Pawson, 2013). What matters in a controlled trial is whether altering one factor is associated with a change in outcome. A controlled trialist might posit a theory as to why the change occurs but this is essentially an instrumental tool, not an account of true but hidden mechanisms. These hidden mechanisms are sometimes referred to as the 'black box' and are of no more than instrumental interest to positivism (Pawson, 2013).

By contrast, this study was concerned with what was going on beneath the surface of doctors' handovers. Conducting research projects focusing on doctors' working practices seems to be uncommon in hospitals in the Czech Republic, as evidenced by a lack of studies on the process of handover communication and the researcher's experiences of data collection. Furthermore, research in patient safety can cover sensitive topics. Finally, doctors are the ones who conduct handovers on a daily basis, and have an in-depth knowledge about the process. Handovers are characterised by huge complexity: what makes handovers go well or badly is likely to be due to a large number of interacting factors. For this reason it is necessary to open the 'black box'. This can be done in a positivist way by conducting multiple controlled trials but the process is laborious and the findings of limited use, applying only to the controlled situation. Realism allows for a

study grounded in the complexity of the social situation rather than abstracted from it - it is a more straightforward way of examining the 'black box'. In addition, if the present study were to adopt the positivist approach, such as a randomised controlled trial, causation would be established at the empirical level and an investigation would be limited to exploring regularities, for example comparing events involving the presence of absence of barriers to effective shift handover communication (Maxwell and Mittapalli, 2010).

Perhaps most importantly in relation to employing positivism in the present study, achieving positivism's 'experimental conditions' and eliminating 'disturbing factors' (Chalmers, 1999) would limit the scope of the present study as distinguishing between 'disturbing factors' and barriers to effective shift handover communication was not possible at the beginning of the study.

All above mentioned factors stress the importance of exploring doctors' perceptions and experiences of barriers to effective shift handover communication, and some of positivism's preferred methods such as a randomised controlled trial would undermine the significance of exploring participants' opinions. To summarise, a positivist inquiry would not be appropriate for the present study as:

- 1) It would not facilitate exploring the so-called 'black box', the underlying structures and processes which may generate ineffective shift handover communication. Studies in the positivist tradition are generally not concerned with underlying mechanisms but only with outcomes. Theories are being used as tools for explaining events but they do not explain deeper structures or the deeper nature of the real world.
- 2) It prioritises 'uncontaminated data' and would therefore undermine exploring doctors' experiences and perceptions. A major difference between critical realism and positivism is that realism does not give epistemic priority to randomised controlled trials; by contrast, these are preferred in positivist

approaches as they offer the prospect of data that are as pure and uncontaminated as possible. Another distinction between critical realism and positivism is that the latter accepts the plausibility of attaining an objective, verifiable knowledge about phenomenon (Schwandt, 2007).

While the above section describes why positivism did not befit the present study, the next section discusses problems with constructivism, which affected the researcher's decision not to adopt it.

2.6.3.2 WHY DID CONSTRUCTIVISM NOT BEFIT THE PRESENT STUDY?

The present study was concerned with exploring both: (a) doctors' perceptions of barriers to conducting effective handover, including what are the underlying factors and mechanisms, which may collectively contribute to ineffective shift handover communication between doctors. Constructivism would be a potentially helpful approach to this concern. However, it would be difficult to find a basis in constructivism to give priority to any particular account, or to combine accounts, in order to say what was really going on during handover (Pawson, 2013). Constructivism, in its purest form, posits that there are as many realities as there are individuals and thus the constructivist inquiry is unlikely to lead to specific conclusions (Lincoln and Guba, 1985).

Furthermore, constructivism is less concerned with the instrumental nature of the world, and would not facilitate exploring patterns and regularities in the underlying factors and mechanisms which collectively contribute to ineffective shift handover communication between doctors. Finally, this study started with a hypothesis (there are certain barriers to effective communication between doctors at shift handover). However, some research methods based on a constructivist epistemology, such as Grounded Theory, are looking for a new abstract, general theory to emerge from the data, and are

not concerned with testing initial hypotheses (Bryant and Charmaz, 2007; Creswell, 2007).

Thus despite the problems with realism outlined in Section 2.5 that led to the rise of positivism and constructivism, realism has attractions in forming the methodology for this study. As well as this, positivism and constructivism have shown themselves to be at least as problematic as realism in the wider philosophy of science. A full account of these problems is unnecessary here but is set out in a wide range of sources (Ladyman, 2002) (Pawson, 2013). Relevant to this thesis, however, are the following:

1) Positivism struggles to give an account of scientific progress, that does not make use of metaphysical concepts, such as genuine cause (rather than coincidental) and invisible forces such as gravity, social stigma and so on (Ladyman, 2002).

2) Constructivism struggles to give a good account of what is going on over and above what individuals think is going on (Ladyman, 2002; Pawson, 2013). Constructivism only seems to be able to provide the multiple accounts but not to adjudicate between them or to draw them together to create a fuller, and truer, account.

Alongside this, realists have developed responses to the problems that led to its decline and the Critical Realism of Bhaskar is an example of this, to which the chapter now turns.

2.7 CRITICAL REALISM

2.7.1 HOW HAS CRITICAL REALISM RESPONDED TO SOME OF THE PROBLEMS RELATED TO THE REJECTION OF NAÏVE/DIRECT AND INDIRECT REALISM?

Realism has recently come back in vogue largely through the work of Roy Bhaskar (Bhaskar, 1975; Bhaskar, 1979; Bhaskar, 1994; Bhaskar, 2008), Ray Pawson (Pawson, 2006; Pawson, 2013) and others. They deal with problems such as The Underdetermination of Theory by Data (UTD) and the Pessimistic Induction (PI) by separating critical realist ontology and epistemology. While this new realism still insists on a separate (what Bhaskar terms) intransitive realm of real objects, it does not insist on an epistemology that guarantees the true knowledge of this realm. Instead, it puts together realist ontology with the constructivist epistemology (Collier and Bhaskar, 1994). The principles of the realist ontology and epistemology are discussed in detail below.

2.7.2 CRITICAL REALIST ONTOLOGY

Critical realism accepts realist ontology, in that it posits the world as existing independently of the human appreciation of it and is ordered in such a way that it can to some degree be known by humans (Collier and Bhaskar, 1994). Therefore, central to 'critical realism' is the notion of the 'epistemic fallacy'; this is the fallacy of equating what we know with what there is. In research it is seen where researchers fail to understand or acknowledge a distinction between the reality and our knowledge about it. Realist ontology contrasts with idealist (constructivists) views, which deny the existence of a non-perceived reality, and positivist views, which deny the possibility of knowledge of a non-perceived reality.

2.7.2.1 NATURAL VERSUS SOCIAL WORLD

According to critical realism the natural and social worlds function differently, however, the two worlds are presented as a layered system of features that have causal inherent powers (Byrne, 2002; Morton, 2008). Critical realism posits that a marked contrast between the social and physical world lies in that societies and social actions, as opposed to the natural world, are determined by human volition (Pawson, 2013): “social activities, unlike natural ones, do not exist independently of the activities they govern” (Collier and Bhaskar, 1994, p. 25). And the natural and social realms are also part of a continuous stratified reality that starts with atoms and develops through objects, to plants, to animals (including humans) (Collier and Bhaskar, 1994). At each new level, phenomena emerge that cannot be reduced to a lower level such that, for example, people's behaviour cannot be explained at the atomic level. Instead, at each level, there is a depth of reality and a depth to the explanation necessary. However, the purpose of scientific inquiry in the natural and social realm is the same, that is, to develop and test fallible theories.

2.7.2.2. A DEPTH TO REALITY

A depth to reality was set up through the transcendental manoeuvre, that will be discussed in details below, and includes three domains of reality: [A] the domain of the real (mechanisms and underlying structures), [B] the domain of the actual (events triggered by mechanisms), and, [C] the domain of the empirical (experiences which we can observe through various senses) (Collier and Bhaskar, 1994). We shall discuss them in turn below.

2.7.2.3. A DEPTH TO REALITY - THE DOMAIN OF THE REAL [A]

In Bhaskar's conception, the empirical can be understood as the endpoint of two further layers or domains of reality; that are presented in a table below.

Table 2.1 The domains of reality

	Domain of real	Domain of actual	Domain of empirical
Mechanisms explanation)	(of v		
Events	v	v	
Experiences	v	v	v

ADOPTED FROM BHASKAR, RTS, (BHASKAR, 2008, P. 13)

The domain of the real is the highest domain of reality. It represents the fundamental level and it comprises all scientific laws (Collier and Bhaskar, 1994). Furthermore, it is 'intransitive', that is, independent of individuals' appreciation and representation, and therefore the attributes of mechanisms and structures comprising it can only be partially comprehended (Collier and Bhaskar, 1994).

Critical realism posits that the domain of the Real consists of non-transitive mechanisms that configure to form events in the Actual (Bhaskar, 1979): "Structures cause powers to be exercised given some input, some 'efficient cause', e.g. the match lights when you strike it. In asking about the structure generating some power of some entity, we are asking about mechanisms generating an event" (Collier and Bhaskar, 1994, p. 43).

2.7.2.4 A DEPTH TO REALITY - THE DOMAIN OF THE ACTUAL [B]

Events in the actual represent the interplay between configurations of causal powers. Depending upon circumstances, events can be either generated or

not (Collier and Bhaskar, 1994). Events are not necessarily perceived or even perceivable. For example, the law of gravity works continuously on objects but only occasionally results in an event, such as an object falling.

In a completely closed system the same patterns will repeat themselves endlessly and therefore it is possible to expect a closed system to give a full account of all the causes and effects within it as you expect those patterns to repeat endlessly. Closed systems are used when we conduct experiments as they allow us to isolate processes and mechanisms which cause an effect from the outcomes of other mechanisms "mechanisms of nature" (Collier and Bhaskar, 1994, p. 32). We attempt to neutralise the effects of those other mechanisms (Collier and Bhaskar, 1994) to be in a position to infer that those other mechanisms are not changing the course of the mechanisms we are investigating. Bhaskar, therefore, defines experiments as "an attempt to trigger or unleash a single mechanism or process in relative isolation, free from the interfering flux of the open world..." (Bhaskar, 1979, p. 35).

Closed systems can be perceived as theoretical devices inside the science (Collier and Bhaskar, 1994). An example of a closed system is an effect of gravity that accelerates objects towards each other. However, there are very few completely closed systems.

Natural systems are never completely closed. An object falling down to the earth is subject to gravity but it is also subject to other forces such as friction. In social systems this is even more the case, not so much because there are many interactive forces but rather because there is one in particular - human volition, that results in actions. The social system is always 'open'. Furthermore, the social world is constantly changing, due to the actions of individuals, who, through changing their perceptions and actions, change the world around them, consciously or not (Shostak, 2002).

The law-like mechanisms of the Real realm never manifest in a pure way in the actual and empirical because they are always working in complex interactions (Tsoukas, 1989), e.g. in a falling object the force of gravity interacts with that of friction. Furthermore, as surrounding circumstances are in flux, the frequency with which non-transitive mechanisms form intransient events varies (Collier and Bhaskar, 1994). Therefore, reality does not constitute law-like, observable regularities and patterns (Collier and Bhaskar, 1994).

Similarly, in the social realm, a tendency can be moderated; neutralised, strengthened or weakened, by other configurations of causal powers (Modell, 2005). For example, hospital policies on shift handover may tend to cause doctors to behave in specific ways. However, this tendency might be countermanded by other causal powers, such as shortage of time making it difficult to comply with policies and regulations. Equally possible, doctors' behaviour (event) may be affected by other intransient properties such as lack of time.

The complex interaction effects of causal powers are magnified in a social setting as this is always an open system (Pawson, 2013). An open system is one in which there is never a pure reproduction of an event. For example, in the closed system of mathematics, 1 plus 1 always equals 2. In the open system of society, there are conflicting additive properties such that we might say both "many hands make light work" and that "too many cooks spoil the broth". Thus, asked whether there is a social rule that the more people are used the better the outcome of a project the answer is always 'it depends'.

Social science in its critical realist form is interested in asking 'it depends on what'? Therefore, it is plausible to describe a tendency for the underlying structures and mechanisms to cause powers to be exercised and generate events; nevertheless, it is not possible to generalise those tendencies and

ascribe them as 'regular' patterns (Tsoukas, 1989). Consequently, events do not simply emerge from 'the all-embracing causal laws' (Modell, 2005), but from the interplay between various configurations of causal powers, that is, intransient tendencies.

Nevertheless, with regard to the natural and social worlds, critical realism posits that objects in the natural world can be explored through experiments, where the researcher isolates certain processes. With regard to experiments per se, the isolation of certain mechanisms from others allow us to understand how they work, and, consequently, conjecture how they would behave in open systems (Collier and Bhaskar, 1994). Furthermore, since mechanisms may 'behave' differently in open and in closed systems, it makes it possible to infer that there are certain aspects of the reality which we cannot perceive and therefore predict which influence the structure of the reality (Collier and Bhaskar, 1994). That is, certain aspects of the reality can be unperceived.

In the natural world experiments are possible as certain defined objects can be controlled by the researcher in experimental conditions (Shostak, 2002). In contrast, exploring the phenomena in the social world is much more complex than in the natural world since the social scientist affects both what is being studied as well as the results of studies (Shostak, 2002). Although the natural world realism is intuitively the most attractive form of realism and if there are any problems with that then there must be even bigger problems in relation to the social world realism.

Such control of experiments in the social world are not plausible for two main reasons, the first reason is that the control of confounding factors is unlikely to be attained; and the second one is that the researcher, with his/her views and perceptions becomes a research instrument and it is likely to not only affect the studied world but also the social world around him/her. It follows

that social researchers have an impact on, that is, change the social reality (Shostak, 2002).

In relation to the present study, social structures present during handover do not exist independently of activities embraced in the handover process. Rather, a mutual relation exists between doctors' perceptions and intentions, and, consequently, their actions, as well as social structures permeating department or hospital. Therefore, doctors' experiences and perceptions of handover and barriers to handover communication are likely to have an impact on its effectiveness.

A summary of the points made above is presented in Table 2.2.

Table 2.2 The natural and social activities, including explanation as to how these relate to the present study.

Proposition	The relevance of the proposition to the present study
<p>"Social structures, unlike natural ones, do not exist independently of the agents' perceptions of what they are doing in their activity" (Collier and Bhaskar, 1994, p. 38).</p>	<p>In relevance to the present study, social structures and their impact on shift handover communication do not exist independently of doctors' perceptions of what they are doing during handover. Therefore, it is important to explore doctors' experiences and perceptions of handover communication.</p>
<p>"Social vs natural realms"</p>	
<p>"Social structures, unlike natural structures, may be only relatively enduring (so that the tendencies they ground may not be universal in the sense of space-time invariant)" (Collier and Bhaskar, 1994, p. 38).</p>	<p>Shift handover communication is a social process and thus it is only relatively enduring. We can discuss the properties of handover communication in some given circumstances. Therefore, it is necessary to evaluate the impact of the context, including social activities, on handover. Furthermore, the findings from the present study are bound to be relevant only to the context in which the study is conducted at a given point in time.</p>
<p>"Social vs natural realms"</p>	

Despite the differences between social and natural realms, both, the social and natural sciences have a common goal of building representations (hypotheses/theories) of the real realms. Those representations (developed hypotheses/theories) represent attempts to posit a REAL mechanism (Bhaskar, 1979), that is, to describe how causal powers (intransient properties = mechanisms and structures) generate events such as components of nature, molecules (in the physic domain); and, societies and events (in the social domain) (Bhaskar, 1979). The enhancement of scientific knowledge in critical realism relates to explaining contingent circumstances

under which intransient properties (causal powers) are triggered and generate events (Modell, 2005).

2.7.2.5 A DEPTH TO REALISM - THE DOMAIN OF THE EMPIRICAL [C]

Events occur in the domain of real and actual, and can occur in the domain of empirical although not always, because not all events are experienced (can be observed/perceived) (Collier and Bhaskar, 1994). Things become 'real' for individuals only when the three domains are 'fused' (Pawson, 2013). As for the domain of empirical, experiences are conceptualised broadly in critical realism and they include the data of our senses, of course, but they also include our understanding of that data. Critical realism is in part a response to the problem positivism has in its insistence on sticking as closely as possible to pure, unadulterated data. The problem is that it is difficult to give a good account of what is meant by pure data. What we perceive is in part what comes through our senses but it is also how we formulate it in theoretical terms. Even the simple observation of a blue sky rests upon numerous ideas and theories we have about, for example, the division of substances in the world into gases and solids, sky and earth; most importantly, our experience of a blue sky will also rest on some understanding of causation, of how it came to be. For example, in aboriginal myth the lightness of the sky is due to servants of the sky putting firewood on a burning egg each day. To some extent, this problem of the lack of pure data is another side of the Underdetermination of Theory by Data thesis: just as it is impossible to give one theory to explain a set of data so it is also impossible to give one description of that data. All our descriptions, just like our theories, depend on auxiliary hypotheses (for example, that I am not currently asleep and dreaming). So for the critical realist, there is never an un-theorised domain of empirical. The domain of empirical is founded on mechanisms that lead to the experience although these mechanisms can be

formulated in many different ways (e.g. creationist myth or Newtonian physics). Nature itself represents a myriad of mechanisms, which work together to establish events (Bhaskar, 1994). Those mechanisms are systematised then into different strata (Bhaskar, 1994).

That is, as mentioned above, the natural and social worlds/realms are real, but our knowledge of them and thus theories we develop are imperfect and fallible; however, those theories are improving over time (Bhaskar, 1979).

2.7.3 EPISTEMOLOGY: THE TRANSCENDENTAL MANOEUVRE

However, the theories humans create about the domain of the real, such as friction and gravity (in the natural domain), and anomie and class conflict (in the social domain) are 'transitive' because they are human artefacts that exist in the domain of the empirical; as such they can be affected and altered by human interventions (Collier and Bhaskar, 1994). That is, reality is intransitive, but our theories of it are transitive and fallible. In the example given above, there is a real intransitive level in which various mechanisms result in the empirical experience of a blue sky. However, our theories about it are transitive, be it myth or science. In other words, the world is as it is, but how we describe and theorise it changes over time and between cultures. This does not mean that we know nothing about the reality, as we shall see when we examine the transcendental argument below, but it does mean that our theories are always fallible, and can be proved false upon the emergence of new evidence and better theories.

The key to the critical realist argument is mentioned above the transcendental manoeuvre taken from the philosophy of Immanuel Kant, amongst others. The transcendental manoeuvre involves asking the question: 'how must the world be in order for it to present as it does to us, as rational animals existing within it?' And the sorts of answers we get are, for

example, that it is a world of cause-and-effect, of regularities, of complexity and so on. These are the fallible theories that we can test, for example, by seeing whether a particular cause and effect is replicated in all situations and, if not, posit why that might be so (Bhaskar, 1979). According to Roy Bhaskar (Bhaskar, 1979) this applies both to the natural realm and the social realm.

The strength of Kant's version of transcendental manoeuvre lies in his proposition that in a sense, we are part of the phenomenon, but also apart from it and therefore we are able to reflect on it. We can say, looking at ourselves as phenomenal beings, experiencing the world in the way we do, how the world must be and how it must be experienced to exist?

If, as critical realism posits, our theories are always transitive and fallible, even though they concern an intransitive reality, how can we ever be said to know anything about this reality? Should we not accept the post-modern or relativist claim that there is no better or worse account of reality, just different ones? Going further, perhaps we should say that it is pointless to speculate about an unknowable, intransitive reality; for human beings, reality is simply what we construct from our fallible position? Critical realism was created in part as a response to this relativist position. It accepts the relativist, constructivist account of knowledge as created, transitive and fallible. However, it rejects that relativist account of ontology that arises from this, that is, that for human beings reality is what we construct, and no construction should be given privilege over another, e.g. the idea that a supernatural account of the world is not inferior to a natural one (Collier and Bhaskar, 1994).

A component of the transcendental manoeuvre is Bhaskar's argument that knowledge can be derived by humans thanks to the characteristics which make us in some sense similar to the material environment, for example, the fact that we have ears and can hear makes us capable of conducting

experiments and thus comprehending knowledge (Collier and Bhaskar, 1994). Indeed, according to Bhaskar experiments are not exclusively limited to thinking, mental activities, but they also embed causal interactions between the researchers and the world they investigate (Collier and Bhaskar, 1994).

As for the transcendental argument, Bhaskar posited that they are characterised by its 'ability' to:

(i) Explain how decisions established by reasoning give a successful account of the likelihood of "the activity that forms a premise" (Collier and Bhaskar, 1994, p. 25).

(ii) Provide arguments for the impossibility of alternative descriptions (in the form of hypotheses and theories) of the reality. Also, those other descriptions of reality can become better than the account of reality (a hypothesis, theory etc.) currently hold (Collier and Bhaskar, 1994).

2.7.3.1 CONSTRUCTING THEORIES ABOUT REALITY

As previously discussed epistemology in critical realism is theory-led. A critical realist investigation, in contrast to those adapting different theoretical positions such as constructivism or positivism, commences with establishing initial hypotheses, which provide a structure for complex mechanisms and underlying structures, and which are then tested throughout the investigation (Pawson, 2013); rather than, like for example a positivist investigation, with a set of observations with a number of questions. That is, for positivism a scientific investigation would begin with an observation of a phenomenon such as sun rising, followed by the development and testing of those theories. For realism the starting point is the ideas we currently have, about the sun and why it rises. There is no pure observation of the sun rising but there is an experience of that phenomenon. The assumptions behind establishing

the starting point is that we are rational beings situated in the world and we have ideas which include answers and questions, and those ideas are our initial hypotheses. That is, critical realist investigations involve causal interactions between researchers and the world (Bhaskar, 1975, p.11). The fact that researchers exist 'knowingly' in the world, allows them to develop transcendental arguments, which illustrate the reality (Bhaskar, 1979, p. 5-6). Developing transcendental arguments involves moving beyond (transcending) the empirical into the reality underlying it (Bhaskar, 1979, p. 5-6). The transcendental manoeuvre allows us to explore the possibility of events to occur. For example, we know that human beings experience the world in certain ways, as colourful, noisy, distressing and so on; the critical realist approach is to ask, not "how do we know anything but rather what must be the case in the realm of real and actual for us to experience the world in the empirical realm in the way we do" (Bhaskar, 1979, p. 5-6). Therefore, theories in critical realism are related to the real in some way and this distinguishes critical realism from positivism and constructivism. For example, there is no point in saying: 'there is a real goal in everything... but we cannot find anything about it...'. That is why positivism maintains this position, which seems to be very reasonable, but realism has difficulty with. Realism, in contrast to positivism, makes claims about whether theories are true or not.

- In the realist account scientific progress involves moving from one scientific position to another. The development of a new theoretical position occurs through processes such as experiment, observation, induction, deduction and abduction.
- Deduction, induction and abduction involve the development of a new knowledge from the basis of the current knowledge.

- Deduction is strictly logical and uses available evidence. That is, information is there waiting to be discovered. An example of deductive reasoning would be: 'Socrates is a man, all men are mortal, and therefore Socrates is mortal'. Nothing new is developed in a deductive process.
- Induction is when researchers draw conclusions on the basis of a repeated observations. An example would be: 'N numbers of swans are white, no black swans are being seen and therefore all swans are white'. Induction is a less sure way than deduction of reasoning, however, it is more adventurous.
- Abduction usually involves forcing a conclusion on a basis of limited evidence. An example of an induction would be: 'all the mushrooms in the bag up to now have been edible. It is safe therefore to eat the remaining mushrooms from the bag.'
- A subgroup of abduction is the Inference to the Best Explanation (Busch, 2009). We know x, y and z. Theory A is the best explanation we have of x, y, and z. Therefore theory A is true. All of those types of reasoning have a place in realism, although realists would prefer to use deduction, that is, the most certain method available.

2.7.3.2 FURTHER ASSUMPTIONS OF CRITICAL REALISM RELATED TO THE SOCIAL WORLD

ANALYSING SOCIAL RELATIONSHIPS - THE TRANSFORMATIONAL MODEL OF SOCIAL ACTIVITY (TMSA)

Critical realism facilitates the exploration of relations between positioned-practices, that is, relations which on the one hand allow individuals to actively participate in social structures, and, on the other hand, those which allow social structures to emerge from/be transformed due to individuals' actions

(the impact of social volition). Relations between positioned-practice are important as they endure through changes in individuals (Collier and Bhaskar, 1994) and therefore they can be explored through a social inquiry. Looking through the lenses of the TMSA, being a doctor in a hospital is constituted *inter alia* by a relation to a hospital director and to other peer doctors (who may accept or reject a doctor from their social-work circle). Certain factors which predispose a doctor's withdrawal from the social-work circle are likely to endure longer than individuals themselves, that is, have stronger impact on social and work practices than individuals' personalities. For example, a doctor with a difficult personality (e.g. a clinical director of a department, who has power to affect things) is likely to not only affect the atmosphere in the department, but s/he may establish practices which may endure after s/he has left the department.

While individual doctors' personalities are likely to play an important role in handover effectiveness, the present study also took into consideration relations between positioned-practice (in the case of the present study handovers involving junior and senior doctors). Investigating those relations was used to explore barriers arising from relations within the hierarchy. For example, junior doctors may not be 'allowed' to challenge decisions made by their senior colleagues. The plausible consequence of not being allowed to express their opinions might be that once junior doctors are promoted to senior positions, they may treat their subordinates in the same way they were treated. Understanding these relations requires exploring reasons for human action.

Below we discuss a realist account of a social action, one in which reasons for action can persist and exist above and above beyond specific individuals' reasons for behaving in certain ways.

Reasons for action: "Now the autonomy of the social and psychological is at one with our institutions. Thus we do suppose that the reason why the rubbish is collected is not necessarily the rubbish collector's reason for collecting it (through it depends on the latter)" (Bhaskar, 1979, p.35-36; cited in Collier and Bhaskar, 1994, p.147).

Reasons for action are an example of something that is real in a social realm and it is more than a reason for an action given by an individual who acts. A constructivist account of a social reality would be about different realities, different truths e.g. reasons for collecting rubbish. We could ask a question: 'Why is rubbish collected?' and plausible answers would be: to earn money, clean streets, protect the environment etc. but a realist account makes it possible to distinguish different types of reasons, that is, essentially the reasons why rubbish is collected can be considered according to mechanisms, structures etc. needed for an action to take place.

That is, critical realism posits that differences between the conditions of an action (such as the various mechanisms and events that make the collection of the rubbish at my house on Monday morning occur) may result in differences in outcomes (Collier and Bhaskar, 1994); these differences cause unseen interplay which may result in conflict in the domain of the empirical. In the example, the rubbish collector's reason for collecting it (to be paid) may conflict with the reason for it being collected (for the environment) for example, in the event of a strike. In respect to the present study, the condition for the action of handover, is not necessarily doctors' reason for conducting it. Exploring doctors' reasons for action (their beliefs about the role(s) and importance of shift handover communication) may provide insights into barriers, such as, any differences between feasible actions and those dictated by the regulations. The present study, therefore, evaluated doctors' experiences and perceptions of barriers to effective shift handover communication and explored their ideas about the importance of handover

and their reasons for engaging in it (during Theory-testing Phase III). It found, for example, that doctors had different ideas of the importance of handover.

***2.7.3.3 THE ASSUMPTIONS OF CRITICAL REALISM RELATED TO THE SOCIAL WORLD
WHICH FACILITATE INVESTIGATING A SOCIAL PROCESS - SHIFT HANDOVERS
COMMUNICATION BETWEEN DOCTORS***

Handover is a social process and social interactions during handover represent inherent constituents of working in hospitals (Vosk and Milofsky, 1999). Social relationships both are affected by working practices and create them (Vosk and Milofsky, 1999). Social relationships may have tangible and intangible impacts on handover. For example, ways in which doctors experience and perceive interactions with their handover counterparts have a bearing on how they communicate during shift handover.

Critical realism allows us to investigate the effects of social relationships on events and process (Collier and Bhaskar, 1994), and vice versa. It posits that the power of society (e.g. a hospital society) is greater than powers, which individual doctors could produce on their own. The fact that 'powers' produced by a group of doctors are greater than 'powers' produced by individual doctors stresses the importance of exploring the impact of social relationships on handover and critical realism facilitates this process. Investigating the social context is important as this is the society, which determines which actions are possible and what their outcomes might be.

In respect to the present study, the researcher inquired into what must be the case in the domain of the real and actual for doctors to experience shift handover communication and barriers to shift handover communication in the way they do. Furthermore, the researcher verified the properties of shift handover communication, which made it a possible object of knowledge. This was done during the initial familiarisation stage that comprised

observations of the process of shift handover communication between the Czech Republic doctors, and informal discussions with doctors and hospital managers. The familiarisation stage established that handover is a possible object of knowledge, and that the Czech Republic doctors may encounter obstacles to effective communication during the process. This preliminary insight into shift handover guided the formulation of research questions and hypotheses, regarding possible barriers to handover, which were then tested during the study. Critical realism accepts that scientists do not have an immediate access to the unbiased reality, but that these can be conceptualised based on a combination of empirical observations and abstract conceptualization.

A critical realist inquiry focuses on: (a) assessing the capacity of various theories to explain phenomena, and, (b) suggesting ideas regarding how intransient mechanisms generate events (Bhaskar, 2011). As a result, the outcomes of a critical realist inquiry are hypotheses and theories about regularities and tendencies which are the probable representations of causal powers which generate events (Modell, 2005).

If available theories do not adequately explain empirical evidence, a search for alternative theories continues (Modell, 2005). In contrast to an inquiry for example in a positivist tradition, where one theory is tested, a critical realist inquiry often involves testing of multiple theories.

Furthermore, an inquiry focuses on the underlying mechanisms and structures which cause causal powers to emerge and generate events (Tsoukas, 1989), e.g. in the case of the present study, barriers to effective shift handover communication. An inquiry is usually complemented by “abstract conceptualization with reference to intransient mechanisms, as well as empirical probing into the contingent circumstances of concrete events. Such empirical probing is necessary to arrive at some inter-subjective

understanding of the causal powers humans ascribe to various mechanisms" (Modell, 2005, p.28).

In accordance with the principles of critical realism, the present study commenced with the establishment of multiple theories to be tested against the empirical data. These theories were elicited from previous studies on handover. That is, the study explored the capacity of the available evidence to explain which factors impede the Czech Republic doctors' capacity to communicate effectively during shift handover. The researcher tested different theories about how contexts, factors, underlying mechanisms and structures, related to individuals' performance, environment, organisation and system, generate an ineffective handover. For example, the researcher would test the following hypothesis, "If there is noisy background, then shift handover communication is challenging; that is, noisy background is a barrier to conducting shift handover effectively". Of importance, previous studies on handover were used as the first source of data to test the hypotheses established at the outset of the present study.

To summarise, the present study focused on exploring the capacity of current evidence for explaining factors which impede the Czech Republic doctors' capacity to conduct handover effectively. In accordance with the critical realist's principles the present inquiry started with establishing multiple theories regarding the nature of barriers to conducting handover between. Afterwards, the researcher tested different theories about barriers to conducting handover, related to individual performance, environmental and organisational/system barriers. Emerging theories informed the establishment of a new theoretical position regarding how underlying mechanisms and structures cause powers to emerge (intransient properties), and, generate an ineffective handover (event).

2.7.3.4 CHARACTERISTICS OF CRITICAL REALIST THEORIES

In realism, science is a process where theories emerge from other theories. Theories in a critical realist tradition are characterised by four features. First, they are objective and may describe things which do not appear; that is, what is known would be true despite whether or not it was known" (Bhaskar, 1979). Secondly, they are fallible, that is, can be proven false upon the emergence of new knowledge (Bhaskar, 1979). They are fallible because whilst they are often 'about' intransitive objects in the domain of the real they are themselves transitive objects in the domain of the empirical. Thirdly, they are trans-phenomenal as they generate knowledge of underlying structures (beyond what appears). Fourthly, they are counter-phenomenal, as a new knowledge of underlying structures may contradict what appears to be (Bhaskar, 1979).

2.7.3.5 WHAT IS THE ROLE OF REALIST PHILOSOPHY IN RELATION TO PRACTICE? HOW DOES CRITICAL REALISM ENHANCE EXPLORING HANDOVER PRACTICES? HOW CAN HANDOVER PRACTICES BENEFIT FROM A CRITICAL REALIST'S INQUIRY?

The overall approach to evaluating practices in the critical realist tradition

The aim of investigations within the tradition of critical realism is to transform practices (Collier, 1994); through the following:

- 1) Acknowledging that knowledge can be counter phenomenal; it 'makes a place for our liberation from enslaving appearances' (Collier and Bhaskar, 1994);
- 2) Eliciting theories which can facilitate the evaluation of practices against objective criteria;
- 3) Recognising that inner structures either determine or codetermine outcomes and through promoting transformation of existing structures.

That is, a critical realist's enquiry is likely to (a) criticise the practice, e.g. through revealing inconsistencies inherent in the practice; (b) defend the practice against criticism, e.g. by proving that things considered to be impossible, can be done in practice (Bhaskar, 2008, p. 24). That is, investigations guided by the critical realist tradition are concerned with exploring what kind of things can and cannot be done to improve outcomes given existing structures. Also, how inner structures need to be transformed to produce different/better than current outcomes (Bhaskar, 1994). It accepts that some outcomes cannot be changed unless new structures and/or systems have been implemented (Bhaskar, 1994).

The present study was not concerned with transforming handover practices per se, but with developing hypotheses that could inform either changes in practices or a development of a new code of practice. In detail, the present study aimed to develop hypotheses illustrating how underlying structures and mechanisms generate an effective/ineffective shift handover communication between doctors and how those structures could be transformed into new ones which produce better 'outcomes', efficient handover practices.

The assumptions of critical realist epistemology are:

- 1) Mechanisms and structures exist independently of whether or not they are triggered and generate events; namely, they may lie dormant and remain that way.
- 2) Explanations developed through critical realism are relevant to specific circumstances, which, for the most part, are unlikely to be stable across time and space.
- 3) We develop fallible theories which, however, improve over time.
- 4) Critical realist investigations focus on exploring how underlying mechanisms and structures may generate events.

- 5) Critical realist investigations commence with the establishment of a theory or theories which are then tested throughout the study.
- 6) The outcome(s) of critical realist investigations is a new theoretical position, from which new studies shall begin.

2.7.3.6 CRITICAL REALISM: RESEARCH METHODS

Critical realism is compatible with qualitative and quantitative methodology and posits that qualitative and quantitative approaches are complementary (Maxwell and Mittapalli, 2010). A mixed-methods approach comprises qualitative and quantitative methods within a single study (Tashakkori and Teddlie, 2010) and is going to be discussed in more detail in Chapter 3 of this thesis. Many scientists have rejected the use of mixed methods claiming that the logic underlying qualitative and quantitative research methods essentially differs and therefore treating qualitative and quantitative research methods as complementary cannot be justified (Smith, 1983; Smith, 1984; Smith, 1989). However, mixed methods research based in realist tradition has focused on addressing the shortcomings of positivisms and constructivism and on how these limitations could be limited. Realists argue that the choice of research methods should be based upon pragmatic considerations, the foundation of the aims and conditions of research (Reichardt and Cook, 1979; Bryman, 1988; Bryman, 1992; Hammersley, 1992a; Hammersley, 1992b; Bryman, Becker and Sempik, 2008). This position further advocates the merits of seeing qualitative and quantitative approaches as representing diverse perspectives (Atkinson, 2001).

Quantitative research methods such as quantitative analyses (statistical tests) can be exploited to: (a) identify the most frequently occurring events (e.g. which factors most frequently contribute to ineffective shift handover communication between doctors); (b) indicate the probability with which some

correlations reflect the real, 'non-random' tendencies or patterns; that is what might be the underlying mechanisms and structures which generate ineffective shift handover communication between doctors.

However, knowledge of the most frequently occurring obstacles and correlations between them is insufficient to explain 'contingent conditions' under which structures and mechanisms may generate events (Tsoukas, 1989). Qualitative methods can be used to enhance the results of quantitative methods. When applying the principles of critical realism, qualitative methods usually follow the quantitative ones (Tsoukas, 1989). Hence, mixed methods approaches are particularly suitable to critical realism and to the identification of causal pathways leading to events.

The qualitative followed by quantitative methods is suited when (a) a phenomenon is little understood and has little theory around it, and, (b) where a study involves the design and testing of a new intervention or instrument. In the present study the phenomenon was well known; doctors' handover was employed in some form across the world. There was also a lot of relevant theory; problems with communication during handover had been noted and investigation into these had taken place. However, little or none was from the Czech Republic. Therefore it made sense to utilise critical realism, which allows testing of established theories against new empirical data. It also allows exploring, both, patterns and tendencies (which can be examined via quantitative research methods, such as a questionnaire survey). In addition, critical realism facilitates the exploration of processes and structures beneath what appears to be, beneath patterns and tendencies. The structures and mechanisms, which may trigger a specific process (in the case of the present study, ineffective shift handover communication between doctors) can be examined via qualitative methods.

2.7.4 CRITICAL REALISM IN THE PRESENT STUDY

As a theoretical framework, critical realism was a suitable theoretical tradition to guide a descriptive and an exploratory study on barriers to conducting effective handover between doctors in hospitals in the Czech Republic. Critical realism guided all stages of the process: the conceptualisation of research questions, the choice of a study design and research methods, drawing hypotheses upon the completion of a critical review of literature, data collection and analysis, as well as the development of new hypotheses explaining how various factors and mechanisms may collectively contribute to ineffective shift handover communication between doctors. As it was previously discussed (Section 2.7.2), critical realism is a theory-led approach. Because of its epistemological position critical realism sees the start of enquiry as one set of theoretical positions to be tested and the end of enquiry as a new, better theoretical position. The design of this study, therefore, took the form of three phases of theory testing. The first theory-teasing phase was led by initial hypotheses about barriers to effective shift handover communication between doctors with which the study began and consisted of testing those ideas and developing new ones through a critical review of the existing literature.

The results of the literature review gave a new set of theory which led the second, quantitative research phase, that is, the hypotheses which emerged from the literature review, were used to design a questionnaire survey. The results of the questionnaire survey established a new theoretical position which led the third, qualitative phase - semi-structured interviews with doctors. The results of the three phases of theory testing were then discussed in the light of empirical evidence and informed the final theoretical position for this study when the researcher was making the inference from the entire study.

2.7.4.1 CRITICAL REALISM AND PRESENT STUDY - SECTION SUMMARY

Overall, using a critical realist approach facilitated the identification and exploration of the underlying structures and mechanisms, which generate effective/ineffective practices and processes (Collier and Bhaskar, 1994). Bhaskar cites Kant approvingly to the effect that it is 'the function of philosophy to analyse concepts which are 'already given' but 'confused' (Bhaskar, 2008, p. 24). The purpose of the present study was to examine emerging properties, namely, which factors and mechanism lead to ineffective shift handover communication between doctors, and to develop hypotheses regarding how underlying factors and mechanisms may collectively contribute to ineffective handover communication.

The investigation comprised exploring doctors' experiences and perceptions to reveal barriers to effective communication at shift handover; and it utilised quantitative and qualitative research methods. Qualitative research methods facilitate the exploration of underlying mechanisms and structures, which generate an effective/ineffective handover communication. Hypotheses developed from the results of the present study provided the ground for future work on handover communication.

Before moving to the full account of the research, it is worth considering the impact of the realist approach by comparing it with two major alternative approaches, positivism and constructivism. Table 2.3 presents a comparison between the four research paradigms: naïve realism, positivism, critical realism and constructivism, and Table 2.4 illustrates how the how the present study would have looked if it would be guided by different research traditions.

Table 2.3. A comparison between the four research paradigms: naïve realism, positivism, critical realism and constructivism.

	Indirect Realism	Positivism	Critical Realism	Constructivism
Ontology	Realist	Neutral or none	Realist	Idealist Constructivist Non-realist
Epistemology	Realist	Empiricist plus instrumentalist	Constructivist/Relativist	Constructivist
Methodology	Inductivism, that is, non-deductive reasoning. In a nutshell – a generalisation made from a set of data (gathered via observations) e.g. enumerative induction (Ladyman, 2002) eliciting common traits from a number of observed instances.	Deductive (e.g. hypothetico-deductive, H-D)	Deductive Inference to the Best Explanation	Phenomenology Grounded theory Ethnography
Methods	Observations (with no preconceptions).	Mixed Methods, Quantitative methods, experimental methods, clinical trials, observational studies.	Mixed Methods.	Qualitative methods, in depth interviews, observations, focus groups.
Philosophical forebears	Aristotle, Galileo	British Empiricists: David Hume, George Berkeley, John Locke.	Popper, Roy Bhaskar, Leibniz, Descartes.	Plato, Immanuel Kant, Schopenhauer, Glaser, Dewey, Strauss, Piaget, Vygotsky.

2.8 HOW THIS RESEARCH WOULD HAVE LOOKED IF GUIDED BY DIFFERENT RESEARCH TRADITIONS SUCH AS POSITIVISM OR CONSTRUCTIVISM?

Table 2.4 illustrates how the present study would have looked if it would be guided by different research traditions (constructivism and positivism).

Table 2.4 How the current study would have been if it would be guided by different research traditions [Critical Realism, Positivism and Constructivism].

Methodology	Critical Realism	Positivism	Constructivism
<p>The overall objective of the present study:</p> <p>This study is concerned with examining how underlying mechanisms and structures related to individual performance, environment, and organisation generate an effective/ineffective shift handover communication.</p> <p>Furthermore, the study is concerned with exploring what is happening in a 'black box', that is, beyond what appear to be, or, what doctors believe is happening [it is easy to overlook issues when we are engrossed in activities].</p>	<p>Critical realism facilitates exploring underlying mechanisms and structures, which generate events, and it allows to get beneath what appears to be.</p> <p>[Although the present study is concerned with exploring factors, underlying structures and mechanisms which generate an ineffective shift handover communication between doctors, once barriers to handover have been specified, it will be plausible to specify the features of an effective shift handover communication.</p> <p>To develop a detailed account of a phenomenon (barriers to shift handover communication between doctors in hospitals in the Czech Republic).</p>	<p>Investigations in a positivist tradition are limited to exploring the empirical domain and do not dig deeper to underlying causes and mechanisms which generate events. The positivist approach does not facilitate the exploration of events, which may not be experienced, about the underlying structures and mechanisms, which generate ineffective shift handover communication between doctors.</p> <p>Also, the researcher would not be able to use intuition to draw inferences about the collected data (information about the underlying structures and mechanisms which generate an ineffective shift handover communication).</p> <p>Positivism is concerned with inductive reasoning, and therefore it does not allow to derive knowledge of the unobservable (Chalmers, 1999).</p>	<p>Individuals' meanings of the events represent everything there is (Creswell, 2007).</p> <p>The constructivist approach is often used "when the researcher does not know the important variables to examine" (Creswell, 2007).</p> <p>Constructivism is less concerned with the instrumental nature of the world, and would not facilitate exploring patterns and regularities in the underlying structures and mechanisms which generate events, in the case of the present study, event equal barrier to effective shift handover communication between doctors.</p>
<p>Uncovering the truth:</p> <p>This study is concerned with exploring</p>	<p>Critical realism makes attempts to discover the reality. Also, it is interested in exploring: (a) what is 'hidden' in the 'black</p>	<p>Positivism is concerned with usefulness of theories, rather than</p>	<p>According to constructivism, explanations are theoretical constructions, which are neither true</p>

what is really happening during the process of handover; that is, with what are the real barriers to effective shift handover communication between doctors; barriers which may stem, for example from the individual performance, environment and the system (the context in which doctors conduct shift handover).	box'; how various factors (of which doctors may or may not be aware of) negatively affect shift handover communication between doctors. That is, critical realism goes beyond appearance, beyond what appears to be (for example, beyond what doctors' beliefs about events taking place during shift handover communication).	with how true they are. Only empirical experiences (the researcher's and doctors') are real. The investigation in the positivist tradition would be concerned with building a model or theory of how handover communication between doctors works. This positivist model would be evaluated in terms of its usefulness, rather than in terms of how accurate it is. Investigations in the positivist tradition prioritise 'uncontaminated data' and would therefore undermine exploring doctors' experiences and perceptions.	nor false. There is no reason to prefer, for example, a scientific over, let's say, a magic-based account. Consequently, the meaning of social phenomena arises from the meaning of the worlds as created by individuals. There may be as many realities (true account of events) as there are individuals.
Social science	Social science uses the same essential approach as natural science. However, it is not reducible to it. Because phenomena are emergent, each science cannot be reduced to another. The researcher needs to produce the condition of closure so that the real and actual domain can be combined (Tsoukas, 1989).	The emergence of knowledge lacks clear links with ontological premises regarding what the world must be like if our knowledge of it is possible (Bhaskar, 1979). Positivism further lacks links with the sociological procedures that govern social relationships within which we ascertain we determine the adequacy of scientific claims (Bhaskar, 1979).	Some constructivists draw a sharp distinction between social and natural science, viewing the methods related to positivism as suitable for the latter but other, typically qualitative methods, as suitable for the latter. Other constructivists deny the special role of natural science in investigating the natural world.
Causality	Dwells on establishing interplay between different factors (underlying mechanisms and structures), which generate events.	Causality relates to random relations of regularities and patterns of events and it dwells on correlations. That is,	The meaning of social phenomenon emerges from the meaning of the worlds as experienced by

	<p>"Similarities between the units of analysis are explained by the generative mechanisms and the similar type of contingencies within which the operation of different generative mechanisms or to the dissimilar contingencies within which the operation of a similar set of mechanisms has taken place."</p> <p>Causality lies in the underlying structures and mechanisms, which generate events. Causality is NOT concerned with establish causation by describing processes or systems which are linked with random probability (Tsoukas, 1989), but it is concerned with ascribing a particular quality of tendencies, causal powers (of the underlying mechanisms and events) to events/objects. The ascription of causal mechanisms, structures (powers) involves determining specific ways in which they act under given circumstances. Therefore, critical realism explanations are context-specific: "Whether a particular power is exercised, and whether it manifests itself in the actual and/or empirical domain depends on the ambient contingent conditions." (Tsoukas, 1989, p.553). "This is why we create take care to create (or not to create) appropriate conditions for the activation (or nonactivation) of a causal power, and thus for the occurrence (or avoidance) of a certain set of desirable results." (Tsoukas, 1989, p. 553).</p> <p>Causal laws can be identified when they are independent of the events they</p>	<p>studies in the positivist domain attempt to establish causation by describing processes or systems which are linked with possibility of something happening or being true (Tsoukas, 1989).</p> <p>Causality is established at the level of empirical experience and this would not allow to adequately answers research questions addressed in the present study.</p> <p>The present study is concerned with exploring the 'reality', not only with things which can be observed in a closed system, but with things which cannot be observed and/or quantified.</p>	<p>individuals. Causality is constructed from a series of representations of reality.</p>
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	generate (Tsoukas, 1989). We can conceptualise the causal capabilities of underlying mechanisms and structures to generate events (Tsoukas, 1989). Furthermore, it produces knowledge of the ways in which causal powers and tendencies are generated into events/patterns of events (Tsoukas, 1989).		
Generality	Generality is assigned to the working of causal tendencies (powers) (Tsoukas, 1989). Causal powers and tendencies work in their 'usual' ways even if they are not realised (are not turned into events). Causal powers (tendencies) may be not realised as they depend upon particular circumstances and because various causal powers, tendencies may mitigate their 'powers' and lead to no events (Tsoukas, 1989).	Generality is ascribed to patterns and recurrent regularities.	Generality isn't plausible as there are as many realities as there are individuals.
Explanatory versus predictive	In social science it is impossible to produce the conditions of a closed system; therefore, studies are explanatory as social science shall be predictive.	If a statistical significance has been shown, the results can be generalised to a wider population. Predicting future events and behaviours is either implied or accomplished in positivist inquiries.	Predicting future events is not an objective of investigations in constructivist tradition.
A pragmatic consideration of the present study: an evaluation of shift handover	Realism is transformative as it allows to evaluate practice against objective criteria.	Evaluations in the positivist tradition are helpful in testing theories about	The evaluation of practices would be limited to evaluating doctors'

practices (communication between doctors).	Practices are evaluated in order to identify which things can and which cannot be changed within existing structures. Critical realist evaluations allow therefore the researcher to estimate the extent to which the current structures and systems need to be changed to results in practice improvements. Critical realist evaluations are also concerned with which and what kind of structures needs to be transformed to result in required change in practices.	practices. Those evaluations would involve generalisations of findings. Any inferences would be drawn from what can be observed.	experiences and perceptions. The inquiry would not get beneath what appears to be.
Methods	Mixed methods including, for example, observations, interviews, and surveys.	Experiments (RCT), surveys, cross-sectional studies, longitudinal studies employing survey.	In-depth interviews focus groups. Interviews with open-ended questions so that participants can share their worldviews with the researcher.
A plausible research question	What are barriers to effective shift handover communication between doctors, in hospitals in the Czech Republic?	How often are doctors interrupted during handover? How do interruptions affect the handover process between doctors? How are different barriers to effective shift handover (x, y and z) correlated to the effectiveness of communication between doctors?	What are doctors' perceptions and experiences of barriers to effective shift handover communication?

CHAPTER 3 STUDY DESIGN: AN OVERVIEW

3.1 INTRODUCTION

As discussed in Chapter 2, the application of the principles of critical realism to investigating handover practices offers a useful approach to addressing the gaps in knowledge as they relate to practice in the Czech Republic.

The overall aim of this chapter is to present the design and methods used to conduct the present study. In detail, the chapter provides the rationale behind employing a mixed-methods approach and delineates the characteristics and application of a sequential mixed design in the present study.

3.2 STUDY DESIGN

Despite the complexity of shift handover between doctors, to date, there has been no published evaluation of handover practices in the Czech Republic, nor has there been a study investigating how the underlying structures and mechanisms related to individual performance, environment and system generate ineffective shift handover communication between doctors. In order to address these gaps, a mixed-methods sequential explanatory study was designed and undertaken to provide a comprehensive insight into factors, context, mechanisms, structures and processes which generate ineffective shift handover communication between doctors.

3.2.1 MIXED-METHODS DESIGN

A mixed-methods approach comprises qualitative and quantitative methods within a single study (Rossman and Wilson, 1985b; Bryman, 2006;

Tashakkori, 2010). No single definition of mixed methods approach exists or is dominant in use (Caracelli and Greene 1997). "Arguably the single most important impediment to an organic view of mixed methods research is to simplify it as mixes of "qualitative" and "quantitative" elements" (Tashakkori and Teddlie 2003, p.731). That is, a mixed-methods approach comprises qualitative and quantitative methods within a single study (Tashakkori, 2010), and, of particular relevance to the present study, a mixed methods approach allows the researcher to examine the qualitative and quantitative dimensions of a phenomenon (Moran-Ellis et al., 2006). For example, questionnaire surveys may identify what is important to individuals (Tashakkori and Teddlie 2003) while in-depth understanding of these items may elicit why those things are important to them. In more general terms, in social science, qualitative research is used to gain knowledge about human beings and their experiences. Quantitative research, on the other hand, can be used, for example, to explore whether features of experiences are shared in different contexts, or, to identify behaviour patterns.

Furthermore, a mixed-methods approach makes it possible to:

- (1) Enhance the breadth and depth of understanding of a research problem through, for example, using qualitative data to complement the quantitative ones (Maxwell and Mittapalli, 2010); and,
- (2) Use the results of one method (a questionnaire survey) to inform the design and conduct of the other method (semi-structured interviews) (Greene, Caracelli and Graham, 1989).

3.2.2 A SEQUENTIAL MIXED DESIGN

Various typologies of a mixed-methods design exist (Tashakkori, 2010). A sequential mixed design fitted the purpose of the present study. The design comprises two phases, typically, a quantitative phase, followed by a

qualitative one (Cresswell, 2003). The main feature of this design is that quantitative data elicited in the first empirical phase delineate a phenomenon under investigation, but not more "than surface structures generated by the causal powers at work in a particular social setting" (Modell, 2005, p.11). In addition, when employing a sequential mixed design the quantitative data collected in the first empirical phase are used to develop data collection tools used in the second, qualitative phase of the study (Creswell, 2003; Tashakkori, 2010). Qualitative data (Phase II) enhance and expand the quantitative finding, generating in-depth insights of the research problem (Tashakkori and Teddli, 1998; Cresswell, 2003). Sometimes, a qualitative followed by the quantitative method is suitable, typically when i) a phenomenon is little understood and has little theory around it, and, ii) when the study goal is to design and testing of a new intervention or instrument. However, in the present study, the phenomenon, barriers to effective shift handover communication between doctors, was well-known in some form across the world, and there was a lot of relevant theory.

However, there was little or no evidence from the Czech Republic. It made sense therefore to start the inquiry with quantitative surveys to see the extent to which the patterns abroad were matched with the Czech Republic (identify the key barriers to shift handover communication), and afterwards, to employ qualitative interviews to examine the particulars (causes of the key barriers). The knowledge base for barriers to conducting shift handover made possible a quantitative-qualitative sequence of data collection. However, if there had not been much of a knowledge base, the present study would utilise a qualitative - quantitative sequence of data collection.

In addition, the results of previous research on shift handovers between doctors, conducted outside of the Czech Republic, provided a strong knowledge base that was utilised in the present study to develop a data collection tool used in Phase II. In detail, quantitative methods were used to:

(i) elicit doctors' experiences and perceptions of whether they encounter barriers to effective shift handover communication identified in hospitals around the world and their perceptions of the key barriers to effective shift handover communication between doctors; (ii) identify types of factors contributing or leading to ineffective handover communication between doctors (barriers); and, (iii) correlations between them (patterns and tendencies). Exploring the causal mechanisms required a qualitative approach. In other words, the study sought to ask why certain factors were associated with poor handover, not simply to show that they were.

METHODOLOGICAL ISSUES

A number of methodological issues need to be taken into account when employing a mixed-methods sequential explanatory design:

- When to integrate qualitative and quantitative approaches (A)
- Whether and which methods, qualitative or quantitative, should be prioritised (B)
- An order in which qualitative and quantitative methods are employed (C)

(A) Integrating quantitative and qualitative methods – the new empirical data

One of the main challenge in conducting a mixed methods study is related to 'the timing' (Song, Sandelowski and Happ, 2010, p.731) and 'priming effects' (Vitale, Armenakis and Feild, 2008) of diverse methods of data collection. Timing and priming concern whether data collection and analysis methods are carried out consecutively or simultaneously (Song, Sandelowski and Happ, 2010, p.731).

According to Riggin (1997) the choice of a model of method and data integration in mixed methods studies should reflect aims and objectives of the study. The initial focus of the study was to identify whether barriers to handover found in hospital settings around the world were encountered by doctors working in hospitals in the Czech Republic. Consequently, the study focused on exploring the causes of barriers to effective shift handover communication. Deploying a mixed methods approach, each method informed the development of a next one, several iterations took place extending the scope of the model of causation (underlying structures and mechanisms that lead to poor handover). Methods were merged in various ways, some of them were conducted at the same time, whereas others took place one after the other.

In the present study, the qualitative and quantitative methods were integrated at three stages. The first integration took place at the study conceptualisation stage, that is, the research questions related to: (i) quantitative data - whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic, and, what are the main perceived barriers to effective shift handover communication, including apparent barriers based on correlations (plausible interplays between barriers which may lead to ineffective handovers), and, (ii) qualitative data - how various factors, mechanisms and structures generate ineffective shift handover communication (causation). The second integration occurred when a subset of the key, statistically significant, barriers to handover identified in Phase II, were selected for further exploration in Phase III, using a qualitative approach (semi-structured interviews). The final integration took place in the discussion chapter, where the findings from qualitative and quantitative methods were brought together to generate explanatory hypotheses of how various contexts, factors, mechanisms and

structures may generate ineffective shift handover communication between doctors.

(B) Prioritising research methods exploited in the study

Priority is assigned according to research questions addressed in the study. In the present study, the two methods were given equal weight, as both equally contributed towards answering research questions; this included providing a set of relevant data which informed the development of theories/hypotheses on how various factors and mechanisms may collectively contribute to ineffective communication at shift handover. That is, together with the findings from previous studies (that is, the results of a critical review of literature conducted in Phase I), the results of the two empirical Phases (II and III) informed the development of hypotheses illustrating how various factors and mechanisms may collectively contribute to ineffective communication at shift handover between doctors.

(C) A sequence in which quantitative and qualitative methods (empirical phases) are employed and the methods used during each phase

EMPIRICAL PHASE II - a questionnaire survey to investigate whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic and to explore the key barriers to effective communication at shift handover between doctors in hospitals in the Czech Republic as identified by those doctors.

EMPIRICAL PHASE III – semi-structured interviews with doctors to explore the causes of the key barriers to effective shift handover communication.

To reiterate, in accordance with the critical realist principles, this present study commenced with the establishment of multiple theories to be tested against the empirical data. These initial theories were elicited from previous

studies on handover, including the researcher's work and familiarization with handover practices in the Czech Republic hospitals. That is, the study explored the capacity of available evidence to explain which factors impede The Czech Republic doctors' capacity to communicate effectively at handover. In total, the current study included three theory-testing phases [two of which (II & III) were new empirical phases of the present study].

3.3 STUDY SETTING

The study participants were recruited from inpatient units in two medium-sized hospitals (Site 1 and Site 2) in the Czech Republic. Site 1 is a public hospital with approximately 500 beds; Site 2 is a university hospital with 750 beds. Site 1 comprises 19 specialised departments, including, among others, medicine, surgery, gynaecology and intensive care unit. In 2011 there were approximately 16,250 patients admitted to the hospital. Site 2 comprises 22 specialised departments, including medicine, surgery, neurosurgery and ear, nose and throat (ENT); in 2012, there were approximately 23,000 patients admitted to the hospital. The two Sites have been accredited by Joint Commission International (JCI) and are representative of public hospitals in the Czech Republic.

3.4 ETHICS

Ethical approval for the research was granted from the Sheffield Hallam University Research Ethics Committee and Research Governance permission was granted by the Research and Development Departments at the two Czech Republic hospitals.

The researcher adhered to the following principles throughout the research process:

DATA PROTECTION: Although patients were not directly involved in the present study, sensitive data could have been collected. All data, therefore, were anonymised and kept securely in a locked cabinet at Sheffield Hallam University. Only the researcher and academic supervisors had access to the data.

WRITTEN CONSENT: All participants were required to provide informed consent. Consent to participate was given in two ways. In Phase I the return of the questionnaire was taken to imply consent. In Phase II each informant was required to give informed consent prior to taking part in an interview.

The participants received no inducement to participate in the study.

The three theory-testing phases (Phase I: A Critical Review of Literature, Phase II: A Questionnaire Survey, Phase III: Interviews) were preceded by a familiarisation phase (0).

3.5 PHASE 0

3.5.1 FAMILIARISATION PHASE – THE INITIAL IMMERSION IN THE FIELDWORK

The empirical section of the present study began with a familiarisation phase; its purpose was five-fold:

- (a) To explore whether barriers to effective shift handover communication between doctors identified in hospitals around the world (in previous studies) were relevant to the Czech Republic context;
- (b) To discuss the research problem, shift handover, with doctors and hospital managers, that is, to identify whether researching shift handover between doctors was a research priority;

- (c) To verify research questions and to generate initial hypotheses regarding barriers to effective shift handover communication between doctors;
- (d) To gain an overview of the study setting; and,
- (e) To evaluate the feasibility of conducting fieldwork: distributing a questionnaire survey and conducting semi-structured interviews.

The familiarisation phase included the following components: (i) Brief observations of shift handover sessions, 6 at each site, and, (ii) Informal chats with doctors (N = 5) and hospital managers (N = 3).

Observations facilitate capturing a research problem in its own terms (Guba and Lincoln, 1981), and therefore they allowed the researcher to explore what was happening during handover. In terms of methods used, observations differ depending on: the researcher's engagement in a study setting (Gold, 1985); whether or not an observation protocol is used (structured or unstructured observations); and, whether observations are conducted openly or secretly (overt or covert observations). In the present study, the researcher engaged in non-participant, semi-structured observations (Emerson, 1981 in Murphy et al., 1998). Observations were conducted to get the outsider's view, as objective as possible, of what was going on beyond the obvious, beyond what appeared to be, or, beyond what the researcher could learn from doctors' records of their experiences and perceptions (a questionnaire survey and interviews).

Observations focused on identifying whether barriers to handover identified in previous studies were relevant to shift handover between doctors in hospitals in the Czech Republic. The researcher was interested in finding whether or not the Czech Republic doctors encountered evidence-based barriers to handover, and focused on factors which could be observed, such as: (a) individual-performance related barriers such as not listening or interrupting;

or, (b) the physical environment-related barriers (context) such as high background noise levels or lack of a designated location for conducting handover. Conceptualised at the outset, these potential barriers to handover formed initial hypotheses that were then tested throughout the study and were included in an observation protocol. An example of a hypothesis would be: "If there is a noisy background, then conducting handover is difficult: a noisy background is a barrier to conducting shift handover effectively".

During observations, the researcher also paid attention to characteristics of participants and to artefacts they were using to convey information (communicate during handover). In addition, the researcher reflected on and made comments on doctors' body language and her impression of handover sessions. Observations of doctors' body language allowed the researcher to explore subtle aspects of handover related to the effects of interpersonal relationships on the process.

ORGANISING OBSERVATION SESSIONS

At each site, 6 brief observation sessions were conducted (3 in the morning, 3 in the afternoon or evening) and each session lasted approximately 30 minutes. Access to doctors was facilitated by the clinical director (Site 1) and the professor of neurology (Site 2) who sent an email inviting staff to participate in the familiarisation phase. The email contained information about the intended aims and objectives of the present study, the purpose and conduct of the familiarisation phase, and how it may affect their work. Due to ethical and pragmatic concerns (e.g. the plausible involvement/participation of patients; or the feasibility of isolating background noise to get good quality records) observation sessions were not digitally recorded. Since the content of handover was beyond the scope of the present study, records of handover sessions were not necessary to achieve the objectives of the present study.

CONDUCTING OBSERVATIONS

On arrival, the researcher was introduced to all members of staff present in the department (by the clinical director - Site 1 and the professor of neurology - Site 2). Prior to beginning observations the researcher introduced the present study, explained the purpose of the familiarisation stage and assured confidentiality. On all occasions the researcher observed a handover session silently, completing the observation protocol.

During the familiarisation stage the researcher also engaged in informal chats with doctors (N = 5) and hospital managers (N = 3). Those conversations facilitated: (1) exploring whether doctors and managers found barriers to shift handover identified in world-wide studies relevant to the context of handover in the Czech Republic; (2) checking the relevance of the focus of the present study, (3) generating initial hypotheses, and, (4) discussions about fieldwork.

LIMITATIONS OF OBSERVATIONS

During observations the researcher collected data of individuals being observed. As a result of being observed, individuals may change their behaviour, for example, behaving in ways they think 'correct' although not what they would normally do: this is an example of what is termed the Hawthorne Effect. However, individuals do not change things they are unaware of, and they carry on doing them. As such, there is still potential to gain unexpected and useful information.

Observations were an informal component of the study and while they helped the researcher to understand the context of handover and get an insight into how doctors communicate, they were excluded from the formal data analysis. A notable theme, however, which emerged from observations, was that doctors focused on being polite towards each other, but they rarely used any

documents to aid verbal communication. Furthermore, hospital managers expressed concern that doctors do not complete handover and patient records, despite their several attempts to address this problem.

3.6 AN OVERVIEW OF METHODS EMPLOYED

Table 3.1 presents an overview of research methods used in the present study. The details of methods, including justification for the use of selected methods, are described in respective chapters providing the details of each theory-testing phase, (Chapter 4: Theory-testing Phase I, A Critical Review of Literature; Chapter 5: Theory-testing Phase II, Questionnaire Survey; and Chapter 6: Theory-testing Phase III, Semi-structured interviews).

Table 3.1 Stages and components of the study, and how they provide answers to the research questions¹

STAGE	COMPONENT	ROLE (S) OF THE STUDY COMPONENT	PRACTICALITIES
Conceptualisation, including a familiarisation stage (Phase 0)	<p>(a) Establishing initial hypotheses to be tested throughout the study, and;</p> <p>(b) Specifying research questions.</p> <p>(c) Clarify the scope of the project.</p>	<p>This component was the first step in determining the scope of the study; establishing initial theories/hypotheses to be tested throughout the study; and, establishing research questions.</p> <p>This stage also included defining terms to be used throughout the investigation.</p>	<p>Cherry-picking review of literature.</p> <p>Reviewing the researcher's previous work on handover.</p> <p>The familiarisation phase (Phase 0): ! Familiarisation stage was not an actual stage of data collection.</p> <p>The familiarisation stage was conducted in two hospitals in the Czech Republic.</p>

¹ All stages of the present study were guided by the principles of critical realism.

			<p>This phase of the study (0) included the following components:</p> <p>(a) Brief observations of shift handover sessions, 6 at each site, and,</p> <p>(b) Informal chats with doctors (N = 5) and hospital managers (N = 3).</p>
Study design.		Deciding upon the most appropriate research methods for the research questions addressed in the study.	
<p>Theory-testing Phase I</p> <p>A critical theory-led literature review.</p>	A theory-led review.	<p>Phase 1 was the first theory-testing cycle of the initial hypotheses.</p> <p>In addition, the results of the literature review:</p> <ul style="list-style-type: none"> I. Provided evidence on whether and how the initial hypotheses were supported by the previous research. II. Provided background information. III. Provided information about the types of research on shift handover between doctors. IV. Informed the discussion of the quality of previous research on barriers to conducting shift handover between doctors. V. Informed the development of the Questionnaire Survey 	<p>Only primary research was included in the review.</p> <p>This phase of the study is called 'Phase 1' as this phase utilised evidence collected during previous primary research on barriers to conducting shift handover.</p> <p>Described below Phases II and III refer to empirical evidence collected during the present study.</p>

		(Theory Testing Phase II).	
Preparations.		<p>I. Seeking Ethical Approval.</p> <p>II. Seeking Research and Governance permission.</p> <p>III. Conduct preparatory work.</p>	<p>Preparatory work prior to the beginning of fieldwork including:</p> <p>I. Seeking Ethical Approval from Sheffield Hallam University's Research Ethics Committee.</p> <p>II. Seeking Hospital Governance Permission from Research and Developmental Departments at the hospitals.</p> <p>III. Organising the practicalities of data collection; e.g. visits to the hospitals (Site 1 and Site 2).</p>
Study instruments.	<p>To refine a questionnaire survey that was developed by the researcher in her previous work on handover.</p>	<p>Refine a questionnaire survey to be used to collect quantitative data regarding doctors' experiences and perceptions of the key barriers to effective communication at shift handover (Phase II).</p>	<p>Because the results of each stage of the present study informed the next stage, data collection tools were developed/adapted at different stages of the study.</p>

<p>Data Collection.</p> <p>Theory Testing Phase II:</p> <p>A Questionnaire Survey</p>	<p>A Questionnaire Survey on doctors' experiences and perceptions of the key barriers to effective shift handover communication between doctors.</p> <p>Addressing Research Question I.</p>	<p>This was the second circle of theory testing in the present study.</p> <p>The survey elicited the answer to the following questions:</p> <p>WHETHER OR NOT similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic.</p> <p>WHAT are the key barriers to shift handover communication and the extent to which barriers to shift handover communication between doctors identified in hospitals around the world are encountered by doctors working in hospitals in the Czech Republic.</p> <p>The findings from the quantitative The theory-testing Phase II informed the next phase of the study – the qualitative Phase III – semi-structured interviews with doctors.</p>	<p>This component of the study also involved determining a sample size, sampling strategy, the participants' selection and recruitment.</p>
<p>Data Collection</p> <p>Theory-Testing Phase III:</p> <p>Semi-structured interviews with</p>	<p>Semi-structured Interviews</p> <p>Addressing Research Questions II and III.</p>	<p>This was the third stage of theory testing included in this present study.</p> <p>This phase of the study facilitated exploring the causes of barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic.</p>	<p>This component of the study also included the participants' selection and recruitment.</p>

doctors			
Drawing inferences from the study, and establishing a final theoretical position	Discussion chapter included the analysis of the results of the study in the light of previous research (including studies not included in the critical review of literature)	Proposing a new theoretical position regarding, a number of hypotheses on how the social, systemic and environmental features that make up different contexts in which handover is conducted may collectively contribute to ineffective shift handover communication. Furthermore, this stage of the study included developing recommendations for: (1) future research, (2) practice, and, (3) patient safety policy.	Making interferences and drawing conclusions; this included, for example, conducting an additional search for relevant literature e.g. on handover as a teaching tool, to enhance the interpretation of the results of the study.
Dissemination of the research findings	Informing the participants, participating hospitals about the outcomes of the study as well as the Ministry of Health in the Czech Republic.	Publishing the findings from the present study.	Up until now one peer reviewed article has been published.

CHAPTER 4 THEORY-TESTING PHASE I - A CRITICAL REVIEW OF LITERATURE

4.1 INTRODUCTION

The critical review of literature was the first theory-testing phase undertaken for the purpose of this study in line with its realist methodology. As such, the review was a theory-led critical review rather than a question-led systematic review. In this phase, a critical appraisal of primary studies on barriers to effective shift handover communication between doctors at shift handover was performed in order to test the initial hypotheses established at the outset of the present study through exploring barriers to effective shift handover communication identified in hospitals around the world. The results of this phase formed both a new theoretical position, and the basis for the development of a data collection tool used in Phase II – the questionnaire survey.

The following sections describe the literature review process and the findings from the review.

4.2 METHODOLOGY

Although the review was not question-led, unlike systematic reviews of literature, a systematic review methodology was employed to assess the quality of the primary studies on barriers to effective shift handover communication between doctors. Employing a systematic review methodology ensured thorough coverage of the area as well as providing a means to judge the quality of research found.

The following section describes the process of searching and identifying research evidence.

4.3 METHODS USED

4.3.1 SEARCH STRATEGY

To develop the search strategy the researcher consulted an information scientist (MG) from the Centre of Health and Social Care Research (CHSCR), Sheffield Hallam University.

The search for evidence was preceded by the establishment of an operational definition of barriers to effective communication between doctors at handover. Barriers to shift handover communication were defined as describing any conditions, which predispose to ineffective shift handover communication between doctors.

Prior to the commencement of the actual search for evidence, the preliminary literature review was undertaken. The purpose of the preliminary review was to enhance the accuracy of the actual search (Jackson and Waters, 2005). Upon the completion of the preliminary search, the final search terms were established (see Table 4.1) whereas terms yielding irrelevant studies (see Table 4.2) were excluded. In addition, to enhance the sensitivity of searches in multidisciplinary databases such as Web of Science, additional search terms were employed (see Table 4.3).

Table 4.1 Literature search terms

Notion	Search Terms
Shift handover	handover* or hand-over* or "hand over*" *" handoff* or hand-off* or "hand off*" *" shift n3 change* "sign off*" or "signoff*" or sign-off* sign-out* or signout* signover* or sign-over* "end of shift" "roster change*" * "shift briefing*" * "patient transfer*" * "care n3 transfer*" * "information n3 transfer*" * "medical n5 transfer*" *
Barriers to shift handover communication	barrier* n5 communicat* breakdown* n3 communicat* obstruct* n3 communicat* negative* n5 communicat* adverse* n5 communicat* problem* n5 communicat* "poor communicat*" * obstacle* n3 communicat* fail* n3 communicat* inadequate n5 communicat* (MH "Communication Barriers")
Doctors – participants	doctor* physician*
Additional search terms to flag up barriers to communication	barrier* n5 communicat* (MH "Communication Barriers") / (same)

LEGEND: ADVANCED SEARCH TECHNIQUES

* - TRUNCATION CHARACTER FOR DIFFERENT WORD SPELLINGS

MH - MESH TERMS – THE MEDICAL SUBJECT HEADING

NN E.G. N3 - PROXIMITY, ALLOWING TO SEARCH FOR WORDS WITHIN A GIVEN NUMBER OF WORDS, THIS APPROACH ALLOWS TO ENHANCE THE SENSITIVITY AND SPECIFICITY OF THE SEARCH, ESPECIALLY IN FULL-TEXT DATABASES

TABLE 4.2 Terms excluded from searches

"Medication reconciliation" or "medication re-conciliation"*
Warfarin*
Paging*
"Case management"*
"Chronic disease"*
*Exclusions for all databases

TABLE 4.3 additional search terms used

(MH "Hospitals+")
hospital*
ward
"medical team"*
These terms were not used in Medline/CINAHL

In an attempt to identify studies to be included in the review the following databases were searched from inception to September 2012 for relevant studies: Medline (via EBSCOhost), CINAHL Plus with Fulltext (via EBSCOhost), PsycINFO (via CSA), Cochrane Database of Systematic Reviews, DARE, and CENTRAL (via Cochrane Library), Web of Knowledge, Scopus and EThOS (via British Library). The search strategies used text words and relevant indexing to capture the concept of communication barriers and handover. The searches in Web of Knowledge and Scopus additionally included text words to limit the results to the healthcare context.

Upon the completion of the study selection phase, ancestry searches, that is, the systematic reviews of citations (Conn et al., 2003), were performed. The

ancestry searches (backward searches) included scanning the reference lists of studies selected for inclusion for relevant studies.

In addition, the reference lists of included papers were assessed, and citation searches (forward searches) were performed in respect of these papers using the Web of Science and Google Scholar, to identify any additional relevant studies. Citation searches in Science Citation Index Expanded (SCI-EXPANDED) were carried out for papers citing those studies selected for inclusion that are indexed in the ISI Web of Science. Citation searches were performed in Google Scholar for the other studies selected for inclusion. Further ancestry and citation searches were carried out for studies selected for inclusion from the ancestry and citation searches. In total, five sets of citation searches were carried out.

The following websites were searched, where possible using the on-site search engines with search terms 'handoff', 'handover', etc.: World Health Organization (<http://www.who.int/en/>); Joint Commission (formerly Joint Commission on Accreditation of Healthcare Organisations (JCAHO)) (<http://www.jointcommission.org/>); National Center for Patient Safety (<http://www.patientsafety.gov/>); Agency for Healthcare Research and Quality (<http://www.ahrq.gov/>); Australian Commission for Safety and Quality in Healthcare (<http://www.safetyandquality.gov.au/>); National Patient Safety Agency (<http://npsa.nhs.uk/>) Royal College of Physicians (<http://www.rcplondon.ac.uk/>); and Scottish Patient Safety Programme (<http://www.patientsafetyalliance.scot.nhs.uk/programme>).

The searches were not limited by date, study design, or language of publication. That is, no language restriction was used, to avoid the possibility of language bias.

A search alert was set up so the literature searches could have been carried out throughout the lifecycle of the present study; the results of additional

searches were consolidated during the interpretation of the findings from the present study. The key authors were not contacted to check if they were aware of any relevant studies that could be included in the review. The preliminary and full strategies are shown in the Appendix 4.1.

Studies using the following study designs were eligible for inclusion in the review: randomised controlled trials (RCTs) and controlled trials, cohort, case series, case records and any other qualitative studies. Commentaries, literature reviews, meta-analysis etc. were excluded from the review; although before this current review commenced, the researcher checked if similar reviews had been conducted.

Studies, which were evaluated as relevant in the sifting process at the title or abstract stage, were subjected to an assessment against the exclusion/inclusion criteria (Table 3.3). During the study selection process the researcher identified both, relevant studies, which met and some, which did not meet inclusion criteria. Some of the relevant studies, which did not meet the inclusion criteria, were held back as potentially relevant for inclusion in the discussion of the findings [53]. The eligible studies were reviewed to check plausible multiple publications describing the same study results.

THE STUDY SELECTION PROCESS

Table 4.4 the application of the exclusion and inclusion criteria

Criteria	Inclusion	Exclusion
<u>Step 1:</u> Eligible study participants	<p>Doctors who work in hospitals.</p> <p>Doctors' seniority - all doctors (including junior doctors and residents were eligible for an inclusion in this current study).</p> <p>Doctors in postgraduate training (who have been practicing medicine for at least 6 months).</p>	Not doctors.
<u>Step 2:</u> Process	Communication between doctors at shift handovers which take place in hospital departments.	<p>Inter-service patient transfers, e.g. from a care home to hospital.</p> <p>Handover processes that takes place between paramedics (ambulance crew) and a clinical team in an Accident and Emergency Department.</p> <p>Inter-departmental handovers.</p> <p>Handovers involving a night float (not a primary care team).</p> <p>A handover process from a hospital to other residential setting.</p>
<u>Step 3:</u> Study type	<p>Studies eligible for inclusion:</p> <p>A primary study.</p>	Not a primary study.

<p><u>Step 4:</u> Study design</p>	<p>Studies eligible for inclusion:</p> <p>Cross-sectional study; cohort study, case study and randomised controlled trials.</p> <p>Intervention studies which included a pre-assessment of communication between doctors at shift handover.</p>	
<p><u>Step 5:</u> Other details</p>	<p>Barriers to effective communication between doctors at shift handover:</p> <ul style="list-style-type: none"> • Individual-related barriers; • Environment-related barriers; • The system-related barriers. <p>Investigating barriers does not need to be a primary objective of a study.</p> <p>Intervention studies which have included a pre-assessment of shift handover practices between doctors (which identified barriers to effective shift handover communication) were eligible for inclusion.</p>	<p>Studies exploring errors related to the content of handover were excluded if they did not evaluate the context in which shift handover communication occurs.</p> <p>The incompleteness of the information transfer was assumed to be a consequence of some communication or other barriers, but not to be a barrier <i>per se</i>. Therefore research studies, whose primary focus was the completeness of information transfer, were excluded from the review.*</p> <p>Research studies investigating the consequences of inadequate communication at handovers.</p>
<p>*Some of those research articles have provided useful background information.</p>		

4.4 APPRAISAL OF STUDIES INCLUDED IN THE REVIEW

A sound review requires the critical appraisal of the methodological quality of studies (Whittemore and Knafl, 2005; Cooper, 2010; Major and Savin-Baden, 2010). Therefore, studies included in the review were subjected to an appraisal of methodological quality. To assess the methodological quality of mixed-methods and quantitative studies, Guyatt's et al. (Guyatt, Sackett and Cook, 1994) appraisal tool was employed: "11 questions to help you make sense of descriptive/cross-sectional studies" (Guyatt et al., 1994). In addition, to appraise the quality of mixed-methods per se a number of selected mixed-methods appraisal items were used (Bryman et al., 2008). Finally, to appraise the methodological quality of qualitative studies the Critical Appraisal Skills Programme's (CASP's) appraisal tool "10 questions to help you make sense of qualitative data" was utilised.

4.4.1 STUDIES INCLUDED IN THE REVIEW

The final set of studies included in the review comprised eight primary studies (four quantitative, one mixed-methods and three qualitative). A flow diagram illustrated on the next page (Chart 4.1) illustrates the study selection process. The details of the studies included in the review are provided in Tables: 4.4a, 4.4b and 4.4c.

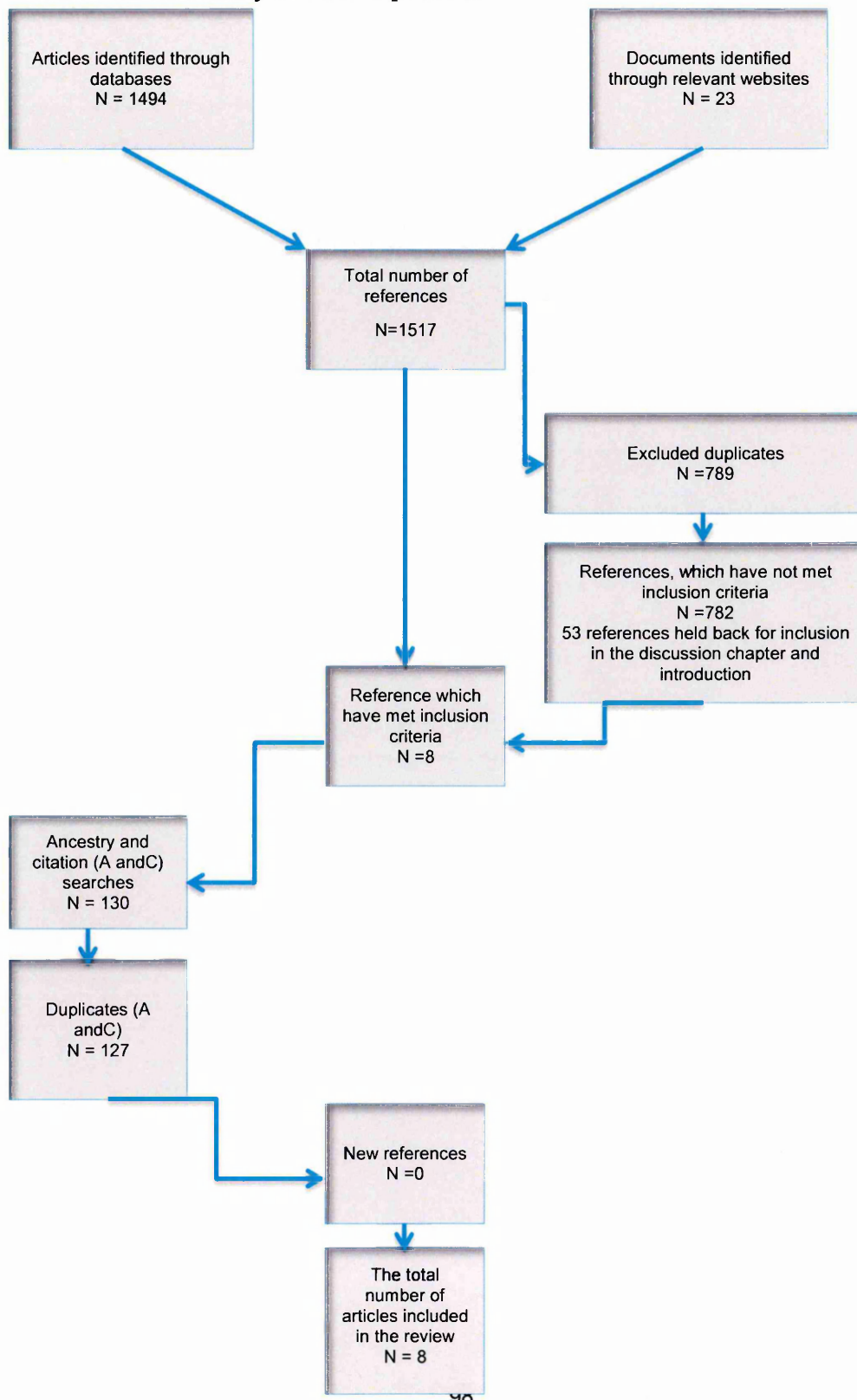
Chart 4.1 The study selection process

Table 4.5a Characteristics of quantitative studies

Study	Country	Title	Design	Type of doctors	Sample size
[1] Sinha et al. (2007)	USA	"Need for Standardized Sign-out in the Emergency Department: A survey of Emergency Medicine Residency and Pediatric Emergency Medicine Fellowship Program Directors".	<ul style="list-style-type: none"> • Cross-sectional • A questionnaire Survey • Primary Data Collection 	The EM programme clinical directors and paediatric ED fellowship clinical directors	185 clinical directors
[2] Maughan et al. (2011)	USA	"ED handoffs: observed practices and communication errors".	<ul style="list-style-type: none"> • Cross-sectional • The study included a questionnaire survey and observations of handover sessions 	Emergency Medicine doctors	110 shift handovers
[3] McSweeney et al. (2011)	USA	"Patient Handoffs: Pediatric Resident Experiences and Lessons Learned".	<ul style="list-style-type: none"> • Cross-sectional • A questionnaire Survey • Primary Data Collection 	Paediatricians	77 doctors
[4] Wheat et al. (2012)	USA	"An assessment of Patient Sign-Outs Conducted by University at Buffalo Internal Medicine Residents".	<ul style="list-style-type: none"> • Quasi-experimental intervention but it has included a pre-assessment of shift handover practices 	Residents [post grad medical training]	120 doctors

Table 4.5b Characteristics of a mixed-method study

Study	Country	Title	Design	Type of doctors	Sample size
[5] Bomba and Prakash (2005)	Australia	A description of handover process in an Australian public hospital.	Cross-sectional A mixed-methods study comprising: a questionnaire survey, interviews with doctors and observations of handover sessions.	Visiting Medical Officers (VMOs), Resident Medical Officers (RMOs), Staff Specialists (SSs), and, Junior Medical Officers (JMOs).	A questionnaire survey: 74 doctors Observations: unreported Interviews: unreported

Table 4.5c Characteristics of qualitative studies

Study	Country	Title	Design	Type of doctors
[6] Cleland et al. (2009)	UK	"There is a chain of Chinese whispers...": empirical data support the call to formally teach handover to prequalification doctors.	Focus groups	Foundation Year 2, Senior House Officers (SHO) and Specialist Registrars (SpR) doctors.
[7] Raduma-Tomas (2011)	UK	The importance of preparation for doctors' handovers in an acute medical assessment unit: a hierarchical task analysis.	Observations	Acute Medical Assessment Unit doctors
[8] Yang et al. (2011)	Singapore	Clinical shift handover in Singapore: A three - phase prospective	Semi-structured interviews	Junior doctors

4.4.2 THE ASSESSMENT OF METHODOLOGICAL QUALITY OF STUDIES INCLUDED IN THE REVIEW

The following sections describe the outcomes of the quality assessment of the studies included in the review. The review included four quantitative [1-4], one mixed-methods [5], and three qualitative [6-8] studies.

Microsoft Excel Spreadsheets were used to document the process of qualitative assessment. Those were then converted into the Word document tables. For more details please see Appendices: 4.2A, 4.2B and 4.2C.

The responses to screening questions ranged from 'yes', 'can't tell' to 'no'. The 'yes'/'can't tell'/'no' answers were respectively scored 1 and 0. In Tables 4.6A, 4.6B and 4.6C, to compare the quality of studies, scores were converted into percentages.

4.4.2.1 THE QUALITY OF QUANTITATIVE STUDIES

The appraisal of methodological quality of quantitative studies included in the review has revealed methodological shortcomings. The percentages of quality appraisal scores ranged from 5 [1] to 8 [2-4] (please see Tables 4.6A, 4.6B and 4.6C).

Table 4.6A Quality assessment of quantitative studies

Study		Rating ['yes' answers to questions included in the quality appraisal checklist]	Rating [%]
[1]	Sinha et al. (2007)	5/11	45%
[2]	Maughan et al. (2009)	8/11	72%
[3]	McSweeney et al. (2011)	8/11	72%
[4]	Wheat et al. (2012)	8/11	72%

Please see Appendix 4.2A for the details of the quality assessment of quantitative studies.

Three out of four quantitative studies presented doctors' experiences and perceptions of barriers to effective shift handover communication. All of the studies focused the investigation on a well-defined problem and used a relevant design (Screening questions 1 and 2). Regarding selection bias, one study reported employing convenience sampling [2], whereas all other studies [1, 3 and 4] failed to state explicitly a sampling method used. Other types of plausible selection biases observed in the studies included:

- Study 1: The questionnaire was distributed to the clinical directors at teaching hospitals (academic institutions), whose opinions of communication at handover could differ from those of clinical directors at hospitals, which had no affiliation with universities.
- Study 2: In addition to employing convenience sampling, which increases the likelihood of selection bias, the study failed to provide a comprehensive description of study participants such as demographic information such as doctors' length of experience.

Furthermore, despite the study included the observations of 110 shift handovers, accounting for the transfers of responsibility of 992 patients, the probability of selection bias cannot be eliminated, as the data were collected in one hospital department.

In addition, the data were not collected from two handover sessions taking place at night: "...the attending handoff at 1 a.m. and the resident handoff at 3 a.m. ... based on the very low number of handoffs anticipated" (p.504). Shift handover sessions taking place at night might differ from handover conducted at other times (e.g. during the daytime); excluding them from the study could have affected both, the type and quality of the collected data.

- Study 3: The participants were recruited from one hospital, which at the time of the study employed a handover system.
- Study 4: The sample represented the internal medicine residents who were seeking support to improve the quality of shift handovers, whose opinions could differ from the other, less Patient-Safety-aware doctors.

The external reliability criterion was appraised as not met in any of the studies [1-4]. That is, the findings from the studies were not generalisable to the defined population due to the following threats: small sample sizes and recruitment bias. All studies reported a response rate [1-4]. While a response rate in two studies was high (89%) [4], (59.3% and 71.1%) [3]; in one study it was relatively lower (55%) [1]. A high response rate reported by study 4 is unsurprising, since the participants themselves initiated the study.

None of the studies [1-4] provided evidence of testing for differences between those participants who completed and returned the questionnaire (respondents) and those who did not (non-respondents) (Screening questions 3).

With regard to measurement bias, three studies [1, 3 and 4] used a questionnaire survey to gather doctors' experiences and perceptions of communication at shift handover. While all of these studies provided a comprehensive description of questionnaire items, none of them presented evidence of its validity, or, the rationale for why they might consider the validation of the data collection instrument to be unnecessary. The authors of study 1 reported piloting the questionnaire but failed to describe further details.

Study 2 employed a prospective observational study design. The authors clearly defined an observational protocol used. Furthermore, they reported inter-observer agreement as 0.75 (95% CI, 0.72-0.78), calculated by Cohen's

kappa test to illustrate that the observational protocol was appropriate for measuring the handover process (reliability). In addition, the authors reported conducting a pilot study and training observers, but failed to describe further details. The remaining three studies [1, 3 and 4] failed altogether to report the reliability measures of the data collection instruments, that is, they failed to test whether the questionnaire survey measured what it was supposed to measure (Screening question 4).

All of the studies have clearly described methods used. Three studies used the questionnaire survey [1, 3 and 4]; and one study [2] used quantitative observations to collect the data [2]. None of the studies, however, discussed what alternative data collection methods could be used. Similarly, while all studies provided a comprehensive description of the setting for data collection [1-4], only one study [2] justified the data collection setting (Screening question 5).

As regards the precision of the results, only one study reported confidence intervals (CIs) [2], whereas in others CIs were unreported (Screening Question 8).

None of the studies [1-4] reported performing a power calculation.

With reference to chance, all of the studies described P values. Study 1 reported one statistically significant result; that is, the comparisons of responses provided by emergency programme directors [EPD] and paediatric fellowship programme directors [PFPD] revealed the agreement between the respondents that their institutions do not provide handover skills training (EPD 93.8% versus PFPD 68.3%, $p < 0.002$). Similarly, study 2 identified a couple of statistically significant results related to the content of handover (exploring the content of handover was beyond the scope of the present study). Study 3 described P values for three statistically significant findings

(the results of the pre-post evaluation of the intervention); however, the present review was concerned only with the results of the pre-assessment of handover practices (Screening question 6).

The findings were made explicit in all studies [1-4].

Furthermore, while the authors of all studies discussed the credibility of the findings [1-4], only one study [2] discussed evidence for and against the authors' arguments. Studies 1 and 3 presented a discussion of evidence for, but not against the study results. Study 4 failed altogether to discuss the findings in the light of relevant evidence (Screening question 9).

The methods employed in the studies could be used to explore handover practices in other settings. However, the reporting could be improved in all of the studies. The fact that the majority of the quantitative studies [1, 3 and 4] (Screening question 10) focused on exploring doctors' experiences and perceptions confirms that understanding the process from the participants' point of view is crucial to improving handover.

4.4.2.2 THE QUALITY OF A MIXED-METHOD STUDY

This section describes the assessment of the methodological quality of a mixed-methods study included in the review.

Table 4.6B Quality assessment of a mixed-methods study

Study		Rating ['yes' answers to questions included in the quality appraisal checklist]	Rating [%]
[5]	Bomba and Prakash (2005)	Quantitative component: Quality score 3/11	27.3
		Qualitative component: Quality score 5/10	50%
		MM Score 0.5/4	12.5%

Please refer to Appendix 4.2B for the details of the quality assessment of the qualitative and quantitative components of the mixed-method study.

Only one mixed-methods study was included in the review [5]. Its quantitative component was rated 27.3%, qualitative 50%, and the mixed-methods 12.5%. The results of its critical appraisal are outlined below.

It comprised a questionnaire survey, interviews, and observations of shift handover sessions. Although the study addressed a focused problem and used an appropriate design (Screening questions 1 and 2), the assessment of its methodological quality has raised a number of issues.

Regarding external reliability, the study was rated as not generalisable to other hospital settings as following threats to external reliability were identified:

- A small sample (77 out of 144 doctors completed and returned the questionnaire). In addition, while 49% of doctors did not return the questionnaire, the authors provided no evidence of examining differences between those doctors who completed and returned the questionnaire (respondents) and those doctors who did not (non-respondents).
- Selection bias with regard to the questionnaire survey, the authors provided a limited description of participants' recruitment: "the questionnaire was distributed to all medical staff who were thought to have direct involvement in the handover process during a 2-week period" (Bomba and Prakash 2005, p. 70), but failed to describe further details. Therefore, we cannot eliminate selection bias.

Furthermore, the study failed to provide evidence of performing a sample size calculation.

In addition, the study failed to adequately describe the qualitative data collection methods used (interviews, observations). For example, the

authors provided a description of an interview guide, but failed to report the number of interviews conducted.

As regards to observations, the authors reported observing shift handover sessions over a period of two weeks, but failed to describe further details.

Since no comprehensive descriptions of either sampling or recruitment approaches were provided, selection bias with regard to participant recruitment to the other two data collection methods, interviews and observations, cannot be eliminated. Overall the description of the data collection process was rated as inadequate. Moreover, the authors failed to discuss plausible alternative methods of data collection. (Screening questions 3 and 4).

As for the study instruments used, the authors failed to report the evidence of the validity and reliability of the questionnaire. While the authors reported pilot testing the questionnaire, they failed to describe further details (Screening question 5).

As regards to the precision of the results, confidence intervals (CIs) were unreported (Screening question 6) and the rigorousness of data analysis could not be evaluated, since the authors provided no relevant details (Screening question 7). Furthermore, the authors provided an insufficient discussion of the limitations of their study. On the other hand, when discussing the results of the study they referred to 6 previous publications presenting the evidence for the researchers' arguments (Screening question 8). The strength and weaknesses of each method used and a mixed-method approach itself was unaddressed (Screening question 9). The only limitation of the study, as identified by the authors, was a small sample size.

The Ethics Committee and the Chief Executive Officer and Head of Medical Services of the hospital approved the study (Screening question 10).

THE APPRAISAL OF MIXED-METHODS PER SE:

Initially, the O'Cathain's et al. (O'Cathain, Murphy and Nicholl, 2008) quality appraisal tool for mixed-methods studies was employed. However, since the study failed to report the majority of the quality items listed in the tool, a less sophisticated, 4-question appraisal tool was used (Bryman et al. 2008):

1. Presence of rationale for a mixed-methods design [1 score].
2. Relevance of a mixed-methods design to the research questions addressed in the study [1 score].
3. Transparency regarding the data collection and analysis procedures used [1 score].
4. Reporting of the integration of methods included in the study [1 score].

Total: 4 scores

Except for screening question 4, which, as discussed above, was answered partially, the authors failed to answer the other 3 screening questions [1-3]. Therefore, the study was rated as 0.5 score (very poor) in terms of its 'mixed-methods quality'.

In detail, the authors implicitly referred to employing a mixed-methods approach: "A qualitative and quantitative approach to the study was undertaken as it is the researchers' belief that the process of understanding a social or human problem is based on building a complex, holistic picture..." (Bomba and Prakash 2005, p.70). Furthermore, the authors reported that the findings from the questionnaire informed the development of an interview guide used in the study. However, they did not specify the role of observations, which were conducted before and after other data collection

methods. The results of each method were described in sequence and integrations between different phases of the study were not made explicit.

4.4.2.3 THE QUALITY OF QUALITATIVE STUDIES

The percentages of quality appraisal of qualitative studies included in the review ranged from 50% to 80%.

Table 4.6C Quality assessment of qualitative studies

Study		Rating ['yes' answers to questions included in the quality appraisal checklist]	Rating [%]
[6]	Cleland et al. (2008)	7/10	70%
[7]	Raduma-Tomas (2011)	8/10	80%
[8]	Yang et al. (2011)	5/10	50%

Please refer to Appendix 4.2C for the details of the quality assessment of qualitative studies.

The purpose of the studies was clearly described, and the choice of a study design was rated as appropriate in all studies (Screening questions 1 and 2). Furthermore, methods employed in the studies were made explicit. All three studies employed semi-structured interviews [6-8]; in addition, in one study [6] interviews were supplemented with other data collection methods, focus groups and observations (Screening question 3).

The recruitment strategy was rated as 'adequate and described in detail' in two studies [6-7], and in the other as 'described partially' [8], as the authors failed to describe how the participants were recruited (Screening question 4).

All the studies provided a comprehensive description of the setting for data collection [6-8]. However, in one study [6] only the process of data collection was rated as meticulous, in the other two as sufficiently rigorous [7], and in one as poor [8] (Screening question 5).

Regarding saturation, only one study provided a limited discussion of data saturation [6], whereas the other two failed to do so altogether [7-8].

Two studies [6-7] discussed the expertise of their teams in collecting qualitative data. In study 6, which employed three qualitative methods of data collection, the authors provided a clear description of the role(s) of each method and their integration (triangulation) [6].

Regarding bias, all the studies failed to include the critical examination of the authors' role in the research process, or their plausible impact on any stage of the study [6-7]. (Screening question 6).

As concerns ethical standards, these were rated as sufficient in study 6, as acceptable in study 7, and as inadequate in study 8 as the authors failed to provide any information about ethical issues [8] (Screening question 7).

With regard to the data analysis process, it was rated as very good in one study [7] and poor in the other two [6 and 8]. In addition, no contradictory findings were reported in any of the studies [6-8] and the authors failed to discuss reflexivity (Screening question 8).

In terms of making the findings explicit, this task was accomplished in all of the studies [6-8]. However, only in one study [7] did the authors present a comprehensive discussion of their findings in the light of previous research. In the two other studies [6 and 8] the discussion of the results was limited to presenting arguments supporting the authors' claims (Screening question 9).

Only in two studies [6 and 7] did the authors discuss contributions their study made to the understanding of handover practices (Screening question 10).

4.4.3 SECTION SUMMARY

The systematic search for primary research revealed a scarcity of studies focusing on effective communication between doctors at shift handover. This finding is surprising, considering a plethora of handover improvement projects identified through sifting research studies for inclusion in this review [53]. One may raise a question: how can we develop an effective improvement intervention if we do not understand both the context and process of handover. However, the discussion on this topic is beyond the scope of the present study.

Although the majority of the studies included in the review were rated as having made a significant contribution to the literature, their critical appraisal revealed a number of quality issues. The following section describes barriers to effective communication between doctors at shift handover, which emerged from the literature. These barriers were contrasted with the initial hypotheses to establish a new set of hypotheses. This new set of hypotheses was then tested during the second theory-testing phase included in the present study - a questionnaire survey (Phase II).

BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION IDENTIFIED IN PREVIOUS EMPIRICAL STUDIES

For clarity, the barriers identified in previous empirical studies are divided into three categories: those related to the individual, the environment, and the system. We shall discuss them in turn:

1) INDIVIDUAL PERFORMANCE

Individual performance-related barriers identified in the studies included a lack of diligence in completing handover and patient records, and during verbal communication. Errors/mistakes or omitted handover content could result in adverse consequences, for example, either important information being omitted, or, incorrect/inaccurate information being communicated during handover. Both omitted and inaccurate information may lead to confusion regarding a patient's clinical condition and the choice of an appropriate treatment.

Experience is another individual performance-related factor which may play an important role in determining handover effectiveness. Doctors at different levels of expertise, with work experience of varied length, as well as doctors in different specialties may have different expectations of which and how much information should be conveyed. During handover, participants may or may not convey sufficient relevant information to enable their handover counterpart to create a mental model of a patient's current condition; for example, less experienced clinicians may convey different information during handover than more experienced clinicians. Indeed, the review identified that junior doctors might face difficulties in recognising essential information for the provision of a patient's care, which should be conveyed during handover. More experienced clinicians, on the other hand, may fail to transfer enough clinical information for less experienced clinicians to understand a patient's case, which could be perceived by junior doctors as omissions of important

information. These differences in doctors' behaviour during handover could arise, for example, from their different perceptions of handover definition (purpose).

Another important barrier related to information omission was doctors' inability to chase down (i.e. contact, although the idiom is telling) a doctor on duty during the previous shift, if the essential information about a patient's condition was unavailable. However, while doctors' inability to communicate with a doctor who was on duty during the previous shift might be due to doctors' behaviour (e.g. finishing early to go home) it might also be due to organisational and system factors, e.g. doctors have only very limited time to communicate during handover information about a high volume of patients.

Another individual-performance related barrier to handover, identified in the studies, was lack of communication skills. Furthermore, in relevance to social interactions between doctors, hospital work appears to be hierarchical and both formal and informal authority structures affect the handover process. Social relationships between colleagues may have a negative impact on handover; for example hierarchy has been found to have a detrimental effect on the process. Therefore, communication during shift handover involving junior and senior doctors, that is, doctors at different levels of seniority/experience might be ineffective.

In addition, the lack of doctors' participation in a handover discussion and lack of feedback that information was accurately received have been identified as a significant obstacle to effective handover communication.

While some of the above mentioned barriers to handover might be due to individuals' skills and behaviours, they might also arise from the hospital environment and system. The hospital context comprises both

environmental and system factors, some of which might have a negative impact on effective shift handover communication.

II) ENVIRONMENTAL FACTORS

Another group of factors that have an impact on handover relate to the physical environment in which the process occurs. Environmental obstacles to handover included interruptions, distractions arising, for example, from handover being conducted in a common, busy area due to lack of designated handover location, where doctors could communicate with no interruptions. Indeed, the environmental barriers to handover discussed in the studies included a high background noise level arising from other staff, patient care, phone calls and pager beeps.

III) SYSTEM FACTORS

The environmental barriers to handover seemed to be heavily affected, by hospital systems and the review revealed a number of the system-related barriers to handover. The most frequently cited in studies system-related barrier to handover appeared to be lack of time, arising, for example, from heavy workloads. The other system-related barrier identified in the studies was lack of guidelines and training in how doctors should communicate during handover; this makes learning on the job the main source of knowledge. This lack of standards, together with inadequate communication between colleagues seemed to be the cause of blurred transfer of responsibility for a patient's care. Blurred responsibility for care is likely to negatively affect work arrangement and while this barrier may seem trivial, it may not be, if we consider the potential negative consequences of health care not being provided on time to critically ill patients.

Table 4.7 illustrates barriers to effective communication at shift handover identified in the critical review of literature as well as hypotheses arising from

them. In details, Column B presents barriers identified in the literature in a form of a quote, word or a sentence. Column C describes hypotheses arising from the identified barriers. For example, if an identified barrier was 'handover conducted in a common area is a barrier', 'emerging' hypotheses could be: 'a lack of a designated place is a barrier to effective shift handover communication'; 'interruptions are a barrier to effective shift handover communication', or, 'Busy periods in the department or the hospital are barriers to effective shift handover communication.'

Table 4.7 The key barriers that emerged from the literature and how these have been converted into hypotheses to be tested during the second theory-testing phase

A Study	B Barriers identified in the critical review of literature	C Hypotheses established from the barriers*
The results of quantitative studies		
ED handoffs: observed practices and communication errors.	Interruptions (other staff, patients)	Interruptions
	Doctors do not actively participate in handover	Not listening and interrupting Doctors do not actively participate in handover
	Participants do not listen	Not listening As above, doctors do not actively participate in handover
	Omitted items of the handover content	Important information is not conveyed during handover, resulting, for example, in out of date handover reports
	Lack of feedback (6.1% of doctors provided feedback)	Doctors' do not provide feedback to confirm that handover content was accurately received As above, participants do not actively participant in handover Poor communication skills
	Discrepancies between verbal handovers and handover written records/incorrect recalled information during verbal handover	Incorrectly recalled information – doctors provide wrong information during a handover discussion; this may also mean that they do not refer to any sources of written information Irrelevant medical information is provided at handover

Need for Standardized Sign-out in the Emergency Department: A Survey of Emergency Medicine Residency and Pediatric Emergency Medicine Fellowship Program Directors	Transfer of responsibility is unclear	The division of responsibility is unclear
	Handover conducted in a common area	Handover is conducted in a common area Interruptions High background noise level
	"Transfer of attending responsibility at shift change: rarely documented 79 (42.9%)" p. 194	Blurred transfer of responsibility/The division of responsibility is unclear
	Lack of guidelines on how handover should be conducted	The absence of guidelines on how handover should be conducted
	Lack of handover training	Lack of training
Patient Handoffs: Pediatric Resident Experiences and Lessons Learned	Interruptions (e.g. paging, nursing, and phone interruptions)	High background noise levels A lack of designated place for handover communication
	High workload	High workload Long working hours Poor workforce planning
	Not updated records - "Almost 73% of all intern and resident respondents noted that they had experienced uncertainty in the past regarding a patient care plan because of receiving an incomplete verbal handoff". p. 59) and sign-outs were not reflective of current patient information and care plans	Messy records Illegible handwriting records Out-of-date reports
	Lack of time	Lack of time
An assessment	Interruptions	Interruptions

of Patient Sign-Outs Conducted by University at Buffalo Internal Medicine Residents	Doctors are in a hurry to go home	Doctor who was on duty during the previous shift is unavailable Doctors/participants do not actively participate in handover
	Lack of up-to-date information - written records are not updated	Out-of-date reports
	Irrelevant information documented in handover records	Out-of-date reports
	Lack of feedback	Lack of feedback Poor communication skills
	Lack of time	Lack of time Poor workforce planning Busy periods in the department/hospital
	High patient load	High volume of patients Poor workforce planning
	Lack of handover training	Lack of handover training
	Junior doctors do not receive sufficient instructions; (no instructions is given on how to communicate effectively during handover)	Lack if guidelines on how to communicate effectively during handover
The results of a mixed-methods study		
A description of handover process in an Australian public hospital - mixed methods	No indication of main concerns	Information that may be relevant to the patient's condition has not been communicated/Information that may be relevant to the patient's condition is unavailable
	Not updated records (information was either not transferred or transferred	Out of date records or messy records (as info may not be updated or it may not 'difficult to find' among other

	verbally only)	irrelevant information)
	Illegible records	Messy and illegible reports
	Incorrect information transferred	Irrelevant medical information is provided during handover Incorrectly recalled information
	Not being able to find a doctor who was on duty during the previous shift - "being able to identify patients of concern and locating the replacement doctor)	Follow up queries and a doctor who was responsible for the patient during the previous shift is not available
The results of qualitative studies		
Raduma-Tomas (2011)	The patient list is not updated (which summarises information for each patient) "...the junior doctors preparing handover did not always perform the necessary steps of collating key patient information (i.e. checking the status of investigations)... p. 215 Information omissions Lack of time Staff shortages High volumes of patients	Not updated records Handover between junior members of staff/ Communication with junior/more senior members of staff Information that may be relevant to the patient's condition is unavailable Lack of time Staff shortages
	When missing information is not captured during the handover meeting with the step-down team junior doctor this post-handover may sought to resolve it by returning to ask doctors on duty during the previous shift - before they make a decision about how to prioritize a patient's care during the next shift	Follow up queries and a doctor who was responsible for the patient during the previous shift is unavailable Information that may be relevant to the patient's condition is unavailable
	Lack of time	Lack of time
	Staff shortages	Staff shortages

		Long working hours
	"Junior doctors felt they were not provided with sufficient information about individual patient circumstances or which patients to prioritise..." (p.268).	Insufficient information is provided during handover - handover content is missing Important handover content is missing
	The experienced doctors believed that junior doctors find it challenging to elicit the key information and that junior doctors lack professionalism	Difficulties in recognizing which information is essential for the provision of a patient's care and should be conveyed during handover Communication with junior/more senior members of staff Handover between junior members of staff (as if senior doctors are absent, handover communication between junior doctors is unlikely to be effective)
	Differences between junior and senior doctors' perceptions of the definition of handover	Involvement of junior and senior doctors, handover involving junior and senior doctors
	High volumes of patients Lack of questioning, lack of feedback - which also suggests poor communication skills	High workload Lack of communication skills Lack of feedback
Cleland et al. (2008)	Differences between junior and senior doctors' perceptions of the definition of handover: "Junior doctors felt they were not provided with sufficient information about individual patient circumstances or which patients to prioritise..." p.268. The experienced doctors believed that junior doctors find it challenging to elicit the key information and that junior doctors lack professionalism. Doctors learned how to conduct handover	Handover involving junior and senior doctors Learning handover on the job, lack of

	<p>on the job, via trial and error and this method of learning was perceived as "not necessarily reliable" p. 269.</p> <p>Environment/System-related barriers to handover</p> <p>Lack of time, too many patients, lack of handover training</p>	<p>an informal handover training - lack of formal handover training</p> <p>Lack of time</p> <p>High volume of patients/heavy workload, lack of handover training</p>
Yang et al. (2011)	Doctors do not update documents	Not updated records
	High workload	High workload/Long working hours
	Lack of time	Lack of time
	Handover conducted over the telephone	
	"Environmental noise" (p.781) / interruptions	
	Lack of a designated place to conduct handover	A lack of designated place for handover communication
	Important handover content is omitted	Information that may be relevant to the patient's condition is unavailable

*Explanatory hypotheses – regarding plausible underlying structures and mechanisms related to individual performance, work environment and system in which shift handover communication takes place.

4.5 A SUMMARY OF THE THEORY-TESTING PHASE I

In theory-testing Phase I, a critical appraisal of empirical studies on barriers to effective shift handover communication between doctors was performed in order to test the initial hypotheses established at the outset of the present study. The new theoretical position/hypotheses on barriers to effective shift handover communication between doctors that emerged from the first theory testing phase of the present study (first iteration) were as follow:

HYPOTHESES TAKEN FORWARD AS PLAUSIBLE FROM THEORY-TESTING PHASE I

HYPOTHESES TAKEN FORWARD AS PLAUSIBLE FROM PHASE I

(1) INDIVIDUAL-RELATED BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS

Messy records (e.g. inconsistent use of terminology; use of graphical symbols that are not commonly used).

Illegible records.

Out of date records.

Poor communication skills.

Not listening and interrupting.

Irrelevant information is provided during handover (incorrectly recalled information).

Difficulty in recognising which information is essential to the provision of patient care.

Handover involving junior doctors is a barrier to handover (Lack of capabilities, skills and experience).

(2) SOCIAL CONTEXT-RELATED BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS

Handover communication with more junior/senior doctors.

Handover involving junior and senior doctors.

Disagreements between doctors regarding a medical diagnosis.

Poor communication skills (e.g. doctors do not use any strategies to enhance the effectiveness of communication such as asking questions, providing feedback, repeating the key information to ensure that it has been accurately understood).

(3) WORK ENVIRONMENT- (PHYSICAL ENVIRONMENT) AND THE SYSTEM-RELATED BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS

Interruptions (high background noise level).

Handover conducted in a common area/A lack of a designated (private and quiet) place to conduct handover.

High background noise levels.

Long working hours.

Staff shortages.

Not enough time/ busy periods in the department.

Information that may be relevant to the patient's condition is unavailable.

The division of responsibility is not clear.

Lack of training in how to communicate effectively at shift handover

Handover is unstandardized.

Insufficient Information Technology (IT) support.

The key topics to be included in handover discussion are not defined.

Handover log or another structured protocol is not used.

Relevant patient documentation is not present during handover discussion.

Essential clinical information for a patient's care delivery is unavailable at the time of handover
e.g. tests results are unavailable/relevant patient data are unavailable at the time of handover.

These new hypotheses, taken forward as plausible from the critical review of literature, were further tested during theory-testing Phase II, a questionnaire survey. The main aims of Phase II were to explore doctors' experiences and perceptions of whether they encounter barriers to effective shift handover communication identified in hospitals around the world, and their perceptions of the key barriers to effective shift handover communication. As such, the questionnaire was developed from the Phase I data. Phase II is described in the next chapter (Chapter 5).

CHAPTER 5 THEORY-TESTING PHASE II

QUESTIONNAIRE SURVEY

5.1 INTRODUCTION

This chapter reiterates the aim and objectives of Phase II (Section 5.2); describes the process of developing the questionnaire survey (Section 5.3), provides the details of sampling approached used and data collection (Section 5.3), describes the process of data analysis (Section 5.4); illustrates the key findings from the present study (Section 5.5) and finally, it concludes with the description of hypotheses taken forward as plausible, to be tested in Phase III (Section 5.6).

5.2 THE AIM AND OBJECTIVES OF PHASE II

A cross-sectional, self-administered questionnaire survey was employed to elicit the Czech Republic doctors' experiences and perceptions of whether or not they encounter similar barriers to effective shift handover communication between doctors identified in hospitals around the world and their perceptions of the key barriers to effective shift handover communication. The survey was developed from hypotheses taken forward as plausible from Phase I. The further aim of the quantitative Phase II was to identify patterns and tendencies, in which various factors and mechanisms may coalesce to generate ineffective shift handover communication between doctors; this was done in accordance with the principles of critical realism. In detail, the questionnaire was used to:

- (a) Identify which factors (barriers to effective shift handover communication identified in hospitals around the world and perceived by doctors, as barriers to effective shift handover communication, related to individual performance, work environment and system, were statistically significant.
- (b) Identify which barriers to effective shift handover communication between doctors were identified by more than 70% of respondents; if so, it was considered to be an important barrier to effective shift handover communication.
- (c) Compare responses provided by junior and middle grade (<15 years of work experience), and, senior (> 15 years of work experience) doctors. Fifteen (15) years was chosen as the transition because it was identified as such by doctors in the familiarisation stage of the project.
- (d) Identify any statistically significant correlations between factors/variables (related to individual performance, environment, organisation and system) perceived by doctors as barriers to handover; that is, correlations illustrating tendencies and patterns in which those factors coalesce to generate ineffective shift handover communication.

5.3 THE DEVELOPMENT OF THE SURVEY INSTRUMENT

The questionnaire survey was created by the researcher and included sections on: barriers to conducting handover arising from individual-performance, work environment and system factors; information about how doctors learned about conducting shift handover, whether or not they had undergone any formal training. The questionnaire also enquired about the length of clinicians' experience of working in their current position and the nature of their employment [full time/part time]. The questionnaire items

(potential barriers to shift handover communication between doctors) represent the barriers identified through the critical review of literature.

5.3.1 OPERATIONALISATION OF BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS

The final version of the survey included sections on barriers to conducting handover arising from individual performance-, work environment- and system-related factors. The questionnaire section on barriers examined doctors' level of agreement or disagreement with whether or not a factor impeded their ability to conduct shift handover effectively and included two main categories: (i) individual performance-related factors, and, (ii) work environment- and system-related factors.

The individual performance-related factors section enquired about the quality of completion of patient records (e.g. messiness or records being out-of-date). Furthermore, this section asked about factors related to the doctors' overall performance during handover and included questions about the impact of difficulty in recognising which information is essential for patient care, poor communication skills, including interrupting and not listening, and communication with a more senior/junior doctor.

The work environment and system factors section included questions pertaining to the impact of interruptions, lack of a designated place, high background noise levels, long working hours, staff shortages, not enough time, busy periods in the department and poor workforce planning. The questionnaire also enquired whether doctors had undergone any formal training in how to communicate during shift handover.

The core question items, related to how selected factors contributed to the effectiveness of handover, formed a four-point Likert scale and included all items included in the questionnaire (e.g. factors related to individual

performance, work environment and system). Levels of agreement regarding potential barriers to shift handover were recorded on a four-point Likert scale, with responses ranging from “Strongly Agree” to “Strongly Disagree”. The questionnaire can be found in Appendix 5.1.

5.3.2 THE VALIDITY OF THE QUESTIONNAIRE SURVEY

The validity of a questionnaire survey is a function of its quality as a research instrument in measuring what it is supposed to measure; this is sometimes also called dependability (Hansen, 1979; Wainer and Braun, 1998; Joppe, 2000; Winter, 2000). To ensure the validity of the questionnaire, the construct validity, including the face and content validity was examined. Face validity refers to whether or not the questionnaire appears to measure what it supposed and whether it ‘makes sense’. To measure and to explore the face validity the researcher can inquire about whether or not the questionnaire items are phrased appropriately or whether the options for responding to questionnaire items seem suitable. Content validity, on the other hand, refers to the accuracy of the accuracy of the questionnaire item. Content validity can be explored through consulting with experts the accuracy of the questionnaire items.

To ensure face and content validity, the questionnaire items were drawn from research evidence (taken forward as plausible from the critical review of literature), and pilot data collected through the familiarisation phase (e.g. the question of whether or not the Czech Republic doctors receive any training in how to conduct shift handover/communicate during shift handover as the familiarisation phase revealed a wide diversity of handover forms).

Although the survey was not validated it was pilot tested by four doctors for its: (a) clarity (whether the wording of the survey was understood in the same way by different doctors), and (b) applicability to the handover context in the

Czech Republic hospitals. After the pilot consultation, doctors suggested amendments to a couple of questionnaire items, that is, to merge two questionnaire items 'handover conducted in a common area is a barrier to effective shift handover communication' and 'a lack of designated place is a barriers to effective shift handover communication' into one: 'a lack of designated place to conduct handover'.

The reliability refers to whether or not the responses to the questionnaire given by the respondent were consistent. The consistency of the results delivered in the survey, was demonstrated via internal consistency reliability test; the value of test-retest-reliability coefficient was 0.8.

Further steps were taken to enhance both face and content validity of the questionnaire. Face validity relates to the extent to which seems to fulfil its objectives whereas content validity pertains to clarity and relevance of the questionnaire items (Lynn, 1986), that is, in case of the present study, if the questionnaire included questions which represented various dimensions of communication between doctors at shift handover.

5.4 SAMPLING AND DATA COLLECTION

Participants in the questionnaire survey included all doctors working in the following units at the two sites (site 1 and site 2): internal medicine, general surgery, gynaecology, neonatal care, neurology, orthopaedics, renal, urology and obstetrics, where handover was a routine practice for doctors. At the time of the study there were approximately 100 doctors employed in the selected departments at site 1 and 112 doctors at site 2. There were no exclusion criteria for participation as the intention was to capture a full range of doctors' experiences and perceptions.

5.4.1 SAMPLE SIZE CALCULATION

The target sample was 212 doctors, which represented the total population of doctors working in selected hospital departments. This would enable the calculation of 95% confidence intervals (CIs) around percentage agreement on a factor to within a maximum of $\pm 6.7\%$. These CIs were based on the assumption that the doctors at the two sites were representative of the Czech Republic hospital doctors.

The true proportion of people strongly agreeing/agreeing (P) was estimated with 95% confidence as:

$$P = p \pm 1.96 \text{ se}(p) \sqrt{\frac{N-n}{N-1}}$$

Where p is the estimated proportion from the sample, based on the Normal approximation to the binomial (because the sample is large), where n is the sample size and N is the population size.

($\sqrt{\frac{N-n}{N-1}}$ was called the finite population correction factor).

$$\text{se}(p) = \sqrt{\frac{p(1-p)}{n}}$$

which takes a maximum value of $\frac{0.5}{\sqrt{n}}$ when $p=0.5$.

So the maximum margin of error is $1.96 \times \frac{0.5}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}$

So for Doctors at Site 1 the proportion agreeing/strongly agreeing with any particular barrier was estimated with 95% confidence to lie within a maximum margin of error of:

$$1.96 \times \frac{0.5}{\sqrt{69}} \times \sqrt{\frac{100 - 69}{100 - 1}} = 0.066 = 6.6\%$$

As p in the present study was large, the margin of error was smaller.

The sample size calculation for Doctors and Site 1 and Site 2

$$1.96 \times \frac{0.5}{\sqrt{181}} \times \sqrt{\frac{212 - 181}{212 - 1}} = 0.0279 = 2.79\%$$

It was estimated with 95% confidence that responses would be within $\pm 2.8\%$ maximum margin of error.

5.4.2 DATA COLLECTION

Phase II was conducted between April and May 2011.

Participants were invited to participate in Phase II by the clinical director (Site 1), the quality manager (Site 2) and the researcher (Sites 1 and 2). Both a letter and an email were sent to doctors inviting them to participate in the survey. The participant invitation letter (Appendix 5.2) and the email contained information about the current study and how the issue of confidentiality would be dealt with. One week later the researcher handed out to doctors an envelope consisting of an invitation letter, a study information sheet (Appendix 5.3), questionnaire survey and an empty envelope. To ensure the anonymity of the survey, doctors were asked to return completed surveys anonymously via internal post to a pigeonhole in the porters' lodge at each site (Sites 1 and 2). Email reminders were sent one week and two weeks after the initial distribution of the survey. The recruitment procedure was alike for all doctors including those who did and those who did not participate in the familiarisation phase.

5.4.3 SAMPLE CHARACTERISTICS

As it was previously mentioned (Section 5.2), in order to profile the respondents, the survey enquired about doctors' socio-demographic characteristics such as length of their work experience and the nature of their employment (full-time/part-time). To preserve anonymity it was considered inappropriate to request any further demographic information.

Length of the respondents' work experience ranged from 1 to 42 years (mean 14 years, SD 10.1). All respondents were employed full-time.

5.4.4 RESPONSE RATE

A total of two hundred and twelve questionnaires were distributed to doctors across the two hospitals. One hundred and eighty-one completed questionnaires were returned; that constituted an exceptional response rate of 85.3%. It is believed that the high response rate was achieved due to encouragement and support doctors received from their managers, including free time to complete the questionnaire.

TABLE 5.1 RESPONSE RATE

	No Q distributed (%)	No Q returned (%)
Doctors	212 (100)	181 (85.3)

One hundred and eighty-one doctors completed the questionnaire, missing only very few items.

TABLE 5.2 SENIORITY PROFILE: YEARS OF EXPERIENCE WORKING IN HOSPITAL

	No Q returned (%)
Less experienced doctors (<15 years)	96 (56.5)
More experienced doctors (≥15 years)	74 (43.5)

5.4.5 MISSING DATA

Missing data were minimal with, at maximum, three missing values for any question regarding barriers to effective shift handover communication between doctors. Where responses have been dichotomised as “Agree/Strongly Agree” and “Disagree/Strongly Disagree”, respondents with a missing value for a given question have been incorporated in the “Disagree/Strongly Disagree” category, so the “Agree/Strongly Agree” category represents the minimum level of agreement. The Likert scale responses regarding potential barriers to handover were collapsed (Allen and Seaman, 2007) to a dichotomy: “Strongly Agree/Agree” and “Disagree/Strongly Disagree”, to reduce any difference in extreme response bias and simplify analysis.

Eleven respondents preferred not to answer the question relating to their length of experience; this may be due to the risk of compromising their anonymity. These respondents have been disregarded when comparing more and less experienced doctors and therefore excluded from Table 5.2.

The next section describes the details of data analysis.

5.5 STATISTICAL ANALYSIS

A number of data analyses were used to elicit the key results of the quantitative Phase II: (a) Descriptive statistics in the IBM Statistical Package

for Social Sciences (SPSS Version 18.0); (b) The Chi-Square test; (c) The Clopper-Pearson interval; (d) the Kendall's Tau-b correlation coefficient; and (e) Fisher's Exact test. The details of these quantitative analyses, including their purposes, are described below.

(a) Doctors' perceptions of whether or not they encounter similar barriers to effective shift handover communication identified in hospitals around the world and their perceptions of the key barriers to effective shift handover communication, and answers to the question whether or not they had undergone any formal training in how to communicate during handover, were elicited using descriptive statistics in the IBM Statistical Package for Social Sciences (SPSS Version 18.0).

(b) The presence of differences between less and more experienced doctors' perceptions of whether or not they encounter similar barriers to effective shift handover communication identified in hospitals around the world and their perceptions of the key barriers to effective shift handover communication was determined using the Chi-Square test. That is, A Chi-Square test was used to explore whether length of doctors' work experience affected their perceptions of barriers to effective shift handover communication. This comparison of responses from less (<15 years) and more (≥ 15 years) experienced doctors was undertaken, as the familiarisation stage of the present study had suggested that handover is learned on the job. A hypothesis was drawn therefore that doctors' experiences and perceptions change as they gain work experience. Fifteen (15) years was chosen as transition because it was identified as such by (senior) doctors in the familiarisation stage of the project.

A Chi-Square test was used as categorical values for variables which were mutually exclusive and the minimum expectation of 5 variables occurred in each category (Berenson, Levine and Krehbiel, 2012). While the test allowed the researcher to estimate differences in responses, it did not specify their

strength. This, however, was not important, since the purpose of this phase of the study was to identify factors, mechanisms and structures which generate ineffective shift handover communication (which included further testing of hypotheses taken from Phase I); but the research was not intended to either establish the strength with which those mechanisms and mechanisms operate, or, the strength of association between them.

To compare responses provided by less and more experienced doctors, the null hypothesis to be tested was that there are no differences between less and more experienced doctors' perceptions of whether or not they encounter similar barriers to effective shift handover communication identified in hospitals around the world, and of barriers to effective shift handover communication; an alternative hypothesis was that these differences exist.

(c) Clopper-Pearson confidence intervals were used to identify those barriers to effective shift handover communication, which elicited significantly more than 70% agreement overall; that is, 70% or more doctors agreed or strongly agreed that a factor was a barrier to effective shift handover communication.

(d) Statistically significant correlations between factors/variables, related to individual performance, environment and system, perceived by doctors as barriers to effective shift handover communication were identified through the Kendall's Tau-b analysis. Correlations showed potential tendencies and patterns in which factors coalesce to generate an ineffective shift handover.

The items analysed were arranged into 2 'scales' plus one single item, each item being assessed on a 4-point Likert scale (rated from 1-Strongly Agree to 4-Strongly Disagree): two scales (1-2) relating to perceived impact on doctors' ability to communicate effectively during shift handover: (1) Effect of individual-related factors on doctors' ability to communicate effectively during shift handover; (2) Effect of work environment and system factors on doctors'

ability to communicate effectively during shift handover. A third scale was analysed that related to experience.

(e) Fisher's Exact test was used to examine whether or not doctors from the two Sites identified the same barriers to effective communication at shift handover.

5.6 THE KEY FINDINGS FROM THE THEORY-TESTING PHASE II

As all the statements in the first 2 scales of data analysis (effect of individual-related, work environment and system factors on doctors' ability to communicate effectively during shift handover) were anticipated to be factors influencing doctors' ability to communicate effectively during handover, as they could be either barriers or facilitators. As such, it was instructive to look, in the first instance, at those factors with which doctors disagreed or strongly disagreed that they could impede effectiveness of shift handover communication; those are presented in Table 5.3.

TABLE 5.3 PERCENTAGES OF DOCTORS WHO DISAGREE OR STRONGLY DISAGREE THAT A PARTICULAR FACTOR PRESENTS A BARRIER TO EFFECTIVE COMMUNICATION AT SHIFT HANDOVER

Item	Percentage disagreed or strongly disagreed that this factor affected communication (or more that 11% strongly agreed*)
Difficulty in recognising which information is essential for the patient's care	40.9% (12.2% strongly disagreed)
Disagreements between clinicians regarding medical diagnosis	40.3%
Participants do not actively participate in a handover discussion	39.8%
Irrelevant medical information is provided during handover	39.4% (15% strongly disagreed)
Busy periods in the department/hospital	36.4%
Communication with junior/more senior members of staff	35.2% (14.0% strongly disagreed)
A lack of designated place for handover communication	35%

Not listening and interrupting	34.8%
Staff shortages	33.7%
Incorrectly recalled information	33.2%
Item	Percentage disagreed or strongly disagreed that this factor affected communication (or more that 11% strongly agreed*)
Long working hours	28.2%
Tests results that may be relevant to the patient's condition are not available	26.2%

NOTES: * PERCENTAGE (%) OF DOCTORS WHO STRONGLY AGREED THAT A FACTOR IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION IS PRESENTED IN BRACKETS. RESPONSES WERE INCLUDED IN THE TABLE IF MORE THAN 11% OF DOCTORS WHO COMPLETED THE QUESTIONNAIRE STRONGLY DISAGREED THAT A FACTOR IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION.

Conversely, the following items presented in Table 5.4 elicited a high level of agreement amongst respondents, that is, doctors believed that the following items present barriers to effective shift handover communication.

TABLE 5.4 PERCENTAGES OF DOCTORS WHO AGREED OR STRONGLY AGREED THAT A PARTICULAR FACTOR IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION

Item	More than 85% Agreed or Strongly Agreed (or more than 25% Strongly Agreed)
Messy and illegible reports	97.8% (62.4% strongly agreed)
Illegible records	96.7% (59.1% strongly agreed)
Out of date reports	95.6% (38.7% strongly agreed)
Information that may be relevant to the patient's condition is not available	89.5% (43.6% strongly agreed)
The division of responsibility is unclear	86.2% (37.0% strongly agreed)
Follow up queries and a doctor who was responsible for the patient during the previous shift is not available	82.3% (29.8% strongly agreed)
Not enough time	81.8% (46.4% strongly agreed)
Communication with more senior/junior members of staff (doctors)	79.6% (27.1% strongly agreed)
Busy periods in the department/hospital	78.9% (42.2% strongly agreed)
Interruptions	76.2% (43.6% strongly agreed)
Poor communication skills	75.0% (42.2% strongly agreed)
Long working hours	71.8% (34.8% strongly agreed)
A lack of designated place for handover communication	65.0% (28.9% strongly agreed)

5.6.1 A COMPARISON OF RESPONSES PROVIDED BY LESS AND MORE EXPERIENCED DOCTORS

Similar levels of agreement were recorded for responses provided by less and more experienced doctors (please see Tables 5.5 and 5.6). The analysis revealed agreements in responses provided by the two groups of doctors, except for the following items, for which the null hypothesis was rejected: more experienced doctors disagreed that: (a) information, such as test results that may be relevant to the patient's condition, is unavailable (Pearson Chi-Square 4.517, $df = 1$, $p = .034$; less experienced doctors: Agree/Strongly Agree $n=65$, Disagree/Strongly Disagree $n=31$; more experienced doctors Agree/Strongly Agree $n=60$, Disagree/Strongly Disagree $n=13$); and (b) that out of date records present the barrier to effective communication at shift handover (Person Chi-Square 5.285, $df = 1$, $p = 0.022$; less experienced doctors: Agree/Strongly Agree $n=95$, Disagree/Strongly Disagree $n=1$; more experienced doctors: Agree/Strongly Agree $n=68$, Disagree/Strongly Disagree $n=5$).

TABLE 5.5 PERCENTAGES OF DOCTORS WHO AGREED OR STRONGLY AGREED THAT AN INDIVIDUAL PERFORMANCE-RELATED FACTOR PRESENTS A BARRIER TO EFFECTIVE COMMUNICATION AT SHIFT HANDOVER. RESPONSES DIVIDED ACCORDING TO DOCTORS' YEARS OF EXPERIENCE

Number (%) agreeing or strongly agreeing	Total (n=181)(%)	Less than 15 years of experience (n=96)(%)	15 or more years of experience (n=74)(%)
Messy records	177 (97.8)	94 (97.9)	72 (97.3)
Illegible records	175 (96.7)	92 (95.8)	73 (98.6)
Out-of-date records	173 (95.6)	95 (99.0)	68 (91.9)
Communication with more senior/junior members of staff (doctors)	144 (79.6)	78 (81.3)	55 (74.3)
Poor communication skills	135 (74.6)	74 (77.9)	52 (70.3)
Not listening and interrupting	118 (65.2)	63 (65.5)	49 (66.2)
Irrelevant medical information is provided during handover	109 (60.2)	57 (54.9)	47 (63.0)
Disagreements between clinicians regarding medical diagnosis	108 (59.7)	55 (57.3)	46 (62.2)
Difficulty in recognising which information is essential for patient care	107 (59.1)	57 (54.9)	43* (58.1)

NOTES: THE VALUES MARKED * ARE THE ONES WHERE THERE IS NO EVIDENCE THAT THE POPULATION PROPORTION IS NOT 50% (I.E. NO EVIDENCE OF AN OPINION ONE WAY OR THE OTHER). THE 11 EXTRA DOCTORS IN THE TOTALS ARE THOSE WHO DID NOT GIVE THEIR LENGTH OF EXPERIENCE. NO ASTERISK INDICATES NO STATISTICALLY SIGNIFICANT DIFFERENCES BETWEEN OPINIONS OF LESS AND MORE EXPERIENCED DOCTORS.

1 – STATISTICALLY SIGNIFICANT DIFFERENCE IN THE PERCEPTIONS OF LESS AND MORE EXPERIENCED DOCTORS:

$$\chi^2 (1) = 4.517, p=0.034$$

2 - STATISTICALLY SIGNIFICANT DIFFERENCE IN THE PERCEPTIONS OF LESS AND MORE EXPERIENCED DOCTORS:

$$\chi^2 (1) = 5.3, p=0.02$$

TABLE 5.6 PERCENTAGES OF DOCTORS WHO AGREED OR STRONGLY AGREED THAT AN ENVIRONMENTAL AND/OR ORGANISATIONAL FACTOR PRESENTS A BARRIER TO EFFECTIVE COMMUNICATION AT SHIFT HANDOVER. RESPONSES DIVIDED ACCORDING TO DOCTORS' YEARS OF EXPERIENCE

Number (%) agreeing or strongly agreeing	Total (n=181)(%)	Less than 15 years of experience (n=96) (%)	15 or more years of experience (n=74) (%)
The division of responsibility is unclear	156 (86.2)	84 (87.5)	63 (85.1)
Not enough time	148 (81.8)	81 (84.4)	57 (77.0)
Poor workforce planning	147 (81.2)	79 (82.3)	59 (79.7)
Busy periods in the department/hospital	142 (78.5)	77 (81.1)	54 (73.0)
Interruptions	138 (76.2)	71 (74.0)	58 (78.4)
Long working hours	130 (71.8)	73 (76.0)	49 (66.2)
Staff shortages	120 (66.3)	67 (69.8)	46 (62.2)
Lack of a designated place for handover communication	117 (64.6)	64 (66.7)	48 (65.8)
High background noise levels	75* (41.4)	40* (41.7)	30* (40.5)

NOTES: THE VALUES MARKED * ARE THE ONES WHERE THERE IS NO EVIDENCE THAT THE POPULATION PROPORTION IS NOT 50% (I.E. NO EVIDENCE OF AN OPINION ONE WAY OR THE OTHER). THE 11 EXTRA DOCTORS IN THE TOTALS ARE THOSE WHO DID NOT GIVE THEIR LENGTH OF EXPERIENCE. NO ASTERISK INDICATES NO STATISTICALLY SIGNIFICANT DIFFERENCES BETWEEN OPINIONS OF LESS AND MORE EXPERIENCED DOCTORS.

5.6.2 A COMPARISON OF EXPERIENCES AND PERCEPTIONS OF BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION HELD BY DOCTORS FROM THE TWO SITES

Fisher's Exact test was used to check whether or not doctors from the two Sites held different perceptions regarding barriers to effective shift handover communication. The findings revealed differences in that the larger percentage of doctors from Site 2 strongly agreed or agreed that factors such as out-of-date records 112 (100%), messy records 112 (100%), illegible records 109 (97.3%), poor communication skills 89 (80.2%), communication with more senior/junior members of staff 89 (79.5%), not listening and interrupting 82 (73.2%), irrelevant medical information is provided during handover 75 (67.6%), difficulty in recognising which information is essential for patient care 69 (61.6%), and disagreements between clinicians regarding medical diagnosis 69 (61.6%).

TABLE 5.7 COMPARISON OF RESPONSES PROVIDED BY DOCTORS WORKING AT THE TWO SITES. INDIVIDUAL-PERFORMANCE RELATED BARRIERS TO EFFECTIVE COMMUNICATION AT SHIFT HANDOVER.

Number (%) agreeing or strongly agreeing	Total (n=181)	Site 1 (n=69)	Site 2 (n=112)	p-value†
Out-of-date records**	173 (95.6)	61 (88.4)	112 (100)	<0.001
Not listening and interrupting **	118 (65.2)	36 (52.2)	82 (73.2)	0.006
Irrelevant medical information is provided during handover *	109 (60.2)	34(49.3)	75 (67.6)	0.019
Messy records*	177 (97.8)	65 (94.2)	112 (100)	0.020
Poor communication skills	135 (74.6)	46 (66.7)	89 (80.2)	0.052
Difficulty in recognising which information is essential for patient care	107 (59.1)	38 (55.1)	69 (61.6)	0.437
Disagreements between clinicians regarding medical diagnosis	108 (59.7)	39 (56.5)	69 (61.6)	0.535
Communication with more senior/junior members of staff (doctors)	144 (79.6)	55 (79.7)	89 (79.5)	0.563
Illegible records	175 (96.7)	66 (95.7)	109 (97.3)	0.676

NOTES: THE VALUES MARKED * ARE THE ONES WHERE THERE IS NO EVIDENCE THAT THE POPULATION PROPORTION IS NOT 50% (I.E. NO EVIDENCE OF AN OPINION ONE WAY OR THE OTHER). THE VALUES MARKED ** INDICATE STATISTICALLY SIGNIFICANT RESULTS. NO ASTERISK INDICATES NO STATISTICALLY SIGNIFICANT DIFFERENCES BETWEEN OPINIONS OF LESS AND MORE EXPERIENCED DOCTORS.

THE 11 EXTRA DOCTORS IN THE TOTALS ARE THOSE WHO DID NOT GIVE THEIR LENGTH OF EXPERIENCE.

TABLE 5.8 COMPARISON OF RESPONSES PROVIDED BY DOCTORS WORKING AT THE TWO SITES. ORGANISATIONAL- AND SYSTEM-RELATED BARRIERS TO EFFECTIVE COMMUNICATION AT SHIFT HANDOVER

Number (%) agreeing or strongly agreeing	Total (n=181)	Site 1 (n=69)	Site 2 (n=112)	p-value†
The division of responsibility is unclear	156 (86.2)	57 (82.6)	99 (88.4)	0.278
Poor workforce planning	147 (81.2)	46 (66.7)	101 (90.2)	<0.001
Staff shortages	120 (66.3)	36 (52.2)	84 (75.0)	0.002
Long working hours	130 (71.8)	41 (59.4)	89 (79.5)	0.006
Interruptions	138 (76.2)	46 (66.7)	92 (82.1)	0.020
Lack of a designated place for handover communication	117 (64.6)	37 (54.4)	80 (71.4)	0.024
Not enough time	148 (81.8)	52 (75.4)	96 (85.7)	0.112
Busy periods in the department/hospital	142 (78.5)	50 (73.5)	92 (82.1)	0.190
High background noise levels	75* (41.4)	26 (37.7)	49 (43.8)	0.441

NOTES: † FISHER'S EXACT TEST HAS BEEN USED THROUGHOUT

NOTES: THE VALUES MARKED * ARE THE ONES WHERE THERE IS NO EVIDENCE THAT THE POPULATION PROPORTION IS NOT 50% (I.E. NO EVIDENCE OF AN OPINION ONE WAY OR THE OTHER). NO ASTERISK INDICATES NO STATISTICALLY SIGNIFICANT DIFFERENCES BETWEEN OPINIONS OF LESS AND MORE EXPERIENCED DOCTORS. THE 11 EXTRA DOCTORS IN THE TOTALS ARE THOSE WHO DID NOT GIVE THEIR LENGTH OF EXPERIENCE.

5.6.3 BARRIERS TO AN EFFECTIVE SHIFT HANDOVER SIGNIFICANTLY GREATER THAN 70% OVERALL

Another goal of the quantitative analysis was to identify which barriers to effective shift handover communication between doctors were significantly greater than 70% overall, that is, $\geq 70\%$ of doctors agreed or strongly agreed that a given factor presents a barrier to conducting an effective shift handover. Identifying which perceived barriers were significantly greater than 70% was undertaken to establish the key barriers to effective shift handover communication.

To calculate respondents' statistically significant agreement equal or greater than 70%, the Clopper-Pearson 'exact confidence interval' for a binomial proportion (π) was adjusted to 0.7 (Clopper and Pearson, 1934). The adjustment of a binomial proportion (π) to 0.7 allowed to calculate degree of certainty that in the sample of doctors who completed the questionnaire, at least 70% of them believed that a factor presents a barrier to effective shift handover communication. These agreements were required to be statistically significant ($p \leq 0.5$).

H_0 Proportion in agreement is less than 70%

H_1 Proportion in agreement is ≥ 70

The results are presented in Table 5.9.

TABLE 5.9 PERCENTAGE OF DOCTORS IN AGREEMENT IS $\geq 70\%$ THAT A PARTICULAR FACTOR IS A BARRIER TO EFFECTIVE COMMUNICATION AT SHIFT HANDOVER

Item	% of doctors who agreed/strongly agreed (n = number of doctors who responded to a question)
Information that may be relevant to the patient's condition is not available	89.5 (N=181)
There are follow up queries and a doctor who was responsible for the patient during the previous shift is not available	82.3 (N=181)
Messy records	97.8 (N=181)
Illegible records	96.7 (N=181)
Out of date records	85.6 (N=181)
Communication with more senior/junior doctors	79.6 (N=181)
Poor communication skills	75.0 (N=180)
Not enough time	81.8 (N=181)
The division of responsibility is unclear	86.2 (N=181)
Busy period in the department/hospital	78.9 (N=180)
Interruptions	76.2 (N=181)
Poor workforce planning	81.2 (N=181)

NOTES: THE SIGNIFICANCE LEVEL IS .05

A few items did not reach 70% or above statistical significance level and were therefore not included in Table 4.11., these were:

- Test results that may be relevant to the patient's condition are unavailable: p value = 0.034 (N=169; Missing=12). Agree/Strongly Agree = 93.4%

- Long working hours: p value= 0.325 (N=18; Missing=0).
Agree/Strongly Agree = 71.8%
- Staff shortages: p value = 0.157 (N =181; Missing = 0).
Agree/Strongly Agree = 66.3%

Kendall's Tau-b correlation analysis was used to identify any statistically significant correlations between factors perceived by the respondents as barriers to conducting shift handover (related to individual performance, environment and system) perceived by doctors as barriers to handover. These correlations illustrate tendencies and patterns in which factors may coalesce to generate ineffective shift handover communication. Kendall's Tau-b represents a probability that the observed variables are or are not in the same order (Gibson, 1993). That is, it allows to detect associations and it is calculated as an excess of concordant over discordant pairs, divided by numbers representing the geometric mean between "the number of pairs not tied on pairs not tied on X (X_0) and the number not tied on Y (Y_0)" (Gibson, 1993):

$$Tau-b = (C - D) / \text{SQRT} [(C + D + Y_0)(C + D + Y_0)]$$

Below are listed factors for which strength of a correlation, R Pearson's correlation equal or was greater than 0.4 ($R \leq 0.4$). Afterwards, factors are listed for which the researcher would expect to see correlations, for example these factors identified by the respondents as the key barriers to conducting an effective shift handover, but which were not significantly correlated to other factors.

The analysis revealed the following anticipated correlations between a numbers of variables:

Theme	Correlation	Strength of correlation
Information that may be relevant to the patient's condition is unavailable	Follow up queries and a duty doctor during the previous shift is unavailable	$R^1 = .451^{**}$ $p = .000$ $n = 179$

Notes: $^1 = R$ Pearson's correlation

Theme	Correlation	Strength of correlation
Poor workforce planning	Long working hours	$R = .527^{**}$ $p = .000$ $n = 181$

Notes: $^1 = R$ Pearson's correlation

Theme	Correlation	Strength of correlation
Follow up queries and a duty doctor during previous shift is unavailable	Unavailable information	$R = .451^{**}$ $p = .000$ $n = 179$

Notes: $^1 = R$ Pearson's correlation

Theme	Correlation	Strength of correlation
Staff shortages	Long working hours	$R = .427^{**}$ $p = .000$ $n = 181$

Notes: $r^1 = R$ Pearson's correlation

Theme	Correlation	Strength of correlation
Busy periods in the department	Not enough time	$R = .400^{**}$ $p = .000$ $n = 180$
	Irrelevant information is provided during handover	$R = .400^{**}$ $p = .000$ $n = 180$

Notes: $r^1 = R$ Pearson's correlation

The analysis revealed that 'unavailability of information' was correlated with the presence of 'the follow up queries and unavailability of a duty doctor during the previous shift' $R^1 = .451^{**}$. 'Poor workforce planning' with 'long working hours' $R = .527^{**}$; 'staff shortages' with 'long working hours' $R = .527^{**}$; the presence of the follow up queries and unavailability of a duty doctor during the previous shift was correlated with unavailable information $R = .451^{**}$; 'busy periods in the department' was correlated with 'not enough

time' $R = .400^{**}$; and 'busy periods in the department' with 'irrelevant information is provided during handover' $R = .400^{**}$.

The identified correlations between a number of variables may represent patterns and tendencies, plausible interplays between barriers, in which factors and mechanisms may coalesce to generate ineffective shift handover communication between. However, the number of correlations revealed by the analysis was limited.

Notably, no correlations have been identified in relation to 'unclear division of responsibility', for example, the researcher anticipated that unclear division of responsibility could be correlated with 'unavailable information' or with 'follow up queries and a duty doctor during the previous shift is unavailable'.

A notable theme that has emerged from the analysis was that the overall level of correlations was small, which may indicate lack validity of the questionnaire.

5.7 A SUMMARY OF THE THEORY-TESTING PHASE II

In Phase II of this mixed-methods study, the questionnaire survey was conducted to explore doctors' experiences and perceptions of whether they encounter barriers to effective shift handover communication identified in hospitals around the world, and their perceptions of the key barriers to effective shift handover communication.

The results of the theory-testing phase II have revealed that similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic. As regards doctors' experiences and perceptions of the key barriers to effective shift handover communication, the key barriers are listed below under two categories: (i) the inadequacies of the healthcare

system including a disruptive working environment; and (ii) the individual performance-related barriers.

5.7.1 EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE HEALTHCARE SYSTEM INCLUDING A DISRUPTIVE WORKING ENVIRONMENT

In relation to work environment and system factors, respondents felt that their ability to conduct handover was impeded by: not enough time; poor workforce planning; busy periods in the department/hospital; and interruptions. In addition, more than half respondents, “Strongly Agreed” or “Agreed” that long working hours, staff shortages and the lack of a designated place for handover communication affect their ability to conduct handover, as illustrated in Table 4.6. Regarding response to potential system barriers, those doctors with less experience (<15 years) were significantly more likely to agree that not having enough time was a barrier to conducting an effective handover, but only marginally. On other potential barriers, similar levels of agreement were reached.

Furthermore, the analysis revealed overwhelming agreement between doctors that they had not undergone any formal training in how to communicate during handover, which we can interpret as a significant barrier to effective shift handover communication, since the absence of training suggests that doctors learn about how to conduct handover on the job.

5.7.2 EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INDIVIDUAL-PERFORMANCE RELATED BARRIERS

With reference to individual performance-related factors, the analysis revealed overwhelming agreement between less and more experienced

doctors as to the most important obstacles to handover: messy reports; illegible and out-of-date records; communication between more senior/junior members of staff; and poor communication skills. Messy records refer to disorganised records, where information is scattered and illegible records describe records that are impossible or difficult to read. Agreement between respondents' opinions was considered as 'overwhelming' when more than 70% of them "Agreed/Strongly Agreed" than an item was a barrier.

Furthermore, to a lesser extent, doctors believed that the following were obstacles to handover: interrupting and not listening; difficulty in recognising which information is essential for patient care; the provision of irrelevant clinical information during handover.

As statistical analyses have revealed similar levels of agreement were recorded for responses provided by less (<15 years) and more (≥15 years) experienced doctors, differences in their perceptions of the key barriers to effective shift handover were not further explored in the third, qualitative phase of the present study.

The following hypotheses were taken forward as plausible from Phase II:

HYPOTHESES TAKEN AS PLAUSIBLE FROM THEORY-TESTING PHASE II

(1) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE HEALTHCARE SYSTEM INCLUDING A DISRUPTIVE WORKING ENVIRONMENT

- Unclear division of responsibility.
- Not enough time.
- Poor workforce planning.
- Busy periods in the department/hospital.
- Lack of training in how to conduct handover.

(2) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INDIVIDUAL PERFORMANCE-RELATED BARRIERS

- Messy, illegible and out-of-date records.
- Difficulty in recognising which information is essential for patient care.
- The provision of irrelevant information during shift handover.
- Difficulty in communicating with more senior/junior members of staff.
- Poor communication skills.
- Interrupting and not listening.

These new hypotheses, taken forward as plausible from Phase II, were further tested during theory-testing Phase III, semi-structured interviews with doctors. The main aim of Phase III was to explore their experiences and perceptions of the causes of the key barriers between doctors working in hospitals in the Czech Republic and the intention was to discover causal tendencies, including factors, mechanisms and structures. As such, the interview schedule was developed from the Phase II data. Phase III is described in the next chapter (Chapter 6).

CHAPTER 6 THEORY-TESTING PHASE III: INTERVIEWS WITH DOCTORS

6.1 INTRODUCTION

This chapter describes the details of the qualitative phase of the present study, including: the rationale for employing semi-structured interviews (Section 6.2); sampling methods (Section 6.3), data collection (Section 6.4), and data analysis (Section 6.5). The chapter concludes with the summary of the hypotheses taken forward as plausible from Phase III (Section 6.6).

6.2 THE QUALITATIVE APPROACH EMPLOYED IN THE PRESENT STUDY

6.2.1 THE PURPOSE OF PHASE III AND THE RATIONALE FOR USING SEMI-STRUCTURED INTERVIEWS

The purpose of the qualitative Phase III was to further test hypotheses, which were taken forward as plausible from Phase II through examining doctors' experiences and perceptions of the causes of the key barriers to effective shift handover communication between doctors. Phase III also explored doctors' experiences and perceptions of the role(s) and importance of shift handover communication. Interviewees' understanding of the role of handover helped elicit the characteristics of an 'ideal' handover, deviations from which were considered to be barriers to conducting the process effectively.

The rationale for exploring doctors' experiences and perceptions was as follows; individuals' perceptions determine their reasoning which in turn affects their behaviour, for example, doctors' perceptions of handover

communication affect how they behave during the process. This implies that doctors' behaviour is embedded in mechanisms and structures, which may generate ineffective shift handover communication. It follows that handover, as a manifestation of behaviour may be complex since the hospital environment may affect handover communication in a variety of ways. A questionnaire survey is unlikely to capture all its nuances and complexities, which represent the handover context which may generate ineffective shift handover communication. Interviews, rather than focus groups, were used to collect qualitative data, as patient safety is the area where social pressure could lead respondents to be reluctant to disclose their experiences.

Semi-structured interviews represent efforts to identify either information or expressions of individuals' experiences and perceptions (Davis, 1980, p.218) (Cresswell, 2003 p. 12). Because the purpose of Phase III was to refine and explain the quantitative results, a semi-structured interview method was used (Ritchie and Lewis, 2003). Consequently, interviews in the present study comprised a combination of fixed and open-ended questions. In addition, the researcher used probes and prompts to draw out comprehensive and relevant answers. However, the reader should be aware that the interviews evolved in line with realist principles. For example, in later interviews the concept of 'messiness' in records developed from simple illegibility to notions such as redundancy and lack of coherence.

6.3 SAMPLING

6.3.1 SAMPLING METHODS

Initially, the quantitative results were used to select a purposive sample of participants (Lincoln and Guba, 1985). Purposive sampling is used when researcher has a clear idea about how participants may contribute towards explaining a research problem (Silverman, 2004; Lincoln and Guba, 1985).

Purposive sampling is compatible with a mixed methods sequential explanatory design as, for example, the results of the quantitative Phase II can inform a purposive selection of interviewees (doctors) to participate in the qualitative Phase III. For example, the findings from the questionnaire could reveal significant differences between junior and senior doctors' perceptions of the key barriers to effective shift handover communication; if that would be the case, the aim of the purposive sampling would be to recruit the same number of junior and senior doctors to explore the plausible causes of those differences. In the present study, the questionnaire survey revealed no significant differences in perceptions of the key barriers to effective shift handover communication between junior and senior doctors. The purpose of an initial purposive sampling approach was, therefore, to recruit doctors with varied length of work experience, as it would allow the exploration of the perceptions of doctors with a wide range of experiences and perceptions.

6.3.2 SAMPLE SIZE

The interview sample comprised 14 doctors, of which six were junior, and eight senior. The number of interviews was not set at the outset, as according to the principles of realist research, interviews are used as forums in which to test ideas and theories. Once theories were tested the researcher stopped recruiting new participants. This realist approach contrasts with the widely used approach of 'saturation', which tends to be allied to research premises on Grounded Theory principles.

6.3.3 ELIGIBILITY CRITERIA

To be eligible for inclusion, doctors were required to be fluent in either Polish or English. In one region where the study was conducted (Hospital 1) many doctors were fluent in Polish as in this part of the Czech Republic there is a large Polish speaking community. Many of those citizens having attended

Polish schools; in addition some doctors graduated from Polish medical schools. Doctors interviewed at Site 2 were fluent in English [Site 2 was in a large city University hospital].

6.4 DATA COLLECTION

6.4.1 RECRUITMENT METHODS

Two approaches were used to recruit the interviewees: (i) the researcher identified a number of potential interviewees during the familiarisation stage; also, (ii) the researcher asked the clinical director (Site 1) and the research manager (Site 2) to forward an email inviting doctors to take part in an interview. The email invitation comprised an interview information sheet (Appendix 6.1) and a template consent form (Appendix 6.2). Seven doctors responded to the email (3 at Site 1 and 4 at Site 2) and agreed to participate in the interview. Further interviewees were then recruited using a snowball sampling approach (Bryman, 2008). Snowball sampling involves asking study participants to recruit interviewees from among their colleagues (Bryman, 2008). Through snowball sampling, a further seven interviewees were recruited. A snowball sampling approach is a subcategory of purposive sampling and is therefore compatible with it.

6.4.2 INTERVIEW METHODS

Potential participants could choose to be interviewed either by telephone or face-to-face and the decision about whether to conduct a face-to-face or a telephone interview was guided by doctors' availability. Eight interviews were conducted face-to-face and six over the telephone. Those doctors who were interviewed face-to-face were offered a choice of an interview location, so they could feel comfortable and at ease while sharing their experiences and perceptions. In addition, doctors were offered a choice of having their

interview at times most convenient for them, either during or outside of working hours. All but one telephone interview were conducted outside of doctors' working hours.

Doctors who decided to take part in a face-to-face interview expressed a wish to be interviewed at their workplace. At Site 1 interviews were conducted in a Head Nurse's office and Quality Manager's office. At Site 2 interviews were conducted in a conference room.

6.4.3 AN INTERVIEW SCHEDULE

The majority of items on the interview schedule concerned the key barriers to effective shift handover communication identified in Phase II. In addition, the interview schedule included questions about doctors' experiences and perceptions of the role(s) and importance of handover. The interview schedule was piloted on one doctor (over the telephone) and a couple of peer researchers (NN and JT). The interview schedule can be found in Appendix 6.3.

6.4.4 CONDUCTING INTERVIEWS

The interview commenced by introducing the research problem, research questions, and the outline of the interview content. Before each interview commenced, an interviewee was given an opportunity to raise any concerns and ask questions. Furthermore, doctors were informed that they could terminate an interview at any time; this was done in accordance with the 'ethics as process' approach (Ramcharan and Cutcliffe, 2001). In addition, prior to beginning the interview the researcher also addressed the issues of anonymity and confidentiality and asked participants to sign a consent form. If the interview was conducted over the telephone, participants were required to provide informed consent via email prior to the interview.

The researcher then began the interview with an open question about doctors' perceptions and insights into the role(s) of handover, followed by questions about the key barriers to conducting handover identified in Phase II. During interviews doctors were asked to reflect back on their experiences rather than to speculate what could have happened. This was done to facilitate exploring various factors, mechanisms and structures, which may lead to ineffective shift handover communication.

The interviews were digitally recorded and written notes were taken during or immediately after the interview. This included short notes, which were used as the basis for more comprehensive comments about the content and process of the interview.

Interviews lasted from 25 minutes to 3 hours (with an average length of 40 minutes) and were conducted between June and August 2011.

6.4.5 ADVANTAGES AND DISADVANTAGES OF TELEPHONE AND FACE-TO-FACE INTERVIEWS

Both, face-to-face and telephone interviews carried a number of advantages and disadvantages, as discussed below:

6.4.5.1 LEARNING FROM INTERVIEWEES' BODY LANGUAGE

Face-to-face interviews facilitated learning from doctors' body language. During some interviews, non-verbal communication made it possible for the researcher to identify what doctors might have felt (Opdenakker, 2006), in different handover scenarios. This opportunity to learn from body language was absent from telephone interviews.

6.4.5.2 *RETAINING ANONYMITY*

An advantage of telephone interviews is that participants can preserve a high level of anonymity (Sturges and Hanrahan, 2004). Previous research revealed that discussing sensitive topics might be easier during telephone rather than face-to-face communication (Sturges and Hanrahan, 2004). Similarly, in the present study doctors seemed to be more open during telephone interviews. This also could be due to the fact that telephone interviews lasted on average longer than face-to-face ones. For more details please see Section 6.4.5.3.

6.4.5.3 *RAPPORT*

To establish a good rapport with interviewees, each interview was preceded by an informal chat. As telephone interviews might offer a limited opportunity for establishing a good rapport with interviewees (Opdenakker, 2006), chats prior to the start of the actual interview, on average, lasted longer during telephone than face-to-face interviews. As a result, in contrast to previous studies where telephone interviews were shorter than face-to-face ones (Opdenakker, 2006); in the present study a telephone interview took on average 10 minutes longer.

6.4.5.4 *COSTS*

Face-to-face interviews were significantly more expensive, as all of them were conducted in the Czech Republic and the researcher lives in the United Kingdom.

In terms of the costs of telephone interviews, Skype calls were used to minimise costs. Skype is an online application that enables making either

free or inexpensive Internet calls. However, Skype calls were used without video, on participants' request.

6.5 DATA ANALYSIS

Upon the completion of interviews, digital recordings were transcribed verbatim. The analysis of qualitative data began with an initial framework comprising the Phase II-elicited hypotheses regarding the key barriers to effective shift handover communication between doctors (please see Appendix 6.4 An Initial Data Analysis Framework). Since the present study was explanatory, while analysing the data, the researcher was open to new, previously omitted categories and themes, which could explain how various factors may contribute to ineffective shift handover communication. The Framework approach to qualitative data analysis was chosen as it fits with the critical realism approach. In detail, the Framework approach allows to incorporate new hypotheses (new data) into the thematic framework. Thus, for example, the categories of factors (plausible barriers to effective communication at shift handover), would be the component of the thematic framework. Framework comprises five stages, which are described below (Ritchie J., Spencer L., O'Connor W., 2003).

6.5.1 FAMILIARISATION

The purpose of this stage was to become familiar with the data (Ritchie and Spencer, 1994). Although the researcher conducted interviews and transcribed them verbatim, further reading challenged the researcher's 'initial impressions' of conveyed insights (Ritchie et al., 2003), and therefore enhanced eliciting new insights emerging from the data.

In addition, familiarisation involved reviewing fieldwork notes, to gain further insights into the data and to identify aspects of the interviews' process which

could have affected the interviewees' responses (Ritchie et al., 2003), which formed a new thematic framework.

Afterwards, the transcripts were downloaded into the qualitative data analysis software, NVivo Version 10. Once the transcripts were imported, the researcher used four transcripts, two of junior and two of senior doctors', to elicit the key categories and themes emerging from the data (Spencer et al., 2003). [For greater clarity, in this Phase of the study, less experienced (<15 years) and more (≥ 15 years) experienced doctors are referred to as junior and senior doctors, respectively].

6.5.2 IDENTIFYING A THEMATIC FRAMEWORK

The next stage of analysis involved identifying the key and recurring themes and incorporating them into a thematic framework that was developed in the previous stage and from the earlier hypothesis testing in stages I and II of the study. While the initial version of the framework (hypotheses on barriers to effective shift handover communication between doctors) represented the key perceived barriers to handover identified through the questionnaire survey, the 'new' framework incorporated new categories and themes which have emerged from the interviews, such as heterogeneity of handover forms, doctors various perceptions of the importance of handover, or challenging interpersonal relationships between doctors. This framework was utilised in the next stage of data analysis to index the data (please see Appendix 6.4 An Initial Data Analysis Framework).

6.5.3 INDEXING

The next stage of analysis included applying the thematic framework to make sense of all the data collected during Phase III. Indexing involved reading each transcript and labelling and coding categories and themes. Coding is

defined as 'the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon' (Boyatzis, 1998, p.63).

Assigning the data involved either: (1) identifying correspondences and assigning the data to the main thematic framework, or, (2) establishing new categories and themes. That is, the data were both, theory- and data- driven (Robson, 2011). For example, a new theme 'doctors hold various perceptions of the importance of handover' was enriched by a new category 'some doctors believe handover is unimportant'.

Once all transcripts were indexed, categories and subcategories were assigned to themes and organised around the key barriers to effective shift handover communication between doctors, which established the main findings (explanatory hypotheses on how various factors may coalesce to generate ineffective shift handover communication between doctors). The coding at this stage was descriptive rather than predictive (Lincoln and Guba, 1985). That is, at this stage the researcher did not draw plausible causal links between context, processes and mechanisms, and, ineffective shift handover communication.

6.5.4 PILOT CHARTING AND CHARTING

These stage of data analysis included two phases: pilot charting and charting.

Pilot charting involved applying the main thematic framework to a few transcripts to evaluate whether or not it was sufficiently inclusive of categories and themes emerging from the data. As a result, the initial framework was altered to reflect new emerging categories. For example, new emerging categories, added to the 'doctors hold various perceptions of the importance of handover' theme included: 'handover can be structured or unstructured', 'handover can be informal or formal', 'handover can be shifted

between formal and informal' and 'some doctors perceive handover as an optional practice'.

The actual charting involved summarising verbatim data within the finalised thematic framework. The charts were developed in the following way: one column was assigned to a hypothesis/theme, and a single row to a doctor. In addition, charting allowed identifying miscellaneous categories and subcategories. The chart was enhanced by an additional couple of columns; one column contained information about whether a doctor was junior or senior; the second column was used to document any aspects of the interview process which might have affected the collected insights. Depending on the length of the interview, each thematic chart comprised verbatim transcripts of 3-5 interviewees. Finally, the main thematic chart was developed.

The advantage of charting was that it facilitated drawing a comparison within and between themes (hypotheses) and cases (doctors).

6.5.5 MAPPING AND INTERPRETATION

The next stage of data analysis included interpreting and mapping involved thematic analysis within and across themes and categories. The data within each theme were displayed and classified. When interpreting the data and looking for explanations about how various factors, mechanisms, and structures within themes may collectively contribute to ineffective shift handover communication between doctors, the researcher tried to identify presence and absence of certain themes. For example, some doctors' responses provided an insight into how distrust and mistrust may affect a handover discussion; some discussed how they could manipulate their colleagues during a handover discussion, to convince them to accept responsibility for delivering care to patients on occasions when they

themselves would refuse to do it. It was clear from this and other themes that handover was not always transparent, and that there were sometimes hidden agendas. At this stage, Trust became one of the overarching themes that covered a range of these sub-themes. At this stage the researcher reduced the data, to be able to provide a comprehensive but succinct account of each theme.

Once the data within each theme were classified, the researcher prepared a conceptual framework summarising the key findings from each theme (please see Appendix 6.4 The Final Data Analysis Framework). The attempt was made to demonstrate the range and diversity of the results. In addition, interpreting and mapping involved making comparisons with evidence from previous studies to see if and how the results related to existing evidence.

6.6 THE KEY FINDINGS FROM THEORY-TESTING PHASE III

This section presents interviewees' experiences and perceptions of the importance and the causes of the key barriers to effective shift handover communication between doctors. The section describing the qualitative findings comprises three sub-sections, which represent the areas of hypothesis testing and development, informed by the themes which emerged from the qualitative data, that is: (1) effective communication between doctors at shift handover is hindered by the inadequacies of the medical education and healthcare system (including a disruptive working environment); (2) effective communication between doctors at shift handover is hindered by insufficient clinical and communication skills of doctors; and (3) effective communication between doctors at shift handover is hindered by the social context of handover.

6.6.1 EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE MEDICAL EDUCATION AND HEALTHCARE SYSTEMS, INCLUDING A DISRUPTIVE WORKING ENVIRONMENT

6.6.1.1 STRUCTURED, SEMI-STRUCTURED AND UNSTRUCTURED PRACTICE

Interviews revealed that shift handover is a heterogeneous practice with evident differences in the forms and frequency within and across departments. In some departments handover was fully or semi-structured and the team composition was fixed; however, in the majority of departments it was informal and conducted on an ad hoc basis. Sometimes the handover shifted between formal and informal dependent on the patient's condition:

"In the morning we meet in the director's office and we discuss the most urgent cases...so all doctors know what is going on..."

INFORMANT 11 (SENIOR)

"We have two types of beds in the ICU... we have ten beds there and we go from one bed to another and discuss the real situation, patients' clinical status... For example, this patient had an angiography today, he had this kind of surgery, he needs a CT scan at nine o'clock and so on..."

...This is done with each patient, which means this is a face-to-face communication with these written records in front of us... this means that we have his [patient's] status, we have a record of all his drugs and he [a duty doctor during the previous shift] tells me 'He is good, no problems here' or 'He is taking these medications'..."

...When the next doctor comes he takes the report and at 4 p.m. he goes from one bed to another to check if everything is under control... and he writes a note that he saw patients, that patients are in such condition and whether or not they need any new medications or need to be taken off some medications. This activity takes place twice a day, at seven in the morning and at four in the afternoon. We do conduct this kind of handover to eliminate errors and to guarantee that doctors who start the next shift know what to do... Also, we do it to ensure that all of them (doctors) know everything about patients."

INFORMANT 8 (SENIOR)

"...there are two things... the first thing is the condition, the patient's state...I need to decide if the patient's condition is good or not, and whether it is necessary to do the handover..."

INFORMANT 7 (SENIOR)

"We do not discuss all patients; we discuss unstable ones and those just admitted to the hospital."

INFORMANT 4 (JUNIOR)

AN OPTIONAL PRACTICE

However, while in some departments handover was structured and compulsory, in others it seemed to be optional, that is, a number of interviewees reported that on some occasions handover does not take place:

"If my colleague is running late, or he is in the hospital but in another part of the hospital, I can't wait for him... I need to pick the children up after nursery. In this case we speak over the phone or wait until the next day if there is nothing to talk about... no urgent cases."

INFORMANT 11 (SENIOR)

"...We all meet at 7:30 in the morning and we discuss any problems. We also try to predict what will happen during the next shift. But sometimes a duty doctor who has completed his night shift goes home..."

INFORMANT 6 (SENIOR)

"...if there is something important he leaves a note... he sometimes leaves a request without any justification and there is no justification for the tasks or tests requested...so the doctors who start a morning shift call him..."

INFORMANT 10 (JUNIOR)

"...We have other beds for patients who do not need intensive care... then shift handover is a bit different...there are four doctors in the department, sometimes they meet, sometimes they don't... but nevertheless, before leaving the department the junior doctor comes to the Chief doctor and says, for example, 'everything is ok, I am going home' or, 'I have this problem, what do you suggest I do?' ...but this communication is only between doctors and they do not confirm any information with patients."

INFORMANT 8 (SENIOR)

"There is no afternoon handover so if a patient is unstable, I call a doctor and discuss the case over the phone... but we don't meet in the afternoon... everyone is rushing to go home..."

INFORMANT 14 (JUNIOR)

The above quotes suggest that doctors had the ultimate decision-making authority over how and whether handover was conducted. Furthermore, while the interviewees' responses indicated that their decisions as to whether or not to conduct handover rested primarily on their subjective assessment of a patient's condition, sometimes those decisions appeared to be driven by other personal commitments such as the need to pick up the children from the nursery.

AN INFORMAL PRACTICE

Furthermore, in some departments handover was either or both unstructured and/or informal:

"This exchange of information is largely informal."

INFORMANT 9 (JUNIOR)

"There is no scheduled time for it, sometimes we meet by chance with my colleague and he says to me: 'well, all patients are ok.'"

INFORMANT 4 (SENIOR)

Notably, even where there was a structured handover, some interviewees believed that it should be conducted only for severely ill patients with a risk of deterioration:

"...Sometimes there is no need for shift handover... if all patients are stable... if necessary, we can communicate over the phone..."

INFORMANT 7 (SENIOR)

Both, determining a need for handover according to doctors' subjective assessment and the absence of handover, emerged as barriers to effective shift handover communication as they seemed to 'prevent' doctors from discussing patients' cases, sharing uncertainty, and asking for advice or help.

FORMS OF HANDOVER AND THEIR PERCEIVED EFFECTIVENESS

In terms of the form of handover, the interviewees reported using different methods. This included both verbal and written communication, such as: (i) face-to-face conversations with the aid of records or other sources of information of patient's clinical status, medications, and treatments etc., (ii) telephone conversations, and, (iii) exchange of emails. The majority of interviewees reported, however, that on some occasions shift handover is limited to a brief conversation over the phone:

"...We communicate via telephone, most often...but in neurology they (doctors) meet twice a day."

INFORMANT 12 (JUNIOR)

"We don't meet... if necessary I can call them."

INFORMANT 11 (SENIOR)

In relation to the effectiveness of different forms of handover, a couple of interviewees perceived telephone handover less effective than face-to-face handover, mainly because face-to-face handover seemed to be perceived as a buffer against information gaps:

"...I believe the difference is that I get more detailed information, better quality information during face-to-face handover... listening to my colleagues gives me ideas about what questions I need to ask and what I may want to ask the patient about... I can also figure out what I can expect from him, as there are different sorts of doctors, less and more experienced, more and less responsible, I think the error rate is lower when there is personal contact...but it is not possible in the majority of the cases."

INFORMANT 6 (SENIOR)

Although interviewees preferred to conduct handover face-to-face, a notable theme that emerged from the interviewees' responses was that for some of them being familiar with a handover counterpart seemed to improve the quality of handover over the phone:

"If I know a doctor, I am comfortable with a telephone call..."

INFORMANT 2 (SENIOR)

The interviewees had different perceptions of the usefulness of the phone as the aid of handover communication. However, despite these different perceptions, the interviewees agreed that due to organisational constraints, on some, indeed many, occasions conducting handover over the telephone is necessary. Still, face-to-face handover appeared to be conducted more often than handover conducted over the phone.

The interviewees' responses indicated the other system-related barriers to effective communication at shift handover, these are discussed below:

6.6.1.2 LACK OF DISTRACTION-FREE HANDOVER LOCATION

The interviewees working at the two Sites (1 and 2) acknowledged that shift handover can be negatively influenced by its context and identified a number of organisational barriers to the process. This section briefly examines the impact of these organisational factors on handover.

Lack of a quiet location to conduct handover, interruptions and high noise levels were the key environment related barriers to conducting an effective handover:

"A doctor staffroom is located near a nurse staffroom. There are more nurses than doctors and they won't stop talking... if we need to think things through...well, with all that noise, you cannot concentrate... there is too much noise to concentrate... There is a quiet staff room but it is located on another floor and we lose time, approximately 10-15 minutes to get there, and this is a lot of time for us..."

INFORMANT 3 (SENIOR)

6.6.1.3 LACK OF TIME, TRAINING AND LIMITED FINANCIAL RESOURCES

LACK OF TIME

Furthermore, as it was previously mentioned, some interviewees believed that lack of time impedes their ability to conduct handover effectively:

"Sometimes...there are instances where you cannot do this [handover] ...you do not have enough time to do it."

INFORMANT 11 (SENIOR)

"...there may be an issue with time"

INFORMANT 10 (JUNIOR)

"Lack of time is the biggest barrier..."

INFORMANT 14 (JUNIOR)

However, by contrast, two interviewees did not perceive lack of time as barrier to conducting an effective handover, rather the attitude of their colleagues towards work:

"For me personally time is not an issue...I would say that our workload is not too bad. It's more written in newspapers than in reality. I am a bit angry with the EU and all these working hours regulations. This socialistic EU will be the end of order in Europe. We should not think about it, about the time schedule from eight to five, it's nonsense...but in reality...I know a lot of colleagues who are not even fulfilling their whole working time and just try to escape (go home) as soon as possible. I think this is the very reason why they do not want to spend much time handing over. Just say: 'well all the patients are ok, take care, I am going home'. This is the case."

INFORMANT 12 (JUNIOR)

"This is about the philosophy and the way you understand medicine, the time is not an excuse."

INFORMANT 13 (SENIOR)

Interviewees' responses provided interesting insights into barriers to handover arising from time available and handover location. Furthermore, three doctors believed that there should not be any designated time for conducting handover. To illustrate their point they alluded to nursing handover. Those interviewees felt that it is inappropriate that nurses spend daily a fixed amount of time on handover:

"There is a dark side of having an uninterrupted time for handover (like nurses do), you are not taking care for the patient for the period of time."

INFORMANT 3 (SENIOR)

The other system- related barriers to shift handover communication which emerged from the interviews were lack of training and limited financial resources:

LACK OF TRAINING

The main system-related barrier to handover was lack of training in how to conduct handover:

"...it needs to be taught, how to communicate to a colleague..."

INFORMANT 5 (SENIOR)

"We are not trained for this handover communication, we also have no specific training in how to communicate with the patients, or there is not enough of that. And that's much more important that communication with doctors... but even communication between doctors, it is hard to learn..."

INFORMANT 14 (JUNIOR)

"I believe there is not enough training".

INFORMANT 7 (JUNIOR)

"During the medical studies and during residences, there is no training for it."

INFORMANT 10 (JUNIOR)

"We receive no training in how to communicate with other colleagues. Nurses do but we don't. We don't receive enough training on how to communicate with patients."

INFORMANT 12 (JUNIOR)

LIMITED FINANCIAL RESOURCES

Another system-related barrier to handover, which could have an impact on doctors' ability to conduct shift handover, was lack of financial resources:

"No money, our hospital is accredited and they still want to reduce beds. At the same time, those who work for insurance companies drive expensive cars. The amount we are going to receive this year is less than we were promised as they have to make cuts to healthcare expenditures."

INFORMANT 5 (SENIOR)

Limited financial resources, resulting in reduced working hours, appeared indirectly, to have negatively affected the quality of handover communication:

"...in the current political situation, unwillingness to pay for our time, reducing working hours, all of this has a huge impact on doctors, they become nervous, and this has an impact on how they behave towards each other and patients."

INFORMANT 14 (JUNIOR)

"...we have not got enough beds, patients come to the hospital, spend there a couple of days and need to be sent home, sometimes they are quite unwell..."

INFORMANT 10 (JUNIOR)

"...and in some hospitals the situation is completely different, this is really frustrating. In some hospitals they are so busy, they have

no beds available, as they have not been paid...and the attitude of those people from the Ministry of Health...it is so poor, it is just impossible to communicate with them... all of this has an impact on communication, not only between doctors but also between different healthcare professionals, I am telling you, this is terrible and it is not going to improve anytime soon..."

INFORMANT 12 (JUNIOR)

Furthermore, the interviewees' responses indicated that not only the attitudes of those working at the Ministry of Health presented a serious problem for handover communication, but that also doctors' perceptions of the importance of handover posed a problem; we shall discuss it in the next section.

6.6.1.4 DOCTORS' PERCEPTIONS OF THE IMPORTANCE OF SHIFT HANDOVER AND POTENTIAL ROLE(S) OF HANDOVER

THE IMPORTANCE OF HANDOVER

While some doctors perceived handover as the pillar of the delivery of high quality patient care, others believed handover has no value:

"Do you know what the continuity of care and the continuity of quality care of the patient is? ...if I say, 'yes, this is right, it's the continuity of quality care of the patient but in fact it means that you know... I can get it (information) from the one who previously cared and managed the patient...this is not a proclamation, this is not a sentence, this is the fact... this is the foundation of the continuity of quality patient care."

INFORMANT 7 (SENIOR)

"I don't think this is important..."

INFORMANT 8 (SENIOR)

"Sometimes communication is necessary just to get to know the case: 'yes I have new information about this patient...'"

INFORMANT 4 (SENIOR)

These differences in doctors' perceptions of the importance of handover seemed to reflect the fact that in the majority of departments at which interviewees worked; handover was disparate and unstandardized, probably due to the absence of training in how to conduct handover or guidelines:

"...we don't have any policies on handover practices..."

INFORMANT 8 (SENIOR)

Furthermore, the results suggested that handover is not only affected by the absence of guidelines, but also by the social context in which it takes place. The qualitative results have revealed that shift handover is, to a significant extent, informal and affected by social relationships between doctors. This was evidenced by the interviewees' responses, which suggested that junior doctors might be required to carry out different handover procedures from senior doctors. In detail, the results indicated that doctors decide whether or not to prepare for handover. Notably, only more experienced doctors had a choice as to whether to prepare for shift handover, as it was compulsory for junior doctors to do so, at least in departments where handover was standardised:

"Young colleagues are asked to make notes before handover, so they remember what to say..."

INFORMANT 2 (SENIOR)

"During the morning shift handover a doctor actually takes some notes to remind him or her to check what the patient is like, to check it in the afternoon and again in the morning."

INFORMANT 14 (JUNIOR)

"Patient information is available electronically. I print these records before we exchange information, highlight important information in red and I use it during the handover to remind me of important data... but the majority of senior doctors do not print records or any test results, they write notes after the meeting."

INFORMANT 12 (JUNIOR)

The results of Phase III have also shown that some doctors may conduct handover verbally without referring to any records, as they believe that sometimes the latter was unnecessary:

"This information is conveyed verbally. I do not use any documents. All documents are available in hard and electronic forms ..."

INFORMANT 14 (JUNIOR)

POTENTIAL ROLE(S) OF HANDOVER

In addition to facilitating sharing information related to the delivery of patient care, dealing with uncertainty and informal learning were identified by the interviewees as the potential role(s) of handover.

DEALING WITH UNCERTAINTY

The interviewees reported that handover should include information that enhances their ability to deal with uncertainty, including contingency plans. These traits of handover represented enablers rather than barriers to shift handover communication. An absence of such enablers can be perceived as barriers:

"...sometimes during handover we don't get any new information, any information that we did not know before handover. However, sometimes you can see some links, connections you could not make earlier, thanks to insightful comments made by colleagues..."

INFORMANT 8 (SENIOR)

"...If something happens to the patient... for example, he suddenly deteriorates, I can check it immediately and I can treat it...so I need to know what are the likely complications of this case, and what would be the adequate course of treatment ...some plans."

INFORMANT 6 (SENIOR)

"...Well, first I need to decide and inform them concerning what they should know about a patient. Whether the patient is at risk of some deterioration, if there is a high chance of acute treatment, and so on..."

INFORMANT 7 (SENIOR)

"...when you communicate with your colleagues they give you a second opinion on the patient's status and the course of treatment."

INFORMANT 11 (SENIOR)

This act of sharing information, especially when diagnosis is difficult, allow doctors to share responsibility for delivering patient care:

"...the main purpose of the handover should be a mutual or group decision-making about the course of medical treatment."

INFORMANT 4 (SENIOR)

INFORMAL EDUCATION

An additional function of shift handover that emerged in interviews was continuous education and training. The interviewees specified that while

both, less and more experienced doctors may learn from feedback received from their colleagues during handover. In terms of their own development, the more experienced doctors believed that shift handover should provide them with an opportunity to verify an initial diagnosis they made:

"...during week days our director (clinical) is involved in handover so we can ask him questions... you can discuss treatment options and agree what to do... I think it helps as other doctors may be able to help you explain the patient's clinical status..."

INFORMANT 5 (SENIOR)

The more experienced interviewees believed that being unable to confirm diagnosis was a barrier to conducting handover effectively.

There were differences between the senior interviewees in how they perceived the use of handover for educating less experienced doctors. While some used handover as an opportunity for teaching, others prefer to exclude this aspect of handover:

"I am teaching other colleagues. I am explaining to him what the specific risks of the specific patients are. This is the teaching part of handover."

INFORMANT 8 (SENIOR)

"I say to young doctors: 'try to check this...be careful...try to find out more information about this case...'"

INFORMANT 2 (SENIOR)

"If a junior doctor is signing over to me I should respect that and probably spend more time with him and with the patient, ask him specific questions."

INFORMANT 7 (SENIOR)

"The only difference is that the older doctors can give you a piece of advice and the younger doctors may ask more questions than the older ones..."

INFORMANT 6 (SENIOR)

The interviewees' responses also indicated that learning from senior colleagues positively affected junior doctors' confidence in their ability to make independent clinical decisions. This independence appeared to be necessary for less experienced doctors to communicate effectively at shift handover. This seems to be especially the case when handovers involved "difficult seniors". Therefore, lack of feedback and teaching during handover emerged as a barrier to effective communication.

6.6.1.5 DOCTORS' JUDGEMENT OF THEIR COLLEAGUES' ABILITIES AND SKILLS TO CARRY OUT HANDOVER AND OF THEIR TRUSTWORTHINESS

With regard to the more experienced doctors, their decision as to whether or not to prepare for and participate in handover seemed to be based on their judgement of a colleague's ability (e.g. whether they are capable of making an accurate diagnosis). This in turn relates to the fact that the more experienced doctors seem to have more authority over whether or not handover takes place at all.

That is, doctors reported making decisions regarding whether to actively participate in handover, for example through asking additional questions. This decision emerged in interviews as being based on doctors' judgement of their colleagues' abilities and skills to carry out handover:

"I know how experienced my colleague is in handing over the patient's case, so that's another way of understanding this handover process".

INFORMANT 4 (SENIOR)

"...I need to recognise if a doctor is dull..."

INFORMANT 8 (SENIOR)

"...sometimes when I hear what they say I want to take patients away from them..."

INFORMANT 4 (SENIOR)

The judgement of a colleague's ability seemed to be affected by familiarity with handover counterparts:

"...It is probably the most important [thing, that is,] with whom I will speak... If I know the colleague, I have direct contact with the doctor, I know exactly the guy or the lady and I know whether I can rely on the data [information] he gives me. Or I know whether I should ask specific questions."

INFORMANT 7 (SENIOR)

The interviewees' responses also suggested that familiarity with handover counterparts was used by doctors to set expectations regarding the course of handover, for example to estimate the likelihood of information omissions:

"If I speak with someone I don't know well, I think information omissions are pretty frequent, something like 20% of cases. ...the CT which I interpret myself of course, but the basic neurologic examination and basic data should be provided immediately without me having to ask for it, and probably, I expect it to happen, but then when I start caring for this patient I notice he didn't mention something about coagulation or the patient's comorbidities...and sometimes those comorbidities are very important...for example, if the patient has got an unstable angina pectoris, I should get this information...I should not be asking if the patient has problems with the heart, with the lungs, with the kidney or with some other organs... I should immediately get information

about all relevant comorbidities, and this quite often does not happen..."

INFORMANT 7 (SENIOR)

"Sometimes I do look at all the information and there may be different reasons for that. Maybe one of the reasons is that other colleagues do not understand what data I need to know..."

INFORMANT 8 (SENIOR)

If senior doctors perceived their handover counterparts' as incompetent, they tended to withdraw from discussion, considering any attempts to elicit essential information as futile. That is, some interviewees reported withdrawing from handover when they felt a discussion was unsatisfactory, rather than trying to obtain more information from their colleagues:

"...probably my mistake is that I do not ask specific neurosurgical questions."

INFORMANT 7 (SENIOR)

The interviewees also believed that if the handover is done by doctors with expertise in different areas, which reportedly happened when patient care was delivered jointly by doctors from different departments, the likelihood of misunderstandings increases:

"Difficulty in recognising which information is important for patient care. - this happens on interna [Internal Medicine] and neurology, not the chirurgic department or anaesthesia."

INFORMANT 8 (SENIOR)

"I think... we can say that... there are differences between surgeons and internal medicine doctors" [laugh]

INFORMANT 7 (SENIOR)

6.6.2 EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY INSUFFICIENT CLINICAL AND COMMUNICATION SKILLS OF DOCTORS

Communicating patient information

6.6.2.1 ELICITING ESSENTIAL INFORMATION FOR THE PROVISION OF A PATIENT'S CARE: PRIORITISING HANDOVER CONTENT

The ability to elicit essential information during handover was identified by the interviewees as essential and they understood the role(s) of handover as the process that facilitates *"an exchange of information"*. This role, as described by the interviewees, focused on handover content (what information is given during handover), and, on how this content is summarized and communicated.

The senior interviewees believed that information conveyed during handover should be prioritised to enable handover counterparts establish a shared mental model (understanding) of both the patient's clinical condition and a treatment plan. The interviewees defined prioritisation as being selective, eliciting and compressing the key information into a 'succinct story', and communicating it concisely during handover.

SPECIFIC CONTENT – ESSENTIAL INFORMATION; PRIORITISING INFORMATION TO BE INCLUDED IN HANDOVER

A notable theme that emerged from interviews was that the interviewees had specific expectations of what information should be given during handover; these expectations included information related to the following areas of health care delivery:

(i) Clinical: All of the interviewees agreed that handover should include information about a patient's clinical status:

"...well, I should learn about the clinical state of the patient..."

INFORMANT 10 (JUNIOR)

"I should be well informed which patient is unstable..."

INFORMANT 12 (JUNIOR)

(ii) Managerial: Some senior interviewees raised the importance of discussing both short- and long-term treatment plans:

"Senior doctors select which information to give during handover. They provide a treatment plan..."

INFORMANT 2 (SENIOR)

"When we change shifts we communicate about what may or will happen during the next shift, what we need to do during the next shift."

INFORMANT 7 (SENIOR)

"...it is good to receive information on your arrival... you are clear about how to prioritise your tasks..."

INFORMANT 10 (JUNIOR)

"...it is important to know the course of the patient's treatment from the beginning and also to guide the treatment to the very end..."

Informant 2 (Senior)

"I want to get information that guides the treatment."

INFORMANT 12 (JUNIOR)

"In an ICU I should know more about the patients, including the results of blood and other tests. As for the standard ward, I should be informed about the patient who underwent surgery on the day and also whether there is, for example a patient who is suffering from severe pain so I can provide appropriate measures for pain relief. Whether I should focus on urination... Whether I should check the patient with cerebral disc surgery... There may be oedema or some bleeding in the wound which may deteriorate the patient's breathing, so I should be informed whether I should check the wound."

INFORMANT 4 (SENIOR)

Notably, there was an overwhelming agreement amongst the senior doctors that junior doctors did not provide a treatment plan, which they believed to be a significant barrier to handover communication. Not providing information about a treatment plan during handover was associated with communicating information in an unstructured way, hence failure to prioritise essential information. The nature of prioritising patient information and how lack of prioritisation may negatively impact the effectiveness of shift handover is discussed in the next section.

PRIORITISING ESSENTIAL INFORMATION

The interviewees also discussed how the key information should be conveyed during handover:

"Well, fast, efficient, I get all information I need, I get information about which patients I should focus on... I need only basic and important data."

INFORMANT 7 (SENIOR)

"When you hand over information to another colleague, you need to reduce it to a few essential points, and the understanding of these essential points need to be correct, there essential points need to be communicated in the right way, so your colleague can understand them... so he knows what to do with the patient, what he needs to do during his shift..."

INFORMANT 8 (SENIOR)

"The results need to be given in the right order, this is very important for understanding the patient's case...what are the causes of illness and what the potential consequences of different treatments might be..."

INFORMANT 6 (SENIOR)

"I need a clear summary of a patient's history, and in majority of the cases you need only five, six, sometimes seven lines of information about the patient..."

INFORMANT 5 (SENIOR)

"I need to adjust information so it can be understood... and make a resolution to the case, tell them how the patient should be treated..."

INFORMANT 11 (SENIOR)

There were apparent differences between junior and senior interviewees' opinions regarding what information should be provided during shift handover. While senior doctors seemed to focus on prioritising information and on providing a succinct summary of a patient's case; junior doctors discussed conveying as comprehensive picture of a patient's condition as possible, including test results, if they were available. This may explain why senior interviewees reported that handover conveyed by junior doctors includes a lot of redundant information:

"I think there is no need, to give the whole history and all the history of the lab testing, before and after this surgery, so it is important to give the most important information..."

INFORMANT 2 (SENIOR)

The below response suggests why junior doctors might provide redundant information during shift handover:

"...sometimes junior doctors report a large amount of information not to miss anything..."

INFORMANT 8 (SENIOR)

On the other hand, the senior interviewees (senior doctors) also felt that junior doctors tend to omit essential information:

"They do not tell us the key info..."

INFORMANT 3 (SENIOR)

"...sometimes they omit the key information... they aren't skilled...or they may focus on something else... they are not so experienced..."

INFORMANT 11 (SENIOR)

The senior interviewees felt that junior doctors are less effective than them in communicating handover content and attributed some junior doctors' inability to convey handover effectively to lack of skills and experience:

"...incompetence and misunderstandings are the causes of this..."

INFORMANT 7 (SENIOR)

"...you need to be experienced to be able to do it, to say what needs to be done during the next shift..."

INFORMANT 2 (SENIOR)

To make matters worse, some senior doctors felt that some junior doctors are unwilling to make the effort to learn new things:

"...sometimes I try to communicate with junior doctors... but often I end up talking to senior doctors. The young doctors are acting like I know-it-all and there is no need to study anymore..."

INFORMANT 8 (SENIOR)

Lack of experience of junior doctors combined with their perceived unwillingness to learn new things was viewed by senior doctors as a significant barrier to conducting handover effectively. However, it also emerged in interviews that there are no guidelines for doctors on what information to include in the handover and this may explain why junior doctors might struggle to elicit essential information for the provision of a patient's care:

"...we don't have any checklists ...I ask specific questions, for specific conditions, there are specific questions that need to be answered, for example, patients with traumatic brain injury, we always need to find out: what is his clinical status, what is the status of his consciousness, if he has some focal deficit etc., what is his blood count and coagulation status, especially platelets, if the blood can coagulate...all of these questions need to be answered..."

INFORMANT 11 (SENIOR)

Furthermore, difficulties in reaching, and on some occasions failure to reach, mutual understanding were further barriers to handover raised by the interviewees. That is, on some occasions, doctors' (handover counterparts)

assessments of a patient's condition varied. In such instances doctors were likely to consider different information as the most important for the provision of care. If doctors considered different information as the most important, they were unlikely to achieve a common understanding of a patient's condition and were unlikely to satisfy each other's information needs. In such instances handover counterparts could consider essential information to be missing from a handover discussion:

"...there may be some discrepancies in understanding what is, at the moment, the most important...there may be some misperceptions and that is the reason why we should try to communicate as much as possible..."

INFORMANT 5 (SENIOR)

Overall, with regards to communicating essential information, the researcher got the impression that as well as specific details communicated during handover, there is a need for an agreed overview of what is important at that time. Also, that it was usual for different doctors to have different ideas of what matters and, therefore, to disagree about which specific details are important in a handover:

"...evaluation of symptoms, the same symptoms may be evaluated differently by different doctors; this is the origin of barriers..."

INFORMANT 11 (SENIOR)

In addition, if doctors participating in handover had different perceptions regarding which information is essential for the delivery of a patient's care, they were unlikely to complete records in a way which would satisfy their handover counterparts' information needs. However, some doctors felt confident about their ability to elicit essential information given during a handover discussion:

"I think recognising essential information isn't difficult. I realise all the essentials after the first several sentences I hear from my colleague...I ask some additional questions ... because what is essential for me might not be essential for him...sometimes it differs... ..he may not realise what is essential for me... .. I can ask him additional questions to get additional data...as he may not realise what is essential for me..."

INFORMANT 8 (SENIOR)

6.6.3 EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE SOCIAL CONTEXT OF HANDOVER

6.6.3.1 TRUST AND RELIABILITY VERSUS GETTING WHAT YOU WANT BY PRIORITISATION-MANIPULATION:

The interviewees also revealed that prioritisation may be used in a negative way, to convince colleagues to accept responsibility for delivering care to patients on some occasions, where they could refuse to do it (this seemed to be the case during shift and other forms of handover):

"Sometimes I say different things to different colleagues..."

INFORMANT 14 (JUNIOR)

"Barriers can be linked to medical problems or they can be linked to our system. For example, if there are no beds available in our department we may keep the patient in the neurology department... the patient is admitted by our colleagues but then we treat him together... sometimes they are scared to admit a patient (doctors from other departments) and then, of course, information may need to be adjusted to prevent them from saying: 'I don't want him (the patient) here as I am taking the risk, I don't know what to do with him... so information is adjusted.'"

INFORMANT 13 (SENIOR)

Notably, some interviewees felt that manipulating handover content is “acceptable” if it is done in the patient's best interest. On the other hand, three respondents discussed the negative impact of providing and documenting inaccurate information during handover:

“...the colleague will tell us one thing and record something else...”

INFORMANT 2 (SENIOR)

One informant believed that doctors might report inaccurate information to hide errors and mistakes.

“I would say between two to five percent [is false], I am trying to be optimistic. This may be on purpose, that I do not get all the data.”

INFORMANT 11 (SENIOR)

Information omissions were considered by some interviewees to have negative effects beyond the handover process itself; these included, for example, the reassessment of a patient's medical condition, and thus, unnecessarily wasted time and financial resources. Overall, two factors seemed to determine doctors' perceptions of the reliability of information received during handover: (a) doctor's perceptions of handover counterparts' clinical ability; (b) doctors' perceptions of whether they could trust their colleagues, their judgement of this sometimes included attempts to identify any potential hidden agendas.

Other obstacles to handover associated with communicating patient information were messy, illegible records and unavailable information. These are discussed in the next section (6.5.3.2).

6.6.3.2 RECORD KEEPING

In addition to conveying the key information during handover the interviewees reported using *"patient clinical records"*, that is, 'formal' clerking sheets and notes as useful communication aids. The interviewees working at the two hospitals (research sites) reported using various forms of handover communication aids. The interviewees working in Site 1 reported using paper records, whereas the interviewees working in Site 2 reporting using electronic, paper records and whiteboards:

"There are three sources of information, electronic records, documents and the white board."

INFORMANT 9 (JUNIOR)

A notable theme that emerged in interviews was that the majority of interviewees felt overwhelmed by the amount of documents they were required to complete and believed that completing records takes their attention away from their "real job", treating patients:

"This should not be our job, really... nurses should complete records"

INFORMANT 8 (SENIOR)

"Bureaucracy is ridiculous, I am telling you... unacceptable, you have no time for patients but you need to find time to complete records... this is a nightmare..."

INFORMANT 1 (JUNIOR)

"We seem to be administrators these days, not doctors; we have no time for patients... We have too many records to complete..."

INFORMANT 10 (JUNIOR)

"...if we don't complete reports, we will be blamed for all the mistakes that happen... so we take the time to complete forms... and we have less time for patients... a real plague of documents..."

INFORMANT 5 (SENIOR)

"We need to fill in so many forms, sometimes we have no time for patients... this really takes us away from patients..."

INFORMANT 3 (JUNIOR)

Furthermore, the interviewees identified some other barriers related to both electronic and paper records. We shall discuss them in turn:

ELECTRONIC RECORDS

In terms of electronic records, the interviewees held different perceptions of their usefulness and reported that electronic records solved some problems but led to others. Despite the ever increasing use of technology to enhance the quality of handovers, many of the more experienced interviewees described how electronic records were misused, resulting in records including a lot of redundant information and hence being too long, messy and unhelpful:

"Messy reports...well that may be a problem..., on the one hand technology, the computer, has helped with this a lot...on the other hand, if you do not use computers with common sense, you may get never ending reports, with all the data, with all unimportant information. And when I get a five-page report, I am not able to read it."

INFORMANT 7 (SENIOR)

"Everything is copied with no effort to make the report understandable or readable, that's the problem. I think of all of the

departments. I think something like eighty per cent of records are not well written."

INFORMANT 5 (SENIOR)

"Quite often there is [on records] a lot of information which is irrelevant, I sometimes receive a four-page report and the essential information is written down on half of a page..."

INFORMANT 2 (SENIOR)

"...it is better to give a brief account rather than a 'ballast'"

INFORMANT 8 (SENIOR)

That is, messiness of records and unavailability of relevant information was associated by the interviewees with unavailability of test results at the time of handover, and, with relevant information being 'lost' amid non-essential information.

PAPER RECORDS

Regarding paper records, the interviewees agreed that paper records are often untidy and illegible:

"...some colleagues tend to cross information out and write something new, which makes records illegible..."

INFORMANT 9 (JUNIOR)

"Sometimes notes are illegible, doctors are rushing... you can't read their handwriting."

INFORMANT 10 (JUNIOR)

In relation to both electronic and paper records, the interviewees reported having to face several problems: failure of some doctors to complete them, to complete them adequately, and, to keep them up to date:

"some doctors never complete records..."

INFORMANT 4 (JUNIOR).

The potential reasons why doctors do not always complete records included:

- a) Fear of legal consequences, which seemed to be associated with fear of revealing truth (e.g. adverse event) or uncertainty.
- b) Not perceiving completing records as their job.
- c) Lack of time.
- d) Information unavailability.

Fear of litigation was one reason for not completing records:

"Some cases are very difficult... and there may be many causes of illness... and these records need to be written for different audiences... I am responsible for the information I provide...sometimes it is better to wait."

INFORMANT 2 (SENIOR)

A few interviewees discussed interpersonal relationships as barriers to completing records:

"We do not use the forms. It is better to keep some information to ourselves, especially if we are not sure what to do...some doctors are nice, but some are only waiting for you to make a mistake so they can make a fuss about it..."

INFORMANT 7 (SENIOR)

A further barrier to completing records and therefore conducting an effective handover was doctors' perception that making notes was not their job:

"This is not the doctors' job, nurses write important data."

INFORMANT 11 (SENIOR)

Information omissions: Some of the senior interviewees discussed misunderstanding and mistakes as causes of essential information being unavailable:

"...Sometimes information may be lost or misinterpreted..."

INFORMANT 7 (SENIOR)

"...missing or not knowing something important. I have made mistakes; I've misdiagnosed health conditions. Sometimes I think that the patient is stable and I tell my colleague: 'well, this should be an easy case' And then... there might be some complications which could have been anticipated..."

INFORMANT 7 (SENIOR)

Some other interviewees believed that doctors may forget to convey important data when they do not have enough time and when test results they need to make diagnosis is unavailable:

"Sometimes doctors do not raise important things...for example, which patients are at risk of deterioration... or sometimes they tell you about it too late... I think they do this because we are very busy and have not got time for everything we need to do..."

INFORMANT 10 (SENIOR)

"Sometimes doctors can only make an initial diagnosis...because at the time of handover they are waiting for test results...then cannot make a diagnosis until the test results arrive..."

The interviewees also discussed unintended consequences of information omission:

"If information is missing then the quality of care is unlikely to be good..."

INFORMANT 7 (SENIOR)

'If this [handover] is not done, the incoming doctor, the one who stays here over night... the patient was OK during the day and there was no danger during the duty... however, this patient has a seizure at ten o'clock PM and he has a CT. The CT is practically normal but it shows a small brain oedema, which can be caused by some medications given to the patient during the day. If this information is not given to the incoming doctor, then the patient may receive the same medications which caused the seizure again, but this time adverse events will be more severe.'

INFORMANT 5 (SENIOR)

"the most important issue is the clinical status of the patient, if I do not give all the relevant information, it may postpone some investigations and treatments for too long, that's the most important aspect of shift handover"

INFORMANT 14 (JUNIOR)

Overwhelmingly, the interview data indicate that sharing information during handover, particularly completing patient and handover records may be inadequately fulfilled during shift handover.

Other important barriers to effective shift handover communication which have emerged from the results of the present study were doctors' personalities and attitudes.

6.6.3.3 DOCTORS' PERSONALITIES AND ATTITUDES

Interviews revealed that shift handover is strongly influenced by interpersonal relationships between doctors and that personal relationships are in turn affected by some doctors' work ethics, a couple of interviewees illustrated this point saying:

"It depends on doctors' character, this is similar everywhere, with some doctors communication is great, with others you can't discuss patients, it is not on."

"Some doctors just do not listen; they are not interested in what others have to say."

INFORMANT 1 (JUNIOR)

"Also, some doctors, those who only think about the money, they aren't nice. They have no time for patients, they rush them through... They want to see as many patients as possible."

INFORMANT 12 (JUNIOR)

"I would like to discuss it with him, pros and cons, but it is not always possible..."

INFORMANT 14 (JUNIOR)

"We have a few unfriendly doctors and it isn't easy to communicate with them."

INFORMANT 10 (JUNIOR)

Unsatisfactory work relationships emerged in interviews as having a strong, negative impact on both effectiveness of handover and quality of health care:

“...it is difficult to explain to some doctors what his/her responsibilities are...what is his job description and what his responsibilities should be... some older doctors tend to give too much work to the younger doctors, young doctors should not be left unattended as this sometimes leads to adverse events...”

INFORMANT 2 (SENIOR)

6.6.3.4 JUNIOR VS. SENIOR DOCTORS: CHALLENGING INTERPERSONAL RELATIONSHIPS BETWEEN DOCTORS

Interpersonal working relationships seemed to have the strongest impact on handover involving junior and senior doctors. Interviews revealed striking differences between the more experienced doctors' perceptions of the behaviour of junior doctors. While some senior interviewees believed that junior doctors are “arrogant”, “rude”, “overconfident”, others reported that junior doctors lack courage to speak in the presence of their senior colleagues. One doctor remarked:

“If they [junior doctors] spoke up when their supervisor is involved in discussion, we would preclude numerous errors...”

INFORMANT 3 (SENIOR)

“Junior doctors can't make the effort to be friendly...”

INFORMANT 11 (SENIOR)

One senior informant believed that being senior puts you in a “*better position*”, not only because it allows doctors expressing their opinions, but also because it makes their voices heard:

“...if senior doctors raise some issues you always take them into account.”

INFORMANT 10 (JUNIOR)

Some of the senior interviewees discussed the pressure on junior doctors to perform well, without receiving adequate support:

“Some older doctors do not help younger ones... they observe how they struggle...”

INFORMANT 11 (SENIOR)

Furthermore, a number of interviewees believed that lack of support ‘forces’ junior doctors to hide uncertainty and admit mistakes to seniors:

“Junior doctors are afraid to admit they had made a mistake.”

INFORMANT 7 (SENIOR)

“They are afraid to ask for advice if they do not know what to do with the patient... they just do their own thing as they are afraid to ask questions... they are afraid to be humiliated... I know it happens in other departments. The head of our department is very easily approachable...”

INFORMANT 8 (SENIOR)

“Senior doctors discuss uncertainty openly... junior doctors try to hide from us that they do not know what to do...”

INFORMANT 2 (SENIOR)

Another negative consequence of junior doctors being afraid to challenge their senior that emerged from the data was unclear division of responsibilities, particularly on occasions when handover involved junior and senior doctors. Some senior doctors believed that some of their senior colleagues use shift handover to delegate their work to junior doctors, which seemed to create tensions and resentment amongst junior doctors. Interestingly, this theme did not emerge in interviews with less experienced doctors.

6.7 A SUMMARY OF THE THEORY-TESTING PHASE III

This third phase of theory-testing provided interesting insights into the causes of ineffective shift handover communication between doctors. The key findings from Phase III are outlined below, however, a new theoretical position, hypotheses, on how various factors and mechanisms may collectively contribute to ineffective communication between doctors at shift handover are presented in a discussion chapter (Chapter 7).

EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE HEALTHCARE AND MEDICAL EDUCATION SYSTEM (INCLUDING INADEQUATE WORK ENVIRONMENT)

The interviewees' responses indicated that handover between doctors in the Czech Republic utilised a variety of forms. Shift handover, as reported by the interviewees, could be structured, semi-structured or unstructured, formal or informal. While there was no precise indication of the frequency with which different forms of handover were employed, ad-hoc and informal forms seemed to be most frequent. In addition, on some occasions handover could not take place. Furthermore, the interviewees' experiences and perceptions of the importance of shift handover varied greatly, which seemed to have a negative impact on the process. These differences in handover's forms and

conduct and in doctors' experiences and perceptions of handover seemed to arise from the absence of training and guidelines on how doctors should communicate during handover.

As for handover records, there seemed to be a number of obstacles which could 'prevent' doctors from completing records, these included: barriers arising from the system - fear of documenting uncertainty; barriers arising from doctors' professional identities - perceiving completing records as not their 'real' job.

With regards to the work environment, interviewees believed that their ability to communicate effectively during handover was impeded by lack of time, poor workforce planning, busy periods in the department, lack of designated place for handover, and interruptions. In addition, lack of money and staff shortages (resulting in high workload) seemed to negatively influence handover communication.

EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY INSUFFICIENT CLINICAL AND COMMUNICATION SKILLS OF DOCTORS

In addition, inadequacies related to transferring information at handover also seemed to be associated with doctors' clinical abilities. Lack of experience seemed to be the most significant obstacle to shift handover communication. For example, some senior interviewees reported that junior doctors' handover records include a lot of redundant information and lack coherence.

EFFECTIVE COMMUNICATION BETWEEN DOCTORS IS HINDERED BY THE SOCIAL CONTEXT OF HANDOVER

Since handover seems to be, to a significant extent, an informal and social process, the quality of social and work relationships between doctors are the

determinant of the effectiveness of handover communication. Indeed, the results of the present study suggest that poor working relationships impede effective communication at handover. The interviewee's responses revealed that social relationships between doctors were a source of tensions and presented barriers to effective shift handover communication. The most notable themes, which emerged from interviews in relation to the social context, were distrust and fear, sometimes linked to fear of legal litigations (e.g. that a colleague/handover counterpart can reveal confidential information).

In addition, working relationships between junior and senior doctors seemed to have a particularly negative impact on handover. Some senior interviewees' suggested that senior doctors might use a handover discussion to unevenly divide workload, for example, to delegate some of their own responsibilities to junior colleagues. On the other hand, some senior interviewees perceived junior doctors as rude and unwilling to learn new things.

The hypotheses taken forward as plausible from Phase III are presented on the next page.

HYPOTHESES TAKEN FORWARD AS PLAUSIBLE FROM THEORY-TESTING PHASE III

(1) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE HEALTHCARE AND MEDICAL EDUCATION SYSTEM, INCLUDING A DISRUPTIVE WORKING ENVIRONMENT

The absence of training in how to conduct handover.

The heterogeneity of handover forms is a barrier and that handover is an informal practice.

Doctors' varied perceptions of the importance of handover, including some doctors' perceptions that handover is not important.

The optionality of whether handover takes place or not, left to doctors' discretion.

No handover.

Fear of legal consequences, which seemed to be associated with fear of revealing truth (e.g. adverse event) or uncertainty.

Preparing excessively comprehensive records.

Information unavailability.

Lack of teaching less experienced doctors during handover.

Limited financial resources.

Lack of time.

Lack of a distraction-free handover location.

(2) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY INSUFFICIENT CLINICAL AND COMMUNICATION SKILLS OF DOCTORS

Lack of capabilities and skills to elicit essential information for the delivery of a patient's care.

Lack of prioritisation of essential information to be conveyed to doctors who start their shift at handover.

Preparing excessively comprehensive records.

(3) EFFECTIVE COMMUNICATION BETWEEN DOCTORS IS HINDERED BY THE SOCIAL CONTEXT OF HANDOVER

Professional identities, some doctors' personalities and attitudes towards work, resulting in: challenging interpersonal relationships between doctors.

Providing inaccurate information at handover, consciously or unconsciously.

Various hypotheses taken forward as plausible from Phase III, are scrutinised in the next chapter, to propose a new theoretical position, causal hypotheses about how various factors, mechanisms and structures may collectively contribute to ineffective shift handover communication between doctors.

CHAPTER 7 DISCUSSION OF THE KEY FINDINGS

7.1 INTRODUCTION

Chapter 1 showed that the current hospital environment in the Czech Republic presents challenging conditions in which conducting handover might be compromised. Despite these conditions, there has been no published evaluation of handover practices in the Czech Republic, nor has there been a study investigating barriers to effective shift handover communication between doctors. As a result, any barriers to effective shift handover communication, which exist in hospitals in the Czech Republic, could remain unaccounted for, raising implications for clinical practice and patient safety. The present study was designed and undertaken in an attempt to address these issues.

The four main goals of the present study were: (i) to use the principles of critical realism to investigate whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic; (ii) to identify doctors' experiences and perceptions of the key barriers to effective shift handover communication; (iii) to explore the causes of the key barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic; and, (iv) to develop a new theoretical position, hypotheses, on how various factors and mechanisms may generate ineffective shift handover communication between doctors.

In accordance with the principles of critical realism this present study commenced with hypotheses regarding plausible barriers to effective shift

handover communication which were then tested throughout the three theory-testing phases comprising the present study. In the first theory-testing phase (Phase I), a critical appraisal of primary studies on barriers to effective shift handover communication between doctors was performed in order to test the initial hypotheses established at the outset of the present study through exploring barriers to effective shift handover communication identified in hospitals around the world. In the second, quantitative theory-testing phase (Phase II – Empirical) a questionnaire survey was conducted to further test hypotheses taken forward as plausible from Phase I. The purpose of Phase II was to explore doctors' experiences and perceptions of whether they encounter similar barriers to effective shift handover communication to the ones identified in hospitals around the world, which were identified in Phase I; also, to identify doctors' perceptions of the key barriers to handover communication. In the third, qualitative theory-testing phase (Phase III - Empirical), interviews with doctors were carried out to expand upon the results of Phase II through gaining insights into doctors' experiences and perceptions of the causes of the key barriers and to further test and expand on hypotheses accepted as being plausible in Phase II.

The study has provided evidence on barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic, and has established new causal hypotheses about how various factors, mechanisms and structures may collectively contribute to ineffective shift handover.

This chapter brings together the main findings from all the phases of the present study and describes the contribution the present study has made to the existing evidence on barriers to effective shift handover communication between doctors (Section 7.2). The findings from the present study are discussed in the light of previous research, including papers, which did not meet inclusion criteria and were rejected from the critical review of literature,

but which were held back as potentially relevant for inclusion in the discussion of the findings. In addition, the results of this current investigation are discussed in the light of papers yielded by a new literature search conducted during the interpretation of the results such as: (i) relevant discussion papers e.g. Patterson and Wears (2010b), (ii) good practice guidelines for doctors on how to conduct effective shift handover (National Patient Safety Agency and BMJ, 2004) or relevant books (Field, 2003).

In this way the chapter also introduces a new theoretical position, new hypotheses on barriers to effective shift handover communication between doctors, which have emerged from the two empirical components of the present study (Phase II and III). That is, this chapter describes hypotheses that: (i) have emerged from the present study, or, (ii) represent the initial hypotheses (previous knowledge) which did not require amendments in the light of the findings from the present study, or (iii) represent the initial hypotheses which have been enriched by insights gained from the findings from the present study. The hypotheses are presented under two main headings: (7.2.1) Effective communication between doctors at shift handover is hindered by the inadequacies of the medical education and healthcare systems, including a disruptive working environment; and (7.2.2) Effective communication between doctors is hindered by the certain features of the social context of handover. These headings have developed through each stage of the study and represent overall themes. Each theme includes one or more hypotheses. The theme hypotheses represent the roots of the problem; whereas other hypotheses represent either a single factor or mechanism, which, on its own or collectively with other factors, may decrease the effectiveness of handover communication. Each hypothesis forms a sub-section; this starts with a title, which represents the hypothesis and includes evidence supporting the hypothesis from the current study and evidence for and/or against the hypothesis from the previous studies or

relevant theories. In brackets, the researcher indicates which phase of the present study has provided the strongest evidence for a given hypothesis.

Headings representing overall themes have been changed as a result of insights gained from the findings from the present study. For example, factors or mechanisms which were initially labelled as barriers related to 'the individual performance' ['Effective communication between doctors at shift handover is hindered by insufficient clinical and communication skills of doctors'], have been assigned to either 'the inadequacies of the healthcare and medical education system' or 'the social context of handover' as these themes appeared to represent the roots of those barriers.

The chapter also discusses: what difference using the principles of critical realism made (Section 7.3). In addition, the findings from the present study, including the underlying causes of barriers to effective shift handover communication are brought together under the umbrella of human factors approach to safety. Human factors focuses on improving safety through improving the environment within which individuals work and is therefore a useful framework for interpreting the findings from present study (Section 7.4).

The chapter also includes discusses the limitations of this research, including the quality of a mixed-methods approach adopted in this present study (Section 7.5). Finally, the chapter concludes with recommendations for future research (Section 7.6).

7.2 A NEW THEORETICAL POSITION, HYPOTHESES, ON BARRIERS TO EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER

7.2.1 THEME HYPOTHESIS: EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE MEDICAL EDUCATION AND THE HEALTHCARE SYSTEM, INCLUDING A DISRUPTIVE WORKING ENVIRONMENT

A notable theme that has emerged from the questionnaire survey (Phase II) and interviews with doctors (Phase III) was lack of both training and guidelines for doctors on how to communicate during handover. This finding is consistent with previous studies (Wears et al., 2004; Behara, Wears, Perry, Eisenberg, Murphy and Vanderhoef, 2005; Cleland et al., 2009; Maughan, Lei and Cydulka 2011; Wheat, Co, Manochakian and Rich 2012) which found that doctors learn to conduct handover on the job. Absence of training and guidelines on how to conduct handover indicates that handover has not been given enough importance in the Czech Republic's healthcare and medical education systems. The absence of handover training and guidelines seemed to be the root cause of ineffective shift handover as it appeared to lead to the other important barriers to effective communication which have emerged from the present study: (i) heterogeneity of handover forms, including lack of handover standardisation in the majority of hospital departments; (ii) doctors' varied perceptions of the importance of handover, including some doctors being unaware of the importance of handover; and, (iii) the optionality of whether handover is conducted or not, left to doctors' discretion.

HYPOTHESIS: HETEROGENEITY OF HANDOVER FORMS MAY BE A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

In relation to methods of sharing information (how), the findings from the present study (Phase III) have revealed that shift handover between doctors in hospitals in the Czech Republic can be structured, semi-structured, or, most frequently, can be conducted on an ad-hoc basis. Also, that it may involve verbal and/or written exchanges of information; specifically, it

may be conducted face-to-face, over the telephone or via email. Additionally, with regard to handover participants, the findings from Phase III suggest that while in some departments the composition of handover teams is fixed, in others it is not and that shift handover may involve dyads or group of doctors.

With respect to the frequency with which handover is conducted and whether it is undertaken at all (whether, when and how often), this current investigation has shown that handover may be conducted infrequently and that it may not take place at all (we will return to this point later in this chapter when we discuss arguments for Hypothesis III).

HYPOTHESIS: DOCTORS' VARIED PERCEPTIONS OF THE IMPORTANCE OF HANDOVER ARE A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

A notable theme that has emerged from the present study (Phase III) was doctors' varied experiences and perceptions of the importance of shift handover. It is worth noting that doctors' varied perceptions of the importance of handover is a finding specific to communication between doctors at shift handover in the Czech Republic. The findings from the present study have also revealed that handover between doctors in the Czech Republic hospitals is, to a significant extent, an informal practice governed by social rules and that doctors are the ultimate decision makers

on decisions regarding its course. Therefore, discrepancies between doctors' perceptions of the importance of shift handover seem important, especially as they appeared to raise far-reaching implications for practice. For example, if some doctors perceive shift handover as meaningless, it is unsurprising that some of the interviewees reported (Phase III) that in some departments handover is not always conducted, which notion takes us to the next hypothesis.

HYPOTHESIS: THE OPTIONALITY OF WHETHER HANDOVER IS CONDUCTED OR NOT, RESULTING IN SOME INSTANCES IN THE ABSENCE OF HANDOVER (EITHER THE ENTIRE PROCESS OR SOME OF ITS COMPONENTS), IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

Another notable theme that has emerged from the present study (Phase III) was that shift handover between doctors in the Czech Republic hospitals does not always take place. The causes of the absence of handover seem to be, the ad-hoc nature of handover in some departments, some doctors' unawareness of the importance of handover, and, other factors related to the system such as inadequate handover time e.g. heavy workloads and/or non-overlapping shifts. For example, three interviewees reported that their shifts do not overlap which suggests that handover does not take place unless either a doctor who was on duty during the previous shift waits until the next shift begins, or her/his colleague arrives early.

Of relevance also is that the interviewees reported that sometimes doctors would go home at the end of the shift without either communicating in writing (e.g. completing records), or verbally (e.g. during a face-to-face meeting or over the telephone), the work carried out during the previous shift, and, that on some occasions doctors would leave a request for doctors who start their shifts without a clear rationale and go home (Phase III). In such cases, a

doctor who finished the shift had decided that any more detailed communication via a handover was unnecessary whilst the doctor who was about to start the shift and take on responsibility felt otherwise. Or, a doctor who finished early had thought that in case of an emergency, the doctor who was about to start the shift would call him/her, as handover over the telephone was discussed by the interviewees as the less effective form of handover communication (Phase III).

However, even when doctors' shifts overlap, handover may still not take place. In detail, one of the key findings from the present study is that handover seems to be optional rather than compulsory, which was evidenced by the interviewees' statements about making decisions regarding whether or not to conduct handover, and whether or not to prepare for it. That is, the interviewees' responses have suggested that some doctors believe that the necessity to conduct handover can be waived at their discretion. Lack of awareness of the significance of handover, coupled with the absence of training and guidelines, might explain why the interviewees seemed to perceive handover as optional, rather than compulsory. In addition, this finding suggests that a systemic feature (e.g. the absence of training), may lead to specific doctors' beliefs (e.g. handover is meaningless), which in turn trigger certain behaviours (e.g. doctors go home without communicating either verbally or in writing the work carried out during the previous shift), that tend towards a particular kind of outcome (e.g. the absence of handover).

Other important barriers to effective communication which have emerged from the present study were related to how well and if at all a patient's information is communicated during handover; these barriers are discussed in the next section. As such, the next section does not include the content of the handover itself.

Barriers to handover related to communicating patient information:

The findings from the present study suggest that doctors may or may not communicate essential information during handover, or, that they may communicate it inadequately. The next part of the section discusses the plausible causes of inadequate transfer of essential information during shift handover or no transfer.

HYPOTHESIS: DIFFERENCES BETWEEN DOCTORS' PERCEPTIONS OF THE IMPORTANCE OF HANDOVER IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

While some doctors' responses indicated that handover facilitates the exchanges of both clinical and managerial information, and seemed to believe that conveying information relevant to a patient's care delivery was an essential role of handover, others appeared to rely only on their own judgement and preferred to conduct an independent assessment of a patient's condition, without anyone else being involved (Phase III). In the absence of guidelines on handover forms and contents, doctors appeared to be the ultimate decision makers as to whether or not share information and if yes, what information to share. Since effective communication is heavily influenced by individuals' "mutual knowledge, mutual beliefs, and mutual assumptions" (Clark and Brennan, 1991, p. 127); if doctors' assumptions of the role(s) of handover vary, they are unlikely to communicate effectively; if at all.

Furthermore, with respect to written communication, the three theory-testing phases of the present study have confirmed that essential information may or may not be communicated or that it may be communicated inadequately, due to the messiness and illegibility of handover records (Phase I, II and III). Notably, the notion of 'messiness' has gained a new meaning relevant to the findings from the present study. Namely, when doctors discussed the

messiness of records, they were referring to illegibility but also to notions such as redundancy and lack of coherence. In addition, the results of the present study have revealed that 'messiness' is associated with doctors' capabilities, skills and experience.

HYPOTHESIS: LACK OF CLINICAL SKILLS TO ELICIT ESSENTIAL INFORMATION IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION, INCLUDING THE PREPARATION OF COHERENT HANDOVER RECORDS:

To prepare and communicate 'the story', doctors need to prioritise which information to include in and which to exclude from a handover discussion and record. That is, the findings from the present study (Phase III) have revealed that the crux of prioritising handover content is that doctors, based on their abilities, decide upon all the salient points which should be included in handover and which information should be excluded. The ability to elicit essential information is important as it is not possible to communicate effectively a complete picture of a patient's clinical condition from one caregiver to another (Behara, Wears, Perry, Eisenberg, Murphy and Vanderhoef, 2005), also, because handover happens over a short period of time.

A notable theme that emerged from the present study was that there might be significant differences between junior and senior doctors' ability to elicit essential information and prepare the patient's 'story', which further confirms that the art of communicating effectively during shift handover is learnt on the job, and understandably, increases with experience. For example, the senior interviewees believed that their handover records, in contrast to those prepared by junior doctors, are problem-focused and include essential information for the provision of a patient's care such as a treatment plan. Furthermore, some senior interviewees believed that junior doctors prepare excessively comprehensive records. The findings from the present study

regarding junior doctors preparing excessively comprehensive records are consistent with previous work by Schoenfeld on the use of written sources of information and information redundancy (Schoenfeld, Salim Al-Damluji and Horwitz, 2014). Schoenfeld's et al. study (2014) revealed that junior doctors may write very comprehensive records of all work carried out during the previous shift, as they rely heavily, unlike senior doctors, on written sources of information (Schoenfeld et al., 2014). The plausible negative effect of excessively comprehensive content on handover communication may be that it may lead to "the intended message to be buried in irrelevant, unwanted information..." (Lardner, 1996, p. 5).

Furthermore, preparing excessively comprehensive records and verbal summaries of clinical cases can be associated with the ability to elicit essential information for the provision of a patient's care, which requires both diagnostic and narrative competencies (Hammer, Rian, Gregory, Bostwick, Barrett, Chalfant, et al., 2011). For example, Hammer et al. (2011) used role-playing to improve medical students' 'narrative competences', namely, the ability to present clinical cases and "...to acknowledge, absorb, interpret, and act on stories and plights of others" (Charon, 2001, p.1897).

Elstad et al. (2010) explored how experience influences clinical decision-making and found that work experience enhances "complex social, behavioural and intuitive wisdom" (p. 1733). Intuitive wisdom, in turn, improves doctors' decision-making skills (Elstad et al., 2010): 'What physicians gain over time is complex social, behavioural and intuitive skills and knowledge about how to 'read' social/behavioural cues, intuit signs beyond the patient's words, and compare the present day patient against similar past patients" (Elstad et al., 2010, p. 1733). In general, tacit knowledge is essential in order for professionals to understand the nitty-gritty of organisational function, operations and systems (Senge and Sterman, 1991). That is, senior doctors may have some intuitive skills and knowledge,

whether it is intuitive, where clues on what you are being told trigger thoughts, and obviously senior people have more of these kinds of triggers etc., sources of knowledge from which to draw to, to make a diagnosis.

Other studies, however, suggested that doctors' experience measured by age or years of employment may be negatively associated with the provision of high quality patient care (Choudhry, Fletcher and Soumerai, 2005). For example, experienced doctors may not adhere to best practice guidelines, either because they may be unfamiliar with them or because they disagree with recommendations (Choudhry et al., 2005). On the other hand, Samuels and Ropper (Samuels, 2005) found that adherence to guidelines does not necessarily enhance the quality of patient care and that experience equips doctors with subtle skills, which are not identifiable through standard performance measures but which are imperative for the provision of health care (Samuels, 2005). For example, an art expert could tell immediately that a painting is a fraud, due to 'shortcuts in thinking' and the ability to draw upon subtle clues which a novice might not have noticed (Allmark, 1998). With relevance to the present study it might be that a senior person might expect a junior person to "spot the fraud", whereas the young person might not have skills to do so.

The importance of being able to elicit essential information may explain why the interviewees' responses have indicated that judgement of a doctor's ability is inherent in handovers, especially those involving doctors who are not well acquainted with each other. In addition, the findings regarding junior doctors being less able than senior doctors to elicit essential information may explain why some senior interviewees seemed disappointed with those of their peers whom they perceived as being reluctant to spend time teaching junior doctors. These senior interviewees discussed the necessity of longer, more detailed handovers if they involved junior doctors (Phase III). Supporting junior doctors during handover leads us to the discussion about

another barrier to shift handover communication which has emerged from the present study:

HYPOTHESIS: LACK OF TEACHING JUNIOR DOCTORS DURING HANDOVER IS A BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

The question we may want to ask is: 'whether teaching should be the role of handover when senior and junior doctors are involved?'. The answer seems to be 'yes', since a safe handover cannot be performed without teaching, especially when it involves junior doctors who may lack capabilities and skills to elicit essential information for the provision of a patient's care. Furthermore, handover seems to present the perfect opportunity for doctors to learn, as learning can happen through observing behavioural patterns that communicate messages as well as via verbal communication (Walsh and Ungson, 1991).

The notion of handover as a teaching tool also emerged from research on nursing handover, where the process has been identified to support informal learning (Jordan P., 1991; Strange, 1996; Kennedy, 1999; Manias and Street, 2000; Sexton et al., 2004; Yonge, 2008). In detail, previous studies on nursing handover identified that a handover discussion provides nurses with the opportunity to: (i) learn clinical skills (Ashford and Black, 1996; Manias and Street, 2000); (ii) socialise; (iii) become familiar with 'rituals', namely, repetitive, symbolic actions and behaviours (Riegel, 1985; McFertidge et al., 2007). This suggests that learning to conduct handover on the job might be the optimal method. However, a notable theme, which emerged from the results of the present study, was that different senior doctors could have different attitudes towards teaching junior doctors during handover. The interviewees' responses have implied that while some senior doctors would willingly support juniors, others would not. Unwillingness to teach junior

doctors appeared to be linked to some senior doctors finding junior doctors arrogant and rude. Other measures could be taken to help junior doctors elicit essential information and thus increase handover effectiveness in instances where they were unable to obtain help from senior colleagues, for example, a clinical minimum data (information) to describe various health conditions could be specified at the departmental level. This was not the case, however, in the Czech Republic hospitals where the present study was conducted.

The next section discusses how lack of specification of minimum necessary clinical information for a specific condition could plausibly contribute to ineffectiveness of shift handover communication and information omissions.

HYPOTHESIS: LACK OF GUIDELINES ON HANDOVER CONTENT INCLUDING A SPECIFICATION OF THE KEY DISEASE-SPECIFIC CLINICAL INFORMATION AT THE DEPARTMENTAL LEVEL IS THE BARRIER TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS:

While we could interpret differences in handovers contents as the representation of doctors tailoring contents to adequately describe various medical conditions, the problem may emerge if different doctors use different information to describe the same medical condition. The results of Phase III of the present study have revealed, as mentioned above, that a clinical minimum data (information) to describe specific health conditions was not specified in hospitals in the Czech Republic at the departmental level.

Of relevance, there has been an on-going debate amongst patient safety researchers whether handover should be standardised, and evidence on effectiveness of handover standardisation is equivocal (Aron, Dutta, Janakiraman and Pathak, 2011). Some researchers advocate adopting a standardised content template (Arora, Johnson, Lovinger, Humphrey and Meltzer, 2005). However, others claim that structuring handover content is

likely to be challenging, because, shift handover between doctors in hospitals is a complex process as patients' conditions vary and data overload prevails (Batalden, Davidoff, Marshall, Bibby and Pink, 2011). Those who are against implementing a handover proforma further argue that adopting a handover template does not guarantee the inclusion of essential information (Schoenfeld et al., 2014). Overall, while we cannot draw a definite conclusion regarding whether the content of handover should be standardised or not, most likely certain level of standardisation could enhance junior doctors' ability to elicit essential information.

In addition, to enhance the quality of an exchange of written information, one of the participating hospitals had adopted a Handover Information Technology tool. Its effect on the information transfer during handover is discussed in the next section.

HYPOTHESIS: INADEQUATE COMMUNICATION AIDS – INFORMATION TECHNOLOGY (IT) HANDOVER SYSTEMS. ELECTRONIC RECORDS PRESENT OBSTACLES TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

The interviewees reported that despite the increased use of IT systems in the Czech Republic hospitals, (Phase III), IT systems might be misused and add additional challenges to conveying information at handover. While the quantitative Phase II has revealed no statistically significant differences between junior and senior doctors' experiences and perceptions of the key barriers to effective shift handover communication, the researcher's overall impression from the interviews was that junior doctors were more technologically attuned than their senior colleagues. This was further evidenced by the fact that four senior and only one junior doctor have raised dissatisfaction with IT handover systems (Phase III). These interviewees believed that attempts to improve the effectiveness of handover communication through the adoption of IT handover tools did not improve the

quality and usefulness of its content, but that it led to unforeseen problems. For example, the interviewees reported that after the implementation of the IT system some of their colleagues started copying and pasting information in handover records, without either updating or interpreting the data (Phase III). These results relate to the findings from Abraham's et al. study (Abraham, Kannampallil, and Patel, 2012) that identified that information systems do not reduce interpretation errors unless they are supported by training aimed at improving doctors' clinical judgement. Furthermore, Abraham et al. (Abraham et al., 2012) posited that any handover system is unlikely to improve the quality of information if practitioners ignore it. The results of the present study have revealed that the Czech Republic doctors might have a number of legitimate reasons for 'ignoring', 'misusing' or 'not fully utilising' the IT systems, such as overwhelming workload, which may also explain why the adoption of IT handover tools have been unsuccessful. Furthermore, if doctors do not utilise IT handover systems, it may also mean that their implementation is inadequate.

HYPOTHESIS: LACK OF POLICY PROTECTING DOCTORS WHEN THEY DOCUMENT UNCERTAINTY REGARDING A PATIENT'S CONDITION AND A TREATMENT PLAN; FEAR OF LEGAL CONSEQUENCES OF ADVERSE EVENTS; AND, A TRANSFER OF ERRONEOUS INFORMATION, CONSCIOUSLY OR UNCONSCIOUSLY, ARE BARRIERS TO EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER:

Additionally, the findings from the qualitative Phase III have shown that some doctors fear the legal consequences of adverse events, which has emerged from the present study as another plausible reason for doctors' reluctance or failure to complete handover records, to which point we shall return later on in this chapter. For example, some doctors wouldn't document clinical uncertainty for fear a patient or his/her relatives would bring a lawsuit against them. If doctors do not document uncertainty and complete handover records

partially, this also means that they do not utilise IT systems. Therefore, the context in which IT handover systems are implemented has emerged in the present study to be as important as the quality of the systems themselves. Indeed, the findings from the present study have confirmed that doctors may not include essential information if, for various reasons, they prefer to keep it confidential.

Furthermore, another notable theme that has emerged from the present study was that communicating handover content may be unfulfilled or fulfilled inadequately because doctors can give unintentionally or intentionally inaccurate information. That is, the results of the present study have revealed that doctors either might alter handover content, or, provide inaccurate/false information, for example, to hide errors or mistakes, or to transfer responsibility for care delivery to their colleagues (Phase III). Therefore, if there were guidelines on how to communicate effectively during handover and which information to convey, there is no guarantee that doctors would follow them.

Concerning the unavailability of essential information for the provision of a patient's care, the initial hypothesis that out of date records present barriers to effective shift handover communication has been confirmed by the three theory-testing phases of the present study (Phases I, II and III). While we briefly covered the content of handover (what), another aspect of handover is how this information is shared between participants. For example, doctors could enhance the effectiveness of handover through employing communication strategies; the results of the present study, however, have revealed that the Czech Republic doctors rarely do so.

HYPOTHESIS: LACK OF COMMUNICATION SKILLS, INCLUDING NOT USING EFFECTIVE COMMUNICATION STRATEGIES IS A BARRIER TO EFFECTIVE SHIFT HANDOVER BETWEEN DOCTORS:

'Lack of communication skills' is used in this section to describe the absence of strategies and techniques, which may enhance the effectiveness of communication. On the contrary, good communication skills may include the use of techniques, which facilitate effective communication, some of which are discussed below. While effective communication between handover participants could enable them to transfer all the salient points for patient care and to assess the validity and accuracy of actions undertaken during the previous shift, ineffective communication rendered communicating essential points as well as utilising these potential roles of handover highly unlikely. A notable theme that has emerged from the present study was that lack of communication skills is a barrier to effective shift handover communication. Effective communication is described in this section as the one in which individuals use strategies and techniques which may enhance the effectiveness of communication. Absence of such strategies is described as inadequate communication. Various communication channels exist and they differ from one another in their capacity to facilitate effective communication. The following section explains the principles of effective communication, using the notion of conduit metaphor, to assist the interpretation of how the methods of communication reported by the interviewees may either enhance or decrease the effectiveness of shift handover (Phase III). The 'conduit metaphor' notion originates from work evaluating the effectiveness of communication channels (Reddy, 1979; Daft and Lengel, 1984) and handover (Lardner, 1992). The notion may explain the causes of ineffective shift handover communication (Kerr, 2002). That is, the conduit metaphor posits that the speaker or writer places concepts, thoughts, feelings, meanings and ideas into a "container" (Reddy, 1979). Communication takes place when individuals use this container filled with concepts, thoughts and

ideas to hand over information to their colleagues (Reddy, 1979). The speaker expects the receiver of information to understand what s/he intended to get across but this is not always the case as the receiver creates her/his own meaning from the content conveyed (Reddy, 1979; Lardner, 1992; Robinson and Lardner, 1998). Potential misunderstandings therefore would be accepted as 'a norm' (Reddy, 1979). To lessen the likelihood of misunderstandings, handover participants should utilise communication strategies and techniques, such as: asking questions to prevent any misunderstandings; repeating the content conveyed using more than one communication methods during handover, written (e.g. electronic or paper records) and verbal (e.g. a face-to-face discussion); or, through providing feedback (Reddy, 1979; Daft, and Lengel, 1984; Robinson and Lardner, 1998; Lardner, 1992; Kerr, 2002). The presence of feedback makes communication cyclical and dynamic and hence, it allows for the detection of misunderstandings, explanations and clarifications (Berlo, 1960; Rasberry and Lemoine, 1989; Lardner, 1992; Odell, 1996; Robinson and Lardner, 1998). It occurs when an individual who receives information, in turn communicates with an individuals who gives information. The advantage of using feedback and using different communication methods is that it is likely to facilitate handover participants' understanding of handover contents and thus, achieving mutual understanding (Lardner, 1992; Odell, 1996; Arora, Johnson, Meltzer and Humphrey, 2008). In addition, Lardner (Lardner, 1992) claims that feedback increases accuracy and confidence in handover communication. In the present study only a few interviewees reported using strategies to enhance the effectiveness of communication, such as asking questions or providing feedback; as such, a failure to use communication strategies is a barrier. In addition, being acquainted with participants seemed to increase doctors' confidence in handover communication.

While some interviewees believed that in-person communication reduces medical error rates, they reported that face-to-face communication with the aid of written records was used only in some departments. In other departments doctors appeared to communicate verbally or in writing only, for example, face-to-face, over the telephone, without referring back to records (written sources of information), or via emails (Phase III). As for other communication strategies, some interviewees reported withdrawing from handover when they felt a discussion was unsatisfactory, as opposed to trying to communicate effectively, for example by asking their colleagues questions.

Additionally, in the present study, handover communication has been identified to provide doctors with an opportunity to deal with uncertainty. In relation to dealing with uncertainty, research on cognitive errors in medicine has shown that: "Where there is uncertainty... there is a need for clinical reasoning and decision making; both of these processes show considerable vulnerability to error" (Croskerry, 2005, p. 241). Previous research on handover in medical and non-medical fields suggests that handover provides an opportunity for participants to ask for a second opinion and check information, to clarify ambiguities (Daft and Lengel, 1984; Lardner, 1992; Robinson and Lardner, 1998; Beach et al., 2003; Wears et al., 2004). Furthermore, handover may increase confidence in clinical decisions by allowing participants to set expectations for treatment, including contingency plans (Wears et al., 2004; Apker, Mallak and Gibson, 2007; Alem, Joseph, Kethers, Steele, Wilkinson, 2008; Patterson, 2010). The findings from the present study (Phase III) have revealed that both junior and senior doctors perceived exchanging information during shift handover as an opportunity to ask for advice on a patient's course of treatment. This was evidenced by a couple of interviewees who reported seeking their colleagues' opinions when they were uncertain about a patient's condition. However, as it will be

discussed in detail section 7.3, on some occasions, doctors were reluctant to talk openly with their colleagues and to ask them for a second opinion.

HYPOTHESIS: THE INADEQUACIES OF THE SYSTEM RESULTING IN DOCTORS NOT BEING HELD ACCOUNTABLE FOR FAILURES TO COMPLETE HANDOVER RECORDS ARE BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

The findings from the present study have suggested that some doctors do not feel accountable to hospital managers to maintain handover records. Indeed, failure to complete records emerged in the present study as not resulting in any repercussions for doctors, which may explain the reason why some doctors may neglect this activity (Phase III). This finding further substantiates the hypothesis that the inadequacies of the healthcare systems reflected, for example, in poor management, have a negative effect on the effectiveness of handover communication. However, the findings from Phase III have provided insights into plausible root causes of poor management, such as limited financial resources, resulting in heavy workload of hospital staff. The results of Phase III have also suggested that despite limited financial resources, hospital managers were making efforts to improve the quality of shift handover communication, for example, through implementing handover software tools (IT). Unfortunately, any attempts to improve handover communication through the adaptation of the IT handover systems proved futile. However, doctors' failures to keep handover records up to date seemed to have other causes, such as their professional identity.

HYPOTHESIS: DOCTORS' PROFESSIONAL IDENTITIES AND WORK ETHIC MAY PRESENT BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS:

The findings from the qualitative Phase III have shown that completing administrative tasks was imposed upon doctors, which was evidenced by the

fact that all study interviewees, except one, expressed immense frustration with the amount of documents they were required to complete. Furthermore, a notable theme that emerged from the present study was that professional identities seemed to get in the way of some doctors completing administrative duties such as completing handover records (Phase III). That is, an additional layer of frustration regarding completing handover records seemed to arise from doctors' perceptions of their role e.g. where they view administrative duties as incongruent with their professional identities. The interviewees' responses indicated that for some doctors the necessity to complete records meant they had less time for their 'real job', providing care to patients. Indeed, some doctors believed that providing care to patients was almost their only responsibility, and they did not seem to consider completing records as their 'real' job. This finding indicates that some doctors' perception of what their job is, their professional identities as well as their work ethics may be an obstacle to effective handover if they 'prevent' doctors from completing patients' records. On the other hand, if doctors are burdened under heavy workloads, then completing records may mean that they have not got enough time to see their patients.

While the above factors indicate that the system may not 'facilitate' efficient information exchange, some doctors themselves did not seem to perceive conveying clinical information (e.g. completing handover records) as their job. Unwillingness to complete records, coupled with insufficient handover time suggests that factors related to the individual performance and the system may collectively contribute to ineffective communication at shift handover. These findings also imply that the categorisation of barriers to handover into distinct groupings such as factors related to the individual performance, environment and system, although helpful, does not adequately reflect the complexity of the context of handover and is insufficient to explain how

various factors and mechanisms may collectively contribute to ineffective communication at shift handover.

The next section illustrates barriers to handover arising from a disruptive working environment, lack of time and poor workforce planning.

HYPOTHESIS: LACK OF TIME, POOR WORKFORCE PLANNING, BUSY PERIODS IN THE DEPARTMENT, LACK OF DISTRACTION-FREE HANDOVER LOCATIONS AND INTERRUPTIONS ARE BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

In relation to environment and system factors, the three theory testing phases of the present study revealed that doctors' ability to communicate effectively was impeded by the other system-related factors such as poor workforce planning, busy periods in the department, lack of distraction-free handover locations and interruptions. In addition, limited financial resources resulting in staff shortages were identified by the participants as having negatively affected their ability to communicate effectively at handover.

7.2.2 THEME HYPOTHESIS: EFFECTIVE COMMUNICATION BETWEEN DOCTORS IS HINDERED BY THE CERTAIN FEATURES OF THE SOCIAL CONTEXT OF HANDOVER

HYPOTHESIS: DISTRUST, POOR WORK RELATIONSHIPS BETWEEN DOCTORS AND FEAR OF LEGAL CONSEQUENCES ARE BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS:

The findings from the qualitative Phase III have highlighted the instrumental role of trust in determining the process and outcomes of communication at handover, and the interviewees' responses (Phase III) have suggested that distrust and poor working relationships between colleagues might negatively influence the effectiveness of shift handover communication. That is, the interviewees' responses suggested that to make a decision as to whether to conduct handover or not, they would take into account the certainty of a patient's medical condition. Where diagnoses were uncertain and doctors did not know what to do, they were keen to participate in handover, but only if they felt as if they could trust their colleagues. In other words, a patient could be unstable and doctors could still decide not to undertake handover if they did not place trust in their handover counterpart and, most likely, the system. The next section discusses this barrier to handover - distrust - in detail.

The interviewees' responses conveyed a perceived need to be vigilant at handover. A notable theme that emerged was that there seemed to be two kinds of problems related to trust, these are discussed below:

(i) Distrust: Whether or not to trust colleagues not to reveal your own confidential information (e.g. when communicating clinical uncertainty or errors):

The interviewees' responses suggested that this type of mistrust was associated with whether or not doctors felt they could trust their colleagues,

but also with lack of trust in the system. That is, the fear of lawsuits and legal consequences seemed to discourage doctors from communicating and documenting clinical uncertainty and adverse events. In fact some senior doctors stated that junior doctors do not document errors including adverse events. These findings further substantiate the hypothesis that the inadequacies of the systems present barriers to effective shift handover communication between doctors. In addition, a notable theme that has emerged from the study was that some interviewees appeared to be apprehensive about revealing uncertainty or information about adverse or sentinel events because they perceived their colleagues as being potential whistle-blowers (Phase III). These findings also provide additional insights as to why doctors may not complete handover records.

Although the present study did not explore whether or not in reality doctors document uncertainty and adverse events, previous research has shown that surgeons often exclude from records information about operative complications (Baigie et al. 1994; Lefter et al. 2008). In the present study, the fear of documenting clinical uncertainty and adverse events seemed to be associated with the so-called blame culture, where blaming individuals for mistakes is a dominant characteristic of an organisation (Vincent 2010). Unsupportive working relationships and forming judgement about colleagues' actions seems to be inherently embedded in social and working relationships taking place in a blame-culture environment in hospitals in the Czech Republic. In the present study, unsupportive working relationships emerged as a potentially negative effect on handover effectiveness as they could lead to its absence.

The second trust-related barrier was related to the authenticity of a patient's information conveyed by colleagues.

(ii) Mistrust: Whether or not to trust the accuracy of information from other colleagues:

A number of interviewees casted doubts upon the authenticity of a patient's information communicated during handover and seemed to have two reasons to do so.

Firstly, the interviewees believed that a colleague could downplay the acuteness of a patient's condition, as the colleague might have other agendas than a patient's wellbeing, for example, the aim to get the care of a critically ill patient to be taken over by an oncoming doctor (a doctor who starts the shift). Significantly, downplaying the severity of a patient's condition, seemed socially acceptable and normal, if it was for the patient's sake, which may explain why during interviews doctors did not express any regret. For example, one interviewee stated: *"...information may need to be adjusted to prevent them from saying: 'I don't want him (the patient) here as I am taking the risk, I don't know what to do with him'... so information is adjusted."* Downplaying the acuteness of a patient's condition may represent dishonest reporting of physical examinations and therefore the findings from the present study bear some resemblance to a study by Dyrbye et al. (2010) who identified dishonest reporting of physical examinations as the most frequently reported unprofessional behaviour.

Secondly, the interviewees reported assessing whether their handover counterparts have enough experience, sufficient knowledge and skills to elicit the essential information for the provision of patient care.

Effects of distrust: The level of doctors' trust in their counterparts seemed to determine whether or not doctors decided to participate in handover. It also seemed to determine the course of the entire handover process. That is, the interviewees' responses indicated that distrust could prevent doctors from

undertaking a number of handover-related activities, such as: (i) Not engaging in a handover discussion; (ii) Documenting the work carried out during the previous shift, and adverse events; (iii) Verbal communication of clinical uncertainty, including seeking a second opinion or advice; and, (iv) Dealing with clinical uncertainty. For example, as discussed above, some doctors appeared to feel that they could not place trust in some of their colleagues. Consequently, while handover provides doctors with an opportunity to discuss patients' cases, and thus detect and clarify misunderstandings, if doctors do not ask their colleagues for help, they eliminate a potential means of identifying mishaps. These findings suggest that distrust and poor working relationships between colleagues, as well as not seeking advice or revealing uncertainty present obstacles to effective shift handover communication, and, most likely, to safe and high quality patient care

In addition, placing trust in colleagues in a workplace and in another setting has been linked to the notion of Social Capital (SC) understood as "...shared norms, values and understandings that facilitate co-operation within or among groups..." (Cote and Healy, 2001, p.41). Social Capital is developed through "networks and connectedness" (the asset pentagon) in which networks can be horizontal (interactions between peers) and vertical (interactions between clients and sellers) (Field, 2003). Social Capital implies benefit, which individuals can derive from relationships based on trust and a high degree of shared values (Field, 2003).

A certain level of trust is necessary for people to benefit from Social Capital (Coleman, 1994). The elements of social capital such as trust and reciprocity decrease the costs of working together and they may enhance job satisfaction, as it has an impact on individuals' identify and belonging (Coleman, 1994). On the other hand, however, poor working relationships between colleagues, e.g. characterised by the hierarchy may have a negative

effect on Social Capital (Coleman, 1994). It seems as though conditions necessary for Social Capital to operate are also necessary for effective shift handover communication between doctors, for example, one of such conditions is certain level of trust. While the results of the present study have not revealed clear links between Social Capital and handover effectiveness, it seems likely that handover could be used as an exemplar which demonstrates the quality of working relationships. That is, handover could be seen as a prism through which to see some of the complex factors that affect decisions and behaviours of staff such as agendas, hierarchy, shift patterns and staffing levels.

Furthermore, the presumption that trust plays a crucial role in the process substantiates the findings from the present study which have suggested that handover is, to a significant extent, a social process. In the present study, for example, distrust towards colleagues or towards the system, seemed to determine what, if any, handover activities doctors might undertake. Of particular importance, the results have suggested that implicit rules prevail and that handover is governed mainly by implicit rules, social relationships between doctors as well as doctors' experiences and perceptions of what is 'safe' to do within the system, e.g. whether or not to document a clinical uncertainty (Phase III). The hypotheses that handover is an informal process and that informal practices prevail was further confirmed by the findings from the present study related to the division of responsibilities between doctors; we shall discuss it in the following section.

HYPOTHESIS: SOCIAL PRACTICE: UNCLEAR DIVISION OF RESPONSIBILITIES AND CHALLENGING INTERPERSONAL RELATIONS/DISTRUST ARE BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION BETWEEN DOCTORS:

Transferring authority and responsibility:

The first three theory testing phases of the present study have confirmed that blurred division of responsibility presents a barrier to effective shift handover communication. There was no clear mechanism allowing doctors to transfer responsibility for patient care, especially in cases when handover did not take place. As regards another plausible role of handover - transferring authority and responsibility for patient care, the results of all three theory-testing phases have revealed that unclear division of responsibility itself is a barrier to effective shift handover. Firstly, the interviewees stated that usually doctors assume responsibility 'automatically', at the beginning of their shift (Phase III). These responses indicate that the transfer of responsibility and authority for patients' care between doctors in the Czech Republic might take place without either verbal or written exchange of a patient's information; this suggests that a doctor may start a shift not fully understanding the situation on the ward, including patients' clinical conditions and treatment needs.

In addition, while the first two theory testing cycles have shown that blurred division of responsibility is a barrier to handover communication, the contribution of Phase III to the understanding of the notion of "responsibility" is that some senior doctors might use a handover meeting to unevenly allocate the workload among doctors on duty and to delegate their own responsibilities to juniors. That is, the interviewees stated that a number of senior doctors pass on to junior doctors tasks that are outside the remit of handover. Consequently, the findings from the present study suggest that unclear division of responsibility is a barrier to an effective handover (Phase II and III) and overall, the three theory testing phases of the present study have confirmed an initial hypothesis that unclear division of responsibility is a barrier to handover communication.

These unevenly divided work responsibilities seemed to be a source of tensions between junior and senior doctors, which partly explains why the findings from Phase II have revealed that communication between junior and

senior doctors is a significant obstacle to effective handover. The interviewees felt that collaboration with some senior doctors was very challenging and they believed that some senior doctors impose discipline over other doctors. These findings bear resemblance to previous work by Light (1993) and Scott (1985) who posit that experienced doctors behave in an autocratic manner. Of relevance to the findings from the present study, Barker and Cheney (1994) described how discipline might operate in an organisation in negative ways if greater autonomy and higher values does not underlie work relationships, which seemed to be the case in hospitals in the Czech Republic; this finding was further substantiated by one interviewee's statement that some doctors are more concerned about making money than about the wellbeing of patients.

In addition, authority as well as doctors' personalities might have a negative effect on the effectiveness of handover communication. A personality problem may present a barrier to effective shift handover communication if a doctor with a personality problem has enough authority and power to export that problem to others. Certain behaviour could have either immediate effect on the work during the next shift, or, a long-term effect on the dynamics and nature of handover practice. For example, if senior doctors use handover to unevenly allocate the workload, they may set a bad example to junior doctors because the acquisition of tacit knowledge is 'a co-product' of individuals' experiences (Wagner and Sternberg 1985). Furthermore, by setting a bad example, senior doctors may establish hard to change (long-term) behavioural handover patterns especially as learnings can be retained not only in the memory of individuals but also in the organisation memory (Walsh and Ungson, 1991).

The next hypothesis represents another barrier to effective shift handover communication between doctors related to the social context of handover.

HYPOTHESIS: CHALLENGING RELATIONSHIPS BETWEEN JUNIOR AND SENIOR DOCTORS AND BEHAVIOUR OF SOME SENIOR DOCTORS, E.G. UNFAIR ALLOCATION OF WORKLOAD AMONG STAFF ARE BARRIERS TO EFFECTIVE SHIFT HANDOVER COMMUNICATION:

Overall, these findings suggest that there might be a certain level of hostility between junior and senior doctors, which, in turn, might negatively affect the effectiveness of shift handover communication.

The findings from the present study revealed that some senior doctors believed that junior doctors are abrupt, nonchalant and rude (Phase III). It might be that if senior doctors use handover to delegate excessive workload to juniors, junior doctors may try to be assertive but come across as rude, especially if they are anxious about the prospect of overwhelming workload. It may also be that senior doctors expect junior doctors to unquestioningly follow their orders. The overall impression from the interviews was that there might be a role conflict regarding junior doctors' performance; namely, junior doctors were expected to act independently and confidently. However, the findings from the present study have revealed that if junior doctors acted in a confident manner, this seemed to cause growing tensions between juniors and seniors, and senior doctors also appeared to find juniors arrogant and rude.

These findings resemble the findings from previous research on various kinds of handovers reporting the presence of tensions between participants (Kerr 2002; Wears 2005; Apker et al. 2007; Alem et al. 2008). For example, the findings from the present study related to tensions are consistent with previous studies by Kerr (2002) on nursing shift handovers and by Apker et al. (2010) on doctors' perceptions of inter-departmental handover between doctors in the Emergency Department and admitting units. Kerr's (2002) qualitative study included observations of shift handover, demonstrated that tensions are inherently embedded in handover practices and practitioners'

ability to manage those tensions heavily affects handover effectiveness. Apker's et al. (2010) study revealed that doctors in the Emergency Department and in admitting units have different expectations regarding what should happen during, and, as a result of, handover. Doctors believed that these differing expectations as to what should happen during handover might lead to misunderstandings and thus, decrease the effectiveness of handover communication, lead to near misses, adverse events and unnecessary repetitions of laboratory tests (Apker et al. 2010). Previous and current studies have confirmed that tensions are inherent in handover and may have a negative effect on its effectiveness. The contribution of the present study to understanding 'tensions' between handover participants is that they do not only relate to handover itself, but to doctors' roles and their social position.

In addition, if open criticism is not allowed, that is, if junior doctors are discouraged from challenging their seniors' opinions, communication between junior and senior doctors is unlikely to be effective. 'Inability' to challenge seniors' authority finds theoretical support in the work of Karl Popper. In his book 'The Open Society and Its Enemies' (1945), Popper rejects the commonly believed notion that dictatorships are efficient but (unfortunately) bad for human rights; he posits instead that they are inefficient, as they do not permit open communication and criticism. In accordance with the Popper's notion of ineffective dictatorship, in the present study, dictatorship expressed as the hierarchy seemed to prevent honest, effective communication at handover and, most likely, beyond.

Furthermore, according to Maanen and Schein (1979), those who have been working longer in an organisation have more impact on practice than newcomers. That is, their 'definitions and experiences' of 'the reality' and of how things should operate, are likely to be enacted, unlike those of newcomers (Maanen and Schein 1979). Consequently, senior doctors' perceptions of what should happen during shift handover are likely to have

more effect on practice than those of junior doctors, which might be an additional source of frustration for juniors. Irrespective of the sources of tensions, they most likely have serious negative implications for handover effectiveness.

Overall, the results of the present study have indicated that shift handover communication between doctors working in hospitals in the Czech Republic is, to a significant extent, informal and governed by social rules. Of note, the handover process emerged as a prism through which to see some of the complex factors that affect decisions and behaviours of staff e.g. hidden personal agendas, hierarchy, shift patterns or staffing levels.

7.3 THE USE OF CRITICAL REALISM TO EXPLAIN BARRIERS TO HANDOVER COMMUNICATION

7.3.1 CRITICAL REALISM EPISTEMOLOGY

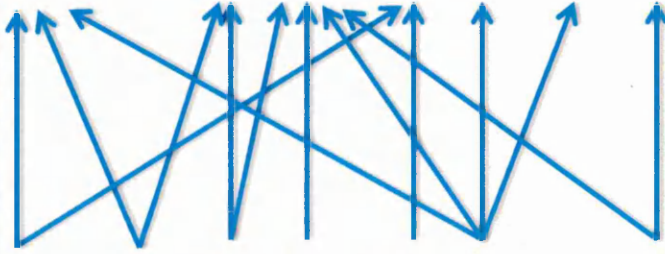
The use of critical realism has affected the conduct of the present study in a number of ways. Critical realism is a theory-led approach and in a kind of obvious way it has affected the order in which research methods were employed in the study, with a critical review of literature leading as a phase of a theory-testing and development rather than identifying gaps in research evidence. More substantially, critical realism has affected the epistemological stance of the thesis, in that it has taken the fallibilist position. The study started from one theoretical position of theories and hypotheses to be tested and it ended in a new theoretical position, with a new hypotheses. In practical terms it means that new research in this area needs to begin from this point - a new theory/a number of hypotheses on how various factors and mechanisms may collectively contribute to ineffective shift handover communication between doctors working in hospitals in the Czech Republic, which has emerged from the present study.

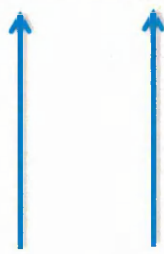
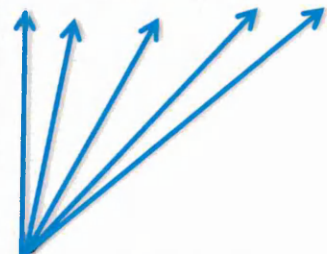
7.3.2 CRITICAL REALISM ONTOLOGY

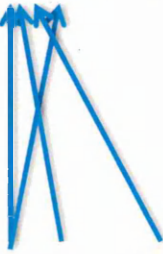


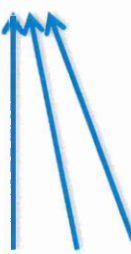
Turning from epistemology to ontology, critical realism asks us to think of the real world in terms of depth, that is, in terms of factors, mechanisms and processes that result in phenomenon we observe. In this study several points of observation were made in a different phases. From these factors, mechanisms and processes tending against successful handover communication between doctors have been suggested. This is set-out in the hypotheses above and it is illustrated in the table below. The table provides example of how various factors and mechanisms that make up the different


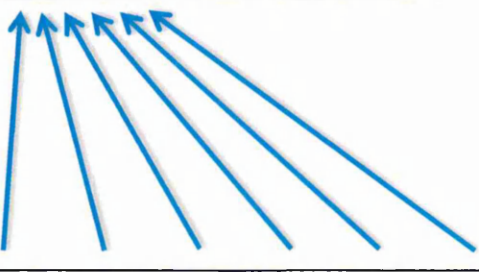
contexts in which handover occurs, may collectively contribute to ineffective communication between doctors (outcomes).

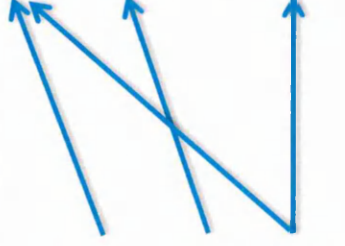
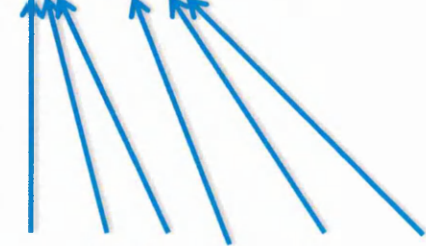
Table 7.1 A visual representation of plausible causes of ineffective shift handover communication between doctors and their plausible consequences (unavailability of essential information for the provision of a patient's care)

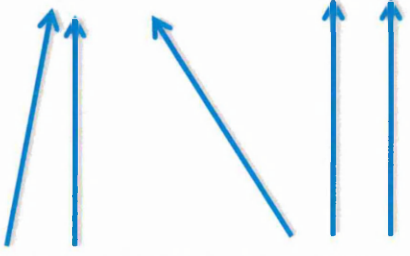
Examples of hypotheses on how various factors, context and mechanisms can collectively contribute to ineffective shift handover communication (outcomes).			
Context	Mechanisms		Outcomes
Inadequacies of the healthcare system	Lack of guidelines on: how handover should be conducted/how doctors should communicate during handover.		Varied frequency with which handover is conducted.
	Handover is a heterogeneous, informal and social practice.		Transfer of responsibility and authority for a patient's care takes place without either verbal or written exchange of essential information about a patient's medical condition and treatment needs.
	Some doctors may have little or no awareness of the importance of handover.		Doctors do not prepare for handover.
	Some doctors perceive handover as optional (this indicates that on some occasions they may perceive handover as unnecessary)		No handover: doctors go home without communicating either in writing or verbally essential information for the provision of a patient's care.
	Some doctors perceive handover as meaningless.		Handover records may be left incomplete.
	Doctors are the ultimate decision makers as to whether or not handover takes place.		Information about the work carried out during the previous shift is unavailable.
	Doctors are the ultimate decision makers for decisions as to whether or not to complete handover records.		Oncoming doctors' [those who start their shift] decisions might be based on incomplete information.

	<p>Doctors prefer to conduct an independent assessment of a patient's medical condition, without anyone else being involved.</p> <p>Doctors' perceptions of what should happen during handover vary.</p> <p>Doctors communicate information without referring to records (written sources of information about a patient's medical condition).</p>		<p>Doctors prefer to conduct an independent assessment of a patient's medical condition, without anyone else being involved - if they suspect colleagues may challenge their decisions during a handover discussion they may decide not to participate in handover.</p> <p>If doctors' perceptions of what should happen during handover vary and they are unlikely to communicate effectively and unlikely to achieve mutual understanding.</p> <p>Incomplete or inaccurate information is communicated during handover.</p>
Other inadequacies of the healthcare system	Lack of handover time: Shifts do not overlap; Heavy workload, including heavy administrative workload.		<p>Varied frequency with which handover is conducted.</p> <p>Doctors do not prepare for handover.</p> <p>No handover: doctors go home without communicating either in writing or verbally essential information for the provision of a patient's care.</p> <p>Handover records may be left incomplete.</p> <p>Oncoming doctors' (those who start their shift) decisions are based on incomplete information.</p>

Other inadequacies of the healthcare system	<p>Lack of policy regarding the division of responsibility.</p> <p>Some senior doctors' unevenly allocate workload amongst doctors on duty.</p> <p>Some senior doctors delegate their work responsibilities to junior doctors.</p>		<p>Tensions between handover counterparts.</p> <p>Ineffective communication at shift handover.</p>
Other inadequacies of the healthcare system	<p>Inadequate communication aids e.g. information technology system.</p> <p>The inadequate implementation of the IT handover systems makes it possible for doctors to copy and paste information in handover records, without either updating or interpreting the data.</p>		<p>IT handover systems are misused and, as a result, add additional challenges to handover communication.</p> <p>Ineffective written communication at shift handover.</p> <p>Electronic handover records are not updates.</p>
Other inadequacies of the healthcare system	<p>Lack of policies protecting doctors when they document uncertainty.</p> <p>Fear of legal consequences: doctors do not document uncertainty for fear a patient or his/her relatives would bring a lawsuit against them.</p>		<p>Handover records left incomplete.</p> <p>Transfer of erroneous information.</p> <p>Essential information for the provision of a patient's care is not communicated during handover.</p>
Other inadequacies of the healthcare system	<p>Inadequate financial resources.</p> <p>Poor workforce planning.</p> <p>A shortage of staff.</p>		<p>Ineffective communication at shift handover.</p>

	A lack of a distraction-free handover location and interruptions.		Ineffective communication at shift handover.
Other inadequacies of the healthcare system	<p>The absence of guidelines on how handover should be conducted.</p> <p>Doctors are the ultimate decision makers as to whether or not handover takes place.</p> <p>Doctors are the ultimate decision makers as to whether or not to complete handover records.</p> <p>Some doctors do not perceive completing records as their real job, that is, completing records is incongruent with their professional identities.</p> <p>Doctors may have other agendas than the wellbeing of patients e.g. making money.</p> <p>Doctors are not being held responsible for failures to complete handover records.</p>		<p>Out of date records.</p> <p>Incomplete records.</p> <p>Ineffective shift handover communication.</p> <p>Oncoming doctors' (those who start their shift) decisions are based on incomplete information.</p>

Inadequacies of the medical education system	<p>Lack of training in how to communicate effectively during shift handover.</p> <p>Lack of training in what information to include in a handover discussion.</p> <p>A clinical minimum data set (information) to describe various health conditions is not specified at the departmental level.</p> <p>Some doctors lack abilities to elicit essential information for the provision of a patient's care.</p>		<p>Handover records are left incomplete.</p> <p>Essential information for the provision of a patient's care is not communicated during handover.</p> <p>Oncoming doctors' (those who start their shift) decisions may be based on inaccurate or incomplete information.</p> <p>Handover records include a lot of redundant information/t are excessively comprehensive.</p>
Inadequacies of the medical education system	<p>The absence of training in how to communicate effectively.</p> <p>Lack of communication skills/Doctors do not use any communication strategies.</p> <p>Doctors do not provide feedback about information they receive during handover. Doctors do not repeat information received during handover to ensure it has been accurately understood.</p> <p>Doctors do not confirm that they have understood the information communicated during handover.</p> <p>Doctors may become discouraged and withdraw from handover when they feel a discussion is unsatisfactory (e.g. they are not provided with information they expect to receive).</p>		<p>Ineffective communication at shift handover between doctors.</p> <p>Handover may be brief and ineffective if doctors withdraw from a handover discussion.</p>

Problematic social context of handover	<p>Challenging interpersonal, working relationships between doctors.</p> <p>Distrust, poor working relationships between doctors.</p> <p>Some doctors perceive their colleagues as potential whistleblowers.</p> <p>Whether or not to trust colleagues to tell the truth, when they report a patient's medical condition.</p> <p>Unsupportive working environment.</p> <p>Doctors can downplay the acuteness of a patient's medical condition.</p>		<p>Ineffective shift handover communication between doctors.</p> <p>Ineffective shift handover communication between doctors.</p>
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7.4 PLACING THE CURRENT FINDINGS INTO THE PERSPECTIVE OF A HUMAN FACTORS APPROACH

Human factors emerged in response to a blame organisational culture. A blame culture exists in an organisation where errors are attributed to active factors such as the incompetence of staff. When a blame culture prevails in an organisation successful outcomes are expected, against all the odds, such as a difficult work environment (Dekker and Dawsonera, 2011). A human factors approach underpins patient safety. The approach recognises that underperformance and adverse events “*are not the result of negligence or lack of training, but rather occur because of the latent causes within systems*” (WHO, 2005, p. 42). The latent causes of inefficiencies and human error include an organisation’s strategy, culture, climate and their ability to learn from adverse events (WHO 2005). The claim that the context, the work environment, contributes to inefficiencies and human error rather than that the fault which lies with human agency coheres strongly with the theories that have been developed in the present study. For example, contextual factors emerged as negatively affecting doctors’ ability to communicate effectively during handover. A human factors approach, therefore, provides an overall conceptual framework, for interpreting the findings from the present study at a higher level of abstraction. In Table 7.2 the details of the contextual factors that emerged in the present study as affecting doctors’ ability to conduct handover effectively are set within the perspective of a human factors approach.

A human factors approach recognises that in an organisation where a blame culture prevails, as in some hospitals in the Czech Republic, challenges arising from the work context are left unaddressed. The approach promotes, therefore, interventions to improve patient safety which focus on ‘error-producing conditions’ in the work environment (Woods, 2010; WHO, 2005;

Berwick, Calkins, McCannon, Hackbarth, 2006): *“If errors and expertise are both systematically connected to features of people, tools, tasks, and operating environment, then progress on safety comes from understanding and influencing those connections. The rationale is that human error is not an explanation for failure but instead demands an explanation. Effective countermeasures do not start with individual beings who themselves were at the receiving end of much prior trouble...”* (Dekker and Dawsonera, 2011, p. 54).

The reason for investigating the context is to change it and facilitate the performance of individuals. That is, by understanding the latent causes of inefficiencies and adverse events and by changing the context within which people work, we can change mechanisms (e.g. staff behaviour) and consequently, we can influence the outcomes.

Table 7.2 A description of how the contextual factors, the work environment in hospitals in the Czech Republic can negatively affect doctors' ability to communicate effectively during handover.

Contextual factors, which affect the effectiveness of shift handover between doctors in hospitals in the Czech Republic.	How the contextual factors may affect shift handover and communication between doctors placed into the perspective of human factors; and some practice implications.
<p>Inadequacies of the healthcare system.</p> <p>No written guidelines on: (a) how handover should be conducted; (b) how doctors should communicate during handover.</p>	<p>Inefficiencies in healthcare organisations may emerge from active or latent factors (Ross, 2009). Active factors include actions and omissions of individuals, for example, not following the guidelines, lapses (a temporary failure, e.g. a lapse in memory) (Ross, 2009), or human errors (the individual should have behaved differently but s/he didn't).</p> <p>Latent factors are associated with external or internal factors affecting the organisation, which directly or indirectly affect individuals' job performance (Ross, 2009). Examples of latent external factors include regulatory issues which may affect processes and behaviours of individuals within the organisation (Ross, 2009). Examples of latent internal factors include heavy workload, inadequate management, unclear roles and responsibilities or a blame culture.</p> <p>Latent factors may be a trigger for active factors negatively affecting job performance and processes in an organisation. For example, the lack of good management or best practice guidelines may lead to significant differences between individuals' perceptions</p>

of how tasks should be completed, causing misunderstanding, tensions and ineffective performance. In this study, the absence of guidelines on how doctors should communicate during handover was at the core of the problem. The absence of written guidelines on handover represents a systemic, latent source of difficulties and it may illustrate the fact that non-clinical activities such as communication between staff are not the core values of the Czech healthcare system.

The absence of written guidelines on how handover should be conducted seemed to lead doctors to believe that handover is unimportant, meaningless, optional, and, on some occasions, unnecessary. It is unsurprising, therefore, that doctors believe that it is up to them to decide whether or not to conduct handover and how to do it, which, in the absence of relevant regulations, make doctors the ultimate decision makers as to whether or not handover takes place and whether or not to complete handover records. In addition, with no written guidelines, handover becomes a heterogeneous, informal and social practice. Human factors theory posits that informal practices emerge and thrive, as formal practices are inadequate to the local context and situations (Berwick, Calkins, McCannon, Hackbarth, 2006). The results of the present study contribute to the understanding of the mechanisms of emergence informal practices in healthcare organisations in that they may emerge not only as a consequence of some discrepancy between written guidelines and the actual work but also as a consequence of the absence of written guidelines.

Nonetheless, written guidelines tend to impose standardized solutions and hence they could present new problems. While they could be useful in increasing doctors' awareness of the importance of handover and providing them with information about

	<p>steps to be taken during handover, if they are too strict and impossible to be adapted to the daily practice, doctors may ignore them altogether. Previous studies in patient safety revealed the reluctance towards rule-based, standardized approaches amongst doctors, in particular senior ones (Parker and Lawton, 2000). In addition, root causes analyses revealed that doctors in general are less likely than other healthcare practitioners, such as nurses, to report the violation of protocols by their peers (Parker and Lawton, 2000); this can make the evaluation of the usefulness of written handover guidelines challenging. Therefore, while the absence of guidelines on how doctors should communicate during handover represents a systemic problem in the Czech healthcare system, it is still uncertain if the implementation of written guidelines would improve the effectiveness of shift handover communication between doctors.</p> <p>Specific context-related recommendations:</p> <p>The Ministry of Health in the Czech Republic and other relevant parties could engage doctors working in hospitals in the development of shift handover best practice guidelines. The guidelines on how doctors should communicate during handover should reflect the actual daily practice.</p> <p>Prior to the implementation of guidelines awareness raising campaigns could be implemented to raise doctors' awareness of the importance of shift handover communication.</p>
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<p>Inadequacies of the healthcare system: Lack of handover time; shifts do not overlap, heavy workload, and heavy administrative workload.</p>	<p><i>"A clinician can try to focus all he or she wants and be as diligent as possible, but it is not going to change the fact that there are 20 more patients waiting outside, that a physician has not learnt how to respond to an assertive remark about latex allergy... or that there simply is no bed available in postoperative recovery"</i> (Dekker, 2011 p. 19).</p> <p>While healthcare is likely to blame individuals at the sharp end for the system inefficiencies (Dekker and Dawsonera, 2011), the findings from the present study suggest that a difficult context may make it impossible for doctors to complete handover effectively, if at all. Ineffective handover may be linked to doctors' physiological and psychological limitations such as fatigue and cognitive overload, caused, for example, by heavy workload or lack of time (Dekker and Dawsonera, 2011). Contextual factors such as lack of time or heavy workload left unaddressed, further confirm that the context within which doctors should conduct effective handover is challenging.</p> <p>Furthermore, the challenging working environment is likely to negatively affect other components of healthcare delivery. If due to heavy workloads doctors suffer from fatigue, they may find it difficult to concentrate on their work, for example while making a diagnosis or carrying out the treatment.</p> <p>Specific context-related recommendations:</p> <p>Contextual, system limitations, such as heavy workload need to be urgently</p>
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	<p>addressed. Specific handover times should be specified, during which doctors would be released from other duties. Having more time can not only improve the effectiveness of handover but also positively affect the atmosphere in hospital departments and improve working relationships between doctors, i.e. if doctors have more time, they may be willing to engage in handover discussions.</p>
<p>Inadequacies of the medical education system: no training during handover for junior doctors.</p>	<p>Clinical competencies: Human factors recognises the importance of narrative competences, it posits that since human memory is made for stories, and that the ability to tell patients' stories accurately is an important component of health care delivery as an addition to technical skills (Dekker and Dawsonera, 2011). The results of the present study have suggested that the ability to succinctly summarise a patient's case and narrative competencies are more important determinants of handover effectiveness than standardization and the utilization of standardization. Nonetheless, junior doctors did not seem to be provided with adequate support, making them vulnerable and somehow unlikely to skillfully elicit the key information about a patient's medical condition and hence, to conduct handover effectively.</p> <p>Human factors theory posits that individuals' competence should not be seen as a virtue, which is either possessed, or not upon graduation and on entry into a profession. Rather, it should be seen as a collective quality of an organization, system and individuals who work within it (Dekker and Dawsonera, 2011). As such, an organization is directly responsible for professional development and acquisition of</p>

<p>The absence of training in how to communicate effectively.</p> <p>Lack of communication skills/Doctors do not use any communication strategies.</p>	<p>staffs' competence. This shared responsibility for continuous professional development seemed to be absent from the hospitals where the current study was conducted.</p> <p>Specific context-related recommendations:</p> <p>A clinical minimum data (information) to describe various health conditions could be specified at the departmental level to make it easier for junior doctors to prepare handover records. Furthermore, to ensure that handover discussion covers the completion of all tasks and to prevent uneven division of responsibility, doctors could improve handover with the aid of checklists.</p> <p>Non-clinical competencies:</p> <p>Doctors' communication skills or their lack, seen from the perspective of human factors theory, should not be assumed as a skill, which can be acquired automatically, rather, doctors should be encouraged and supported to hone their communication skills.</p> <p>Context-specific recommendations:</p> <p>Training in communication strategies, proven to increase the effectiveness of shift handover communication and information exchange such as providing feedback, repeating received information to ensure it has been accurately understood.</p>
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	<p>Furthermore, the environment within which open communication is encouraged, could improve communication between doctors. The supportive environment could encourage doctors to ask additional questions during handover if they are not provided with information they expect to receive, which could eliminate the occurrences of doctors withdrawing from handover when they feel a discussion is unsatisfactory.</p>
<p>Inadequate communication aids – information technology systems</p> <p>The inadequate implementation of the IT handover systems</p>	<p>Individuals' job performance is distributed across other staff and the available IT systems (Dekker and Dawsonera, 2011). The work context of the Czech Republic doctors includes artefacts, such as IT handover systems. The purpose of the implementation of the IT handover systems is to enhance individuals' job performance (Dekker and Dawsonera, 2011). However, the implementation of IT handover systems in the Czech Republic hospitals led to unanticipated challenges. The human factors approach recognises that advances in technology create a new discipline and that this new discipline needs to be mastered by those using it if it is to improve their work. In addition, the human factors approach recognises unintended consequences of the implementation and use of information technology to support individuals' work. "Take electronic patient records, for instance. They can reproduce all of a patient's laboratory results but may then show all of them without any selectivity... Extracting meaning from what you see on the screen may be even more difficult. This is known as the <i>keyhole effect</i>, it is as if the practitioner is peeping through a keyhole to find the relevant piece of data in the room full of possibilities behind the closed door" (Woods, 2010, p. 86).</p>

	<p>Nevertheless, the greatest obstacle to doctors completing handover records seems to be no policy protecting doctors when they document uncertainty. Furthermore, the human factors approach recognises the role IT systems play in identify formation. The results of the present study have suggested that completing handover records may be incongruent with doctors professional identities, irrespective of whether these records being electronic or not.</p> <p>Specific context-related recommendations:</p> <p>Actions should be taken to ensure that doctors' reluctance towards documenting uncertainty about a patient's clinical condition is eliminated. In addition, other aspects, which need to be addressed, are the law of protection of doctors when they are honest and documents uncertainty, and, developing an atmosphere of openness. These two aspects, the law of protection and an atmosphere of openness require leadership and commitment to change and the whole-system support including the government (changes to legislation), hospital management (advocates for legislative changes and promoters of ongoing commitment to the core values of collaboration, honesty and openness), doctors and other staff working on the floor.</p> <p>It might be that doctors could be encouraged to complete handover records through training or awareness raising events, which promote the importance of information exchange during handover. Doctors should feel that this is in their patients and their own best interest to complete handover records, even if this means that they need to report uncertainty. The IT handover systems in hospitals in the Czech Republic need</p>
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	therefore to be tailored to doctors' needs. Also, a training course in how to optimise the use of IT handover system may be useful in increasing doctors' awareness of updating handover records.
<p>The physical environment of shift handover between doctors.</p> <p>No specific handover place, distractions and interruptions</p>	<p>A noisy, disruptive work environment emerged in the present study as an important barrier to effective shift handover communication. Lack of quiet environment where handover is conducted indicates insufficient system and organisation level support. Nevertheless, creating free from distractions handover environment may not be possible on busy hospital wards.</p> <p>Specific context-related recommendations:</p> <p>Perhaps the hospital management should invest in soundproofed rooms for staff meetings, to enhance the quality of communication between the members of staff.</p>
<p>Problematic social context of handover</p>	<p>Challenging interpersonal, working relationships between doctors, which may decrease the effectiveness of shift handover communication, as suggested by the findings from the present study, seemed to be a symptom of problems deep inside the healthcare system. If a blame culture prevails, there is likely to be an atmosphere of gloom in the hospital and communication between doctors is unlikely to be effective.</p>
Challenging interpersonal, working relationships	The results of the present study contribute to the knowledge about how an

between doctors.

unsupportive work environment may forge distrust and poor working relationships between doctors. For example, to hand over the responsibility for a patient's care to a doctor who is starting a shift, a doctor who was on duty during the previous shift may downplay the acuteness of a patient's medical condition. It is not surprising, therefore, that doctors on some occasions are uncertain as to whether or not to trust colleagues to tell the truth when they report a patient's medical condition. Also, an unsupportive work environment, resulting in poor relationships between doctors, may provide an explanation of why some doctors perceive their colleagues as potential whistle-blowers. While we cannot exclude the potential negative effect of some doctors' 'difficult personalities' on the effectiveness of handover, which were mentioned by the participants of the present study, an unsupportive work environment is likely to play a significant role in decreasing the effectiveness of handover.

Paradoxically, doctors' position in the two hospitals where the present study was said by non-medical staff to be very strong. What does it mean in practice? And how does it relate to making efforts to improve the effectiveness of communication between doctors at shift handover? This may mean that any interventions and programmes, which aim to enhance communication between doctors at shift handover, may need to address the multidimensional nature of handover communication and, most importantly, doctors need to thoroughly approve of them. If doctors are not on the boards, this would mean that any efforts were a waste of time and resources.

Specific context-related recommendations:

Strong leadership is required in hospitals in the Czech Republic that creates and nurtures trusting and open doctors work relationships.

7.5 QUALITY AND LIMITATIONS OF THE STUDY

7.5.1 THE QUALITY OF A MIXED-METHODS STUDY

A key issue to be considered in scientific research is the notions of reliability and validity (Kirk and Miller, 1986), both of which are concerned with the quality and sustainability of the findings (Kirk and Miller 1986). 'Validity, from a realist perspective, is not a matter of procedures, but of the relationship between the claim and the phenomena that the claim is about' (Maxwell and Mittapalli, 2010, p.158). Validity in the realist approach is represented by 'a valid description, explanations, or interpretations of the phenomenon about which the claim is made' (Maxwell and Mittapalli, 2010, p.159).

Strategies aiming to enhance internal validity of the research can be applied throughout the entire research process (LeCompte and Goetz, 1982). The researcher has incorporated three measures to deal with the **validity** of research findings: (1) prolonged involvement in the field: "that enhances the researcher's capacity to match investigation categories with participants' reality" (Kirk and Miller, 1986); (2) conducting research in a genuine setting: "thus the task of revealing 'reality of a life experience' can be accomplished"; (3) researcher's self-monitoring during the research process. We will briefly consider them below:

1. Prolonged involvement in the field: the researcher made an attempt to spend as much time as possible at the research sites. In total, over a period of four months, she spent approximately a couple of weeks at each hospital (Site 1 and 2).

2. Conducting research in a genuine setting: the present study was carried out in two hospitals. To ensure that the collected data represented the genuine features of both the process of handover and context within which it

took place, the researcher conducted informal observations of handover sessions. In spite of the observations being an informal element of data collection, they seemed to be invaluable in gaining an understanding of how handover 'operated' in 'reality'.

3. Researchers' self-monitoring during the research process: the researcher kept the diary and recorded her experiences and perceptions of, the research process, handover and her attitudes towards the study participants.

To enhance the "**trustworthiness**" of Phase III the researcher saw to satisfy four criteria: "credibility", "transferability" (Hammersley, 1992; Robson, 2002), "confirmability" and "dependability" (Lincoln and Guba, 1985).

TRUSTWORTHINESS

CREDIBILITY

Credibility refers to the extent to which the results of the study represent a true representation of the phenomenon. In the present study, the researcher addressed credibility in the following ways: (i) The data analysis process was enhanced by seeking the opinion of the third parties, including academic supervisors, peers, and a clinical professor working in a hospital in the Czech Republic. Feedback from the clinical professor was particularly important as it provided an insight into how well the researcher's interpretations of the findings represented the 'reality' of shift handover communication between doctors in hospitals in the Czech Republic (dependability); (ii) Furthermore, the researcher included peer debriefing in the study. That is, two qualitative researchers external to the supervisory panel extrapolated themes and categories from two transcripts. This provided an invaluable opportunity to assess emerging categories from the data.

TRANSFERABILITY

Transferability is concerned with whether or not the outcomes of the study can be applied to other settings (Lewis and Ritchie, 2009). To enhance transferability and make this assessment easier the researcher provided a detailed account of the study setting, sample, data collection and analysis process (Lewis and Ritchie, 2009). In addition, the present study was guided by critical realism, and as such it acknowledges that 'generalization only gestures towards the explanatory work, which begins when a mechanism generating a tendency has been located and tested (Collier 1994, p.67); also, that a generalization, should indicate 'where we might look for its explanations' (Collier, 1994, p.67). A new theoretical proposition developed during the current study meant to represent the real factors (apparatus), which generate ineffective shift handover communication between doctors. Transferability can also be enhanced by purposive sampling, however, in the present study purposive approach to sampling was limited as the participants recruitment was complemented by snowball sampling, which decreased the generalisability of the findings from Phase III.

CONFIRMABILITY

Confirmability is concerned with the extent to which others can confirm the results of the study as valid. In the present study, confirmability was addressed by using direct quotations to illustrate the interviewees' experiences and perceptions (Ritchie et al., 2003).

DEPENDABILITY

Dependability refers to the extent to which the results of the study are consistent and could be repeated by other researchers (Lincoln and Guba,

1985). To enhance the dependability of the present study the researcher described the research process, including all stages of data collection.

REFLEXIVITY

GAINING ACCESS TO THE SAMPLE

A great deal of effort had been made to establish and maintain good relationships with gatekeepers. To achieve this, the researcher was in regular email and telephone contact with the clinical director (Site 1) and the quality manager (Site 2). The researcher visited the sites a few times and got involved in different patient safety initiatives. For example, she helped to prepare a press release on falls prevention (Site 1). On reflection, good relationships with gatekeepers affected the current project in a positive way as they allow the research to spend time with doctors and hospital managers, discussing and observing shift handover sessions. Those visits to hospitals enhanced “the researcher’s capacity to match investigation categories with participant’s reality” (Kirk and Miller, 1986).

CHOOSING RESEARCH METHODS AND DECIDING UPON THE RESEARCH TOPIC

Investigating patient safety in the Czech Republic required multiple methods, driven by theory and pragmatism, as it may prove sensitive in healthcare organisations where a blame culture prevails. A blame culture is predicated on the assumption that errors are attributable to individuals and is likely to exist in healthcare organisations, which are endeavouring to improve patient safety (Khatri, Brown, Hicks, 2009). Consequently, while formal observations of handover sessions could provide an invaluable insight into the practice, doctors could be reticent about participating in such a research study. In order to overcome this obstacle, the study focused on exploring

doctors' perceptions and experiences. Second, heavy workloads may prevent doctors from participating in research if research is time-consuming. To overcome this issue, doctors were informed that participation in Phase I did not oblige them to participate in Phase II.

DATA COLLECTION

The present study provided an invaluable opportunity for the researcher to hone/improve her interviewing skills. Although the researcher conducted interviews in the past, she gained a lot from interviewing doctors. During the first few interviews the researcher found probing for further answers challenging and felt somehow intimidated. However, over the course of interviews, she gained more confidence and probing became easier.

The present study has several limitations, which are outlined below:

PHASE I:

The quality of some of the studies included in the critical review of literature, the first theory testing cycle of the present study, which provided the data for the development of the questionnaire, was poor. This in turn could have compromised the quality of the questionnaire. It was considered impractical to contact the key authors to see if they were aware of any relevant studies not identified by the researcher.

PHASE II:

The questionnaire phase had limitations. First, this was an exploratory study and the participants' views may not be representative of a wider population of clinicians working in hospitals in the Czech Republic. Therefore, the results must be interpreted with caution. Secondly, the questionnaire was an

explanatory tool used to assess participants' agreement with a wide range of barriers to handover drawn from the literature. Further studies will be required to develop a reliable tool for measuring barriers to handover across multiple sites. Thirdly, it was considered impractical and inappropriate to use a stratified sampling approach due to the necessity to ensure anonymity and confidentiality of study participants. Fourthly, twelve doctors (6%) did not provide the length of their work experience, which may suggest that, although efforts have been made to explain the ethical principles of the research process, respondents did not feel confident that their anonymity would be protected. The findings are susceptible to hindsight bias owing to doctors expressing their perceptions based on recollected and reconstructed handover events that had taken place in the past.

PHASE III:

The initial purposive sampling approach used in the study was supplemented by snowball sampling and doctors could recruit the new participants from amongst their colleagues who have similar opinions to them. This in turn could have compromised the generalisability of the findings. In addition, as with Phase II, the findings are susceptible to hindsight bias owing to doctors expressing their perceptions based on recollected and reconstructed handover events that had taken place in the past.

In addition, limitations arising from the elements of methodology were highlighted in Section 3.5.1 (Chapter 3).

7.6 CONCLUSIONS, RECOMMENDATIONS FOR SHIFT HANDOVER PRACTICES, PATIENT SAFETY POLICIES AND FUTURE RESEARCH

The results of the present study have revealed that similar barriers to effective shift handover communication between doctors identified in

hospitals around the world are identified by doctors working in hospitals in the Czech Republic. Furthermore, the theory testing phases of the present study have revealed that the social, systemic and environmental features that make up different contexts in which handover is conducted collectively contribute to ineffective shift handover communication. Consequently, the division of barriers to handover into various one-dimensional categories such as the individual performance, the system or the social environment, is superficial as it does not adequately describe the reality of the context and process of handover communication.

A key finding from the present study is that handover is, to a significant extent, informal, social and governed by doctors. Therefore, handover communication has emerged as inherently embedded in complex social relationships between doctors and the blame culture of the Czech Republic hospitals. This might be caused by a difficult work environment including the absence of policies or guidelines on how doctors should communicate during handover.

Recommendations for how the effectiveness of shift handover communication between doctors could be improved are presented below.

The findings from the present study indicate that changes to shift handover practices require combined efforts at all levels of the healthcare system. For example, one of the findings from the present study is that doctors have different perceptions of the importance and role(s) of handover, most likely due to the absence of training and guidelines on handover form(s) and content(s). This finding illustrates the urgent need to: (a) define shift handover at the system and departmental level, and (b) raise practitioners' awareness of its importance. The handover definition would need to specify the meaning, role(s), and possible long and short term benefits of effective handovers as well as consequences of ineffective handovers or absent. The

definition of handover could be displayed in a visible place in staff rooms in each hospital department so that doctors and hospital managers could refer to them whenever necessary.

Furthermore, the improvement of effectiveness of shift handover communication requires the development of: (i) handover curricula to be incorporated in medical education; (ii) good handover practice guidelines; (iii) semi-structured handover templates at the departmental level to make it easier for doctors to elicit essential information to be documented in handover records and to be communicated at handover; and, (iv) guidelines for junior doctors on disease-specific essential information requirements to make it easier for them to develop the 'story' for doctors who start their shift, that includes information about a patient's diagnosis and a treatment plan, and any work that needs to be done during the next shift. Additionally, doctors could adopt a model, which would enhance their ability to collate essential information prior to a handover meeting such as an Information Push Model. The Information Push Model orders pre-handover activities to make it easy for doctors to collect relevant information to be included in a handover discussion (Abraham et al., 2011). Such a model would likely enhance junior doctors' abilities to elicit essential information to be transferred during a handover discussion.

Turning to handover guidelines, there are a number of ways these could be adapted that would be worth testing. These could include separate sections for those who seek to improve handover practices, e.g. for junior and senior doctors (National Patient Safety Agency and BMJ, 2004) as their role at handover may vary. Also, handover guidelines should include sections with useful information for hospital managers, so they can create an environment, which enhances the effectiveness of shift handover communication.

With regard to the role of hospital managers in improving handover practices, they may need to come up with 'out of the box' solutions to make the real change. For example, to ensure doctors' engagement and ownerships of handover improvement programmes, managers need to build commitment to a common purpose. Managers could also facilitate doctors' involvement through training handover improvement champions. Handover champions would have to be recognised as established 'role models' for other doctors and they should have sufficient authority to make the change. The champions could encourage honest discussions about all work carried out by doctors as nurturing honest communication seems important for effective handover. Indeed, the results of the present study have revealed that distrust and poor working relationships between colleagues are significant barriers to effective handover, including completing handover records.

Furthermore, hospital managers could ensure changes to shift patterns, so that it is possible for doctors to conduct shift handover and so that senior doctors could have enough time to support/teach junior doctors, without the necessity of doctors who were on duty during the previous shift to wait until the next shift begins or for their colleagues to arrive early.

In addition, since social relationships and the hierarchy emerged in the present study as barriers to handover, the utilisation of communication strategy should be encouraged. Changing hospital culture might be the most optimal, yet, the most challenging way of enhancing working relationships between doctors and the quality of shift handover communication. To change hospital culture into that which prioritises Patient Safety, hospital managers could utilise a change management process such as the Six Sigma (Chassin and Loeb, 2011). The purpose of the implementation of the Six Sigma process is to change practitioners' behaviour (in the short term), and to change an organisational culture (in a long term).

What's more, doctors could be encouraged to complete a training in communication strategies and be encouraged to communicate at handover face-to-face with the aid of patients' record, as this method of handover communication has been identified as the most effective one (Lardner, 1996). In addition, training courses for doctors on how to conduct handover could be developed. For example, simulation may be a useful teaching strategy for handover as it would allow medical students to narrate patients' stories in 'a busy hospital environment'.

In addition, the results of the present study have revealed that many contextual, latent causes within the Czech Republic healthcare system negatively affect the effectiveness of shift handover communication between doctors. Potential countermeasures against latent causes of ineffective shift handover communication such as an unsupportive work environment need to be based on changes in the Czech Republic healthcare and hospital systems. System-related solutions to addressing inefficiencies in shift handover and other processes taking place within Czech Hospitals are likely to be more effective than solutions focusing on improving doctors' 'handover-related' behavior, without addressing problems arising from the context in which handover is conducted.

Finally, handover measures could be developed at the hospital/department level. These measures would need to be practical and easy to use, so those doctors who do not consider handover as an important process could adopt them. The purpose of such measures would be to enhance doctors' awareness of the importance of handover and to be able to monitor handover performance.

In addition, the Ministry of Health in the Czech Republic could develop system-level solutions for encouraging doctors to complete handover records, and to report adverse events.

Future studies could:

- Evaluate the use of handover records and explore the extent of information overlap between handover records and other medical documentation.
- Investigate the consistency between a patient's treatment, information exchanged (i) verbally during handover and (ii) documented in patient records.
- Evaluate what sources of information doctors use to complete handover records.
- Evaluate steps taken at the department, hospital, and national level to ensure that doctors document work carried out during the previous shift, especially what could be done to encourage documenting clinical uncertainty and adverse events

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APPENDICES

Appendix 4.1

The preliminary and full search strategies

The preliminary search strategy

Medline search strategy

S1 (MH "Communication+")

S2 TI communicat* or AB communicat*

S3 S1 or S2

S4 (MH "Hospitals+")

S5 TI hospital* or AB hospital*

S6 TI department* or AB department*

S7 S4 or S5 or S6

S8 S3 and S7

S9 TI (handover* or hand-over* or "hand over*") or AB (handover* or hand-over* or "hand over*")

S10 TI (handoff* or hand-off* or "hand off*") or AB (handoff* or hand-off* or "hand off*")

S11 TI "shift change*" or AB "shift change*"

S12 TI "shift to shift" or AB "shift to shift"

S13 TI ("sign off*" or signoff* or sign-off*) or AB ("sign off*" or signoff* or sign-off*)

S14 TI (sign-out* or signout*) or AB (sign-out* or signout*)

S15 TI (signover* or sign-over*) or AB (signover* or sign-over*)

S16 TI "end of shift" or AB "end of shift"

S17 TI "roster change*" or AB "roster change*"

S18 TI "shift briefing*" or AB "shift briefing*"

S19 TI "patient transfer*" or AB "patient transfer"

S20 S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19

S21 S8 and S20 Limiters - Date of Publication from: 20090101-

Scopus search strategy

Generic:

((((TITLE-ABS-KEY(communicat*)) and (((TITLE-ABS-KEY(handover or hand-over or "hand over")) or (TITLE-ABS-KEY("shift change")) or (TITLE-ABS-KEY("shift to shift")) or (TITLE-ABS-KEY("sign off" or signoff or sign-off)) or (TITLE-ABS-KEY(sign-out or signout)) or (TITLE-ABS-KEY(signover or sign-over)) or (TITLE-ABS-KEY("end of shift")) or ((TITLE-ABS-KEY("roster change")) or (TITLE-ABS-KEY("shift briefing")) or (TITLE-ABS-KEY("inter-professional transfer")) or (TITLE-ABS-KEY("inter-departmental transfer")) or (TITLE-ABS-KEY("patient transfer"))))) and not ((TITLE-ABS-KEY(network)) or (TITLE-ABS-KEY(cellular)) or (TITLE-ABS-KEY("mobile communication")) or (TITLE-ABS-KEY(vehicular w/5 network)))) AND (pubyear aft 2000)

PsycINFO search strategy

Search Query #13 (TI=communicat* or AB=com) and((TI=(handover* or hand-over* or "hand over*") or AB=(handover* or hand-over* or "hand over*")) or(TI=(handoff* or hand-off* or "hand off*") or AB=(handoff* or hand-off* or "hand off*")) or(TI=("shift change*") or AB=("shift change*")) or(TI=("shift to shift") or AB=("shift to shift")) or(TI=("sign off*" or signoff* or sign-off*) or AB=("sign off*" or signoff* or sign-off*)) or(TI=(sign-out* or signout*) or AB=(sign-out* or signout*)) or(TI=(signover* or sign-over*) or AB=(signover* or sign-over*)) or(TI=("end of shift") or AB=("end of shift")) or(TI=("roster change*") or AB=("roster change*")) or(TI=("shift briefing*") or AB=("shift briefing*"))).

The full search strategy

Medline/CINAHL search strategy

#	Query	Results
S1	TI (handover* or hand-over* or "hand over*") OR AB (handover* or hand-over* or "hand over*")	1211
S2	TI (handoff* or hand-off* or "hand off*") OR AB (handoff* or hand-off* or "hand off*")	742
S3	TI shift n3 change* OR AB shift n3 change*	2889
S4	TI ("sign off*" or "signoff*" or sign-off*) OR AB ("sign off*" or "signoff*" or sign-off*)	62
S5	TI (sign-out* or signout*) OR AB (sign-out* or signout*)	227
S6	TI (signover* or sign-over*) OR AB (signover* or sign-over*)	49
S7	TI "end of shift" OR AB "end of shift"	950
S8	TI "roster change*" OR AB "roster change*"	7
S9	TI "medical transfer*" OR AB "medical transfer*"	1
S10	TI information n3 transfer* OR AB information n3 transfer*	4871
S11	S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10	10234
S12	(MH "Communication Barriers")	6701
S13	TI barrier* n3 communicat* OR AB barrier* n3 communicat*	1264
S14	TI breakdown* n3 communicat* OR AB breakdown* n3 communicat*	433

Appendices

S15	TI obstruct* n3 communicat* OR AB obstruct* n3 communicat*	152
S16	TI negative* n5 communicat* OR AB negative* n5 communicat*	736
S17	TI adverse* n5 communicat* OR AB adverse* n5 communicat*	222
S18	TI problem* n5 communicat* OR AB problem* n5 communicat*	4335
S19	TI "poor communicat*" OR AB "poor communicat**"	991
S20	TI obstacle* n3 communicat* OR AB obstacle* n3 communicat*	87
S21	TI fail* n3 communicat* OR AB fail* n3 communicat*	900
S22	TI inadequat* n5 communicat* OR AB inadequat* n5 communicat*	514
S23	S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22	15331
S24	S11 and S23	66
S25	TI doctor* OR AB doctor*	8253
S26	TI physician* OR AB physician*	13620
S27	S26 or S27	6589
S27	S24 and S27	128

ID Search

Hits Edit Delete

Appendices

#1	<u>(handover* or hand-over* or "hand over" or "hand overs"):ti or (handover* or hand-over* or "hand over" or "hand overs"):ab</u>	30	edit	delete
#2	<u>(handoff* or hand-off* or "hand off" or "hand offs"):ti or (handoff* or hand-off* or "hand off" or "hand offs"):ab</u>	31	edit	delete
#3	<u>(shift near/3 change*):ti or (shift near/3 change*):ab</u>	49	edit	delete
#4	<u>"sign off" or "sign offs" or signoff* or sign-off*:ti or "sign off" or "sign offs" or signoff* or sign-off*:ab</u>	5	edit	delete
#5	<u>(sign-out* or signout*):ti or (sign-out* or signout*):ab</u>	7	edit	delete
#6	<u>(signover* or sign-over*):ti or (signover* or sign-over*):ab</u>	8	edit	delete
#7	<u>"end of shift":ti or "end of shift":ab</u>	5	edit	delete
#8	<u>"roster change" or "roster changes":ti or "roster change" or "roster changes":ab</u>	0	edit	delete
#9	<u>"medical transfer" or "medical transfers":ti or "medican transfer" or "medical transfers":ab</u>	0	edit	delete
#10	<u>(information near/3 transfer*):ti or (information near/3 transfer*):ab</u>	70	edit	delete
#11	<u>(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10)</u>	204	edit	delete

#12	<u>(barrier* near/5 communicat*):ti or (barrier* near/5 communicat*):ab</u>	28	edit	delete
#13	<u>(breakdown* near/3 communicat*):ti or (breakdown* near/3 communicat*):ab</u>	2	edit	delete
#14	<u>(obstruct* near/3 communicat*):ti or (obstruct* near/3 communicat*):ab</u>	2	edit	delete
#15	<u>(negative* near/5 communicat*):ti or (negative* near/5 communicat*):ab</u>	30	edit	delete
#16	<u>(adverse* near/5 communicat*):ti or (adverse* near/5 communicat*):ab</u>	12	edit	delete
#17	<u>(problem* near/5 communicat*):ti or (problem* near/5 communicat*):ab</u>	145	edit	delete
#18	<u>"poor communication" or "poor communications":ti or "poor communication" or "poor communications":ab</u>	21	edit	delete
#19	<u>(obstacle* near/3 communicat*):ti or (obstacle* near/3 communicat*):ab</u>	0	edit	delete
#20	<u>(fail* near/3 communicat*):ti or (fail* near/3 communicat*):ab</u>	10	edit	delete
#21	<u>(inadequate near/5 communicat*):ti or (inadequate near/5 communicat*):ab</u>	6	edit	delete
#22	<u>MeSH descriptor Communication Barriers explode all trees</u>	65	edit	delete
#23	<u>(#12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22)</u>	298	edit	delete

#24 <u>(#11 AND #23)</u>	0	edit	delete
#25 <u>(doctor*): ti or (doctor*):ab</u>	240	edit	delete
#26 <u>(physician*) :ti or (physician*)</u>	215	edit	delete
#27 <u>(#25 OR #26)</u>	420	edit	delete
#28 <u>(#24 OR #27)</u>	86	edit	delete

Web of Knowledge search strategy

Search Strategy

# 31	<u>Approximately</u> <u>97</u>	#30 AND #23
# 30	<u>Approximately</u> <u>2,109,008</u>	#29 OR #28 OR #27 OR #26 OR #25 OR #24
# 29	<u>Approximately</u> <u>7,184</u>	Title=("doctor communication" or "doctor communications") OR Topic=("doctor communication" or "doctor communications")
# 28	<u>58</u>	Title=("physician communication" or "physician communications") OR Topic=("physician communication" or "physician communications")
# 27	<u>761</u>	Title=("medical team" or "medical teams") OR Topic=("medical team" or "medical teams")
# 26	<u>936</u>	Title=("healthcare team" or "healthcare teams") OR Topic=("healthcare team" or "healthcare teams")
# 25	<u>Approximately</u> <u>65,669</u>	Title=((doctor* or physician*)) OR Topic=((doctor* or physician*) and)
# 24	<u>Approximately</u> <u>2,062,343</u>	Title=(hospital* or ward*) OR Topic=(hospital* or ward*)

# 23	<u>Approximately</u> <u>297</u>	#22 AND #11
# 22	<u>Approximately</u> <u>30,629</u>	#21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12
# 21	<u>2,075</u>	Title=(fail* near/3 communicat*) OR Topic=(fail* near/3 communicat*)
# 20	<u>243</u>	Title=(obstacle* near/3 communicat*) OR Topic=(obstacle* near/3 communicat*)
# 19	<u>995</u>	Title=("poor communication" or "poor communicator" or "poor communicators" or "poor communications") OR Topic=("poor communication" or "poor communicator" or "poor communicators" or "poor communications")
# 18	<u>506</u>	Title=(inadequate near/5 communicat*) OR Topic=(inadequate near/5 communicat*)
# 17	<u>Approximately</u> <u>14,826</u>	Title=(problem* near/5 communicat*) OR Topic=(problem* near/5 communicat*)
# 16	<u>442</u>	Title=(adverse* near/5 communicat*) OR Topic=(adverse* near/5 communicat*)
# 15	<u>1,382</u>	Title=(negative* near/5 communicat*) OR Topic=(negative* near/5 communicat*)
# 14	<u>240</u>	Title=(obstruct* near/3 communicat*) OR

Appendices

Topic=(obstruct* near/3 communicat*)

- # 13 525 Title=(breakdown* near/3 communicat*)
OR Topic=(breakdown* near/3
communicat*)
- # 12 Approximately Title=(barrier* near/5 communicat*) OR
6,984 Topic=(barrier* near/5 communicat*)
- # 11 Approximately #10 OR #9 OR #8 OR #7 OR #6 OR #5
60.935 OR #4 OR #3 OR #2 OR #1
- # 10 Approximately Title=(information near/3 transfer*) OR
22,468 Topic=(information near/3 transfer*)
- # 9 3 Title=("medical transfer" or "medical
transfers") OR Topic=("medical transfer"
or "medical transfers")
- # 8 9 Title=("roster change" or "roster changes")
OR Topic=("roster change" or "roster
changes")
- # 7 167 Title=("end of shift") OR Topic=("end of
shift")
- # 6 314 Title=(signover* or sign-over*) OR
Topic=(signover* or sign-over*)
- # 5 453 Title=(sign-out* or signout*) OR

Topic=(sign-out* or signout*)

- # 4 317 Title=("sign off" or "sign offs" or signoff* or
sign-off*) OR Topic=("sign off" or "sign
offs" or signoff* or sign-off*)
- # 3 Approximately Title=(shift near/3 change*) OR
21.720 Topic=(shift near/3 change*)
- # 2 Approximately Title=(handoff* or hand-off* or "hand off"
7.041 or "hand offs") OR Topic=(handoff* or
hand-off* or "hand off" or "hand offs")
- # 1 Approximately Title=(handover* or hand-over* or "hand
8.067 over" or "hand overs") OR
Topic=(handover* or hand-over* or "hand
over" or "hand overs")

PsycINFO search strategy

#38 Search Query #38 (((TI=(handover* or hand-over* or "hand over*") or AB=(handover* or hand-over* or "hand over*")) or(TI=(handoff* or hand-off* or "hand off*") or AB=(handoff* or hand-off* or "hand off*")) or(TI=(shift within 3 change*) or AB=(shift within 3 change*)) or(TI=("sign off*" or signoff* or sign-off*) or AB=("sign off*" or signoff* or sign-off*)) or(TI=(sign-out* or signout*) or AB=(sign-out* or signout*)) or(TI=(signover* or sign-over*) or AB=(signover* or sign-over*)) or(TI=("end of shift") or AB=("end of shift")) or(TI=("roster change*") or AB=("roster change*")) oror((information within 3 transfer*) or (information within 3 transfer*)) and((TI=(barrier* within 5 communicat*) or AB=(barrier* within 5 communicat*)) or(TI=(breakdown* within 3 communicat*) or AB=(breakdown* within 3 communicat*)) or(TI=(obstruct* within 3 communicat*) or AB=(obstruct* within 3 communicat*)) or(TI=(negative* within 5 communicat*) or AB=(negative* within 5 communicat*)) or(TI=(adverse* within 5 communicat*) or AB=(adverse* within 5 communicat*)) or(TI=(problem* within 5 communicat*) or AB=(problem* within 5 communicat*)) or(TI=("poor communicat*") or AB=("poor communicat*")) or(TI=(fail* within 3 communicat*) or AB=(fail* within 3 communicat*)) or(TI=(inadequate within 5

communicat*) or AB=(inadequate within 5 communicat*)) or(DE="communication barriers") or(TI=(obstacle* within 3 communicat*) or AB=(obstacle* within 3 communicat*))) and((DE=("hospitals" or "psychiatric hospitals" or "sanatoriums")) or(TI=(hospital* or ward) or AB=(hospital* or ward)) or(TI=((doctor* or physician*)) 11 Published Works results found in PsycINFO

#37 Search Query #37 (DE=("hospitals" or "psychiatric hospitals" or "sanatoriums")) or(TI=(hospital* or ward) or AB=(hospital* or ward)) or(TI=((doctor* or physician*)) or AB=((doctor* or physician*)) (Copy Query) 103479 Published Works results found in PsycINFO

#32 Search Query #32 TI=((doctor* or physician*)) or AB=((doctor* or physician*)) (Copy Query) 5947 Published Works results found in PsycINFO

#31 Search Query #31 TI=(hospital* or ward) or AB=(hospital* or ward) (Copy Query) 97024 Published Works results found in PsycINFO

#30 Search Query #30 DE=("hospitals" or "psychiatric hospitals" or "sanatoriums") (Copy Query) 13481 Published Works results found in PsycINFO

#29 Search Query #29 ((TI=(handover* or hand-over* or "hand over*") or AB=(handover* or hand-over* or "hand over*")) or(TI=(handoff* or hand-off* or "hand off*") or AB=(handoff* or hand-off* or "hand off*")) or(TI=(shift within 3 change*) or AB=(shift within 3 change*)) or(TI=("sign off*" or signoff* or sign-off*) or AB=("sign off*" or signoff* or sign-off*)) or(TI=(sign-out* or signout*) or AB=(sign-out* or signout*)) or(TI=(signover* or sign-over*) or AB=(signover* or sign-over*)) or(TI=("end of shift") or AB=("end of shift")) or(TI=("roster change*") or AB=("roster change*")) or((information within 3 transfer*) or (information within 3 transfer*)) and((TI=(barrier* within 5 communicat*) or AB=(barrier* within 5 communicat*)) or(TI=(breakdown* within 3 communicat*) or AB=(breakdown* within 3 communicat*)) or(TI=(obstruct* within 3 communicat*) or AB=(obstruct* within 3 communicat*)) or(TI=(negative* within 5 communicat*) or AB=(negative* within 5 communicat*)) or(TI=(adverse* within 5 communicat*) or AB=(adverse* within 5 communicat*)) or(TI=(problem* within 5 communicat*) or AB=(problem* within 5 communicat*)) or(TI=("poor communicat*") or AB=("poor communicat*")) or(TI=(fail* within 3 communicat*) or AB=(fail* within 3 communicat*)) or(TI=(inadequate within 5 communicat*) or AB=(inadequate within 5 communicat*)) or(DE="communication barriers") or(TI=(obstacle* within 3 communicat*) or AB=(obstacle* within 3 communicat*))) (Copy Query) 40 Published Works results found in PsycINFO

#28 Search Query #28 (TI=(barrier* within 5 communicat*) or AB=(barrier* within 5 communicat*)) or(TI=(breakdown* within 3 communicat*) or AB=(breakdown* within 3 communicat*)) or(TI=(obstruct* within 3 communicat*) or AB=(obstruct* within 3 communicat*)) or(TI=(negative* within 5 communicat*) or AB=(negative* within 5 communicat*)) or(TI=(adverse* within 5 communicat*) or AB=(adverse* within 5 communicat*)) or(TI=(problem* within 5 communicat*) or AB=(problem* within 5 communicat*)) or(TI=("poor communicat*") or AB=("poor communicat*")) or(TI=(fail* within 3

communicat*) or AB=(fail* within 3 communicat*)) or(TI=(inadequate within 5 communicat*) or AB=(inadequate within 5 communicat*)) or(DE="communication barriers") or(TI=(obstacle* within 3 communicat*) or AB=(obstacle* within 3 communicat*)) (Copy Query) 6794 Published Works results found in PsycINFO

#27 Search Query #27 TI=(obstacle* within 3 communicat*) or AB=(obstacle* within 3 communicat*) (Copy Query) 74 Published Works results found in PsycINFO

[#26 deleted - error]

#25 Search Query #25 DE="communication barriers" (Copy Query) 261 Published Works results found in PsycINFO

#24 Search Query #24 TI=(inadequate within 5 communicat*) or AB=(inadequate within 5 communicat*) (Copy Query) 194 Published Works results found in PsycINFO

#23 Search Query #23 TI=(fail* within 3 communicat*) or AB=(fail* within 3 communicat*) (Copy Query) 470 Published Works results found in PsycINFO

[##22 deleted - error]

#21 Search Query #21 TI=("poor communicat*") or AB=("poor communicat*") (Copy Query) 372 Published Works results found in PsycINFO

#20 Search Query #20 TI=(problem* within 5 communicat*) or AB=(problem* within 5 communicat*) (Copy Query) 3884 Published Works results found in PsycINFO

#19 Search Query #19 TI=(adverse* within 5 communicat*) or AB=(adverse* within 5 communicat*) (Copy Query) 62 Published Works results found in PsycINFO

#18 Search Query #18 TI=(negative* within 5 communicat*) or AB=(negative* within 5 communicat*) (Copy Query) 914 Published Works results found in PsycINFO

#17 Search Query #17 TI=(obstruct* within 3 communicat*) or AB=(obstruct* within 3 communicat*) (Copy Query) 13 Published Works results found in PsycINFO

#16 Search Query #16 TI=(breakdown* within 3 communicat*) or AB=(breakdown* within 3 communicat*) (Copy Query) 264 Published Works results found in PsycINFO

#15 Search Query #15 TI=(barrier* within 5 communicat*) or AB=(barrier* within 5 communicat*) (Copy Query) 730 Published Works results found in PsycINFO

#14 Search Query #14 (TI=(handover* or hand-over* or "hand over*") or AB=(handover* or hand-over* or "hand over*")) or (TI=(handoff* or hand-off* or "hand off*") or AB=(handoff* or hand-off* or "hand off*")) or (TI=(shift within 3 change*) or AB=(shift within 3 change*)) or (TI=("sign off*" or signoff* or sign-off*) or AB=("sign off*" or signoff* or sign-off*)) or (TI=(sign-out* or signout*) or AB=(sign-out* or signout*)) or (TI=(signover* or sign-over*) or AB=(signover* or sign-over*)) or (TI=("end of shift") or AB=("end of shift")) or (TI=("roster change*") or AB=("roster change*")) or ((information within 3 transfer*) or (information within 3 transfer*)) (Copy Query) 5551 Published Works results found in PsycINFO

#13 Search Query #13 (information within 3 transfer*) or (information within 3 transfer*) (Copy Query) 4893 Published Works results found in PsycINFO

Date Range: Earliest to 2012

#11 Search Query #11 TI=("roster change*") or AB=("roster change*") (Copy Query) 3 Published Works results found in PsycINFO

#10 Search Query #10 TI=("end of shift") or AB=("end of shift") (Copy Query) 8 Published Works results found in PsycINFO

#9 Search Query #9 TI=(signover* or sign-over*) or AB=(signover* or sign-over*) (Copy Query) 6 Published Works results found in PsycINFO

#8 Search Query #8 TI=(sign-out* or signout*) or AB=(sign-out* or signout*) (Copy Query) 25 Published Works results found in PsycINFO

#7 Search Query #7 TI=("sign off*" or signoff* or sign-off*) or AB=("sign off*" or signoff* or sign-off*) (Copy Query) 8 Published Works results found in PsycINFO

#6 Search Query #6 TI=(shift within 3 change*) or AB=(shift within 3 change*) (Copy Query) 368 Published Works results found in PsycINFO

#5 Search Query #5 TI=(handoff* or hand-off* or "hand off*") or AB=(handoff* or hand-off* or "hand off*") (Copy Query) 79 Published Works results found in PsycINFO

[#2 - #4 deleted, not used]

#1 Search Query #1 TI=(handover* or hand-over* or "hand over*") or AB=(handover* or hand-over* or "hand over*") (Copy Query) 187 Published Works results found in PsycINFO

Scopus search

Search Results Actions

37 (((((TITLE(handover* OR hand-over* OR (hand PRE/0 over*)) OR ABS(handover* OR hand-over* OR (hand PRE/0 over*)))) OR ((TITLE(handoff* OR hand-off* OR (hand PRE/0 off*)) OR ABS(handoff* OR hand-off* OR (hand PRE/0 off*)))) OR ((TITLE(shift W/3 change*) OR ABS(shift W/3 change*)) OR ((TITLE((sign PRE/0 off*) OR signoff* OR sign-off*) OR ABS((sign PRE/0 off*) OR signoff* OR sign-off*))) OR ((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) OR (((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) OR ((TITLE("end of shift") OR ABS("end of shift"))) OR ((TITLE(roster PRE/0 change*) OR ABS(roster PRE/0 change*)) OR ((TITLE(information W/3 transfer*) OR ABS(information W/3 transfer*)))) AND (((TITLE(barrier* W/5 communicat*) OR ABS(barrier* W/5 communicat*)) OR ((TITLE(breakdown* W/3 communicat*) OR ABS(breakdown* W/3 communicat*)) OR ((TITLE(obstruct* W/3 communicat*) OR ABS(obstruct* W/3 communicat*)) OR ((TITLE(negative* W/5 communicat*) OR ABS(negative* W/5 communicat*)) OR ((TITLE(adverse* W/5 communicat*) OR ABS(adverse* W/5 communicat*)) OR ((TITLE(problem* W/5 communicat*) OR ABS(problem* W/5 communicat*))) OR (((TITLE(poor PRE/0 communicat*) OR ABS(poor PRE/0 communicat*)) OR ((TITLE(obstacle* W/3 communicat*) OR ABS(obstacle* W/3 communicat*)) OR ((TITLE(fail* W/3 communicat*) OR ABS(fail* W/3 communicat*)) OR ((TITLE(inadequate W/5 communicat*) OR ABS(inadequate W/5 communicat*)))))) AND (((TITLE(hospital* OR ward) OR ABS(hospital* OR ward))) OR ((TITLE((doctor* OR physician*)) OR ABS((doctor* OR physician*)) 43

36 ((TITLE(hospital* OR ward) OR ABS(hospital* OR ward))) OR ((TITLE((doctor* OR physician*)) OR ABS((doctor* OR physician*)) OR 238

31 (TITLE((doctor* OR physician*)) OR ABS((doctor* OR physician*))) 30,445

30 (TITLE(hospital* OR ward) OR ABS(hospital* OR ward)) 905,523

29 (((((TITLE(handover* OR hand-over* OR (hand PRE/0 over*)) OR ABS(handover* OR hand-over* OR (hand PRE/0 over*)))) OR ((TITLE(handoff* OR hand-off* OR (hand PRE/0 off*)) OR ABS(handoff* OR hand-off* OR (hand PRE/0 off*)))) OR ((TITLE(shift W/3 change*) OR ABS(shift W/3 change*)) OR ((TITLE((sign PRE/0 off*) OR signoff* OR sign-off*) OR ABS((sign PRE/0 off*) OR signoff* OR sign-off*))) OR ((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) OR (((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) OR ((TITLE("end of shift") OR ABS("end of shift"))) OR ((TITLE(roster PRE/0 change*) OR ABS(roster PRE/0 change*)) OR ((TITLE(information W/3 transfer*) OR ABS(information W/3 transfer*)))) AND (((TITLE(barrier* W/5 communicat*) OR ABS(barrier* W/5 communicat*)) OR ((TITLE(breakdown* W/3 communicat*) OR ABS(breakdown* W/3 communicat*)) OR ((TITLE(obstruct* W/3 communicat*) OR ABS(obstruct* W/3 communicat*)) OR ((TITLE(negative* W/5 communicat*) OR ABS(negative* W/5 communicat*)) OR ((TITLE(adverse* W/5 communicat*) OR ABS(adverse* W/5 communicat*)) OR ((TITLE(problem* W/5 communicat*) OR ABS(problem* W/5 communicat*))) OR (((TITLE(poor PRE/0 communicat*) OR ABS(poor PRE/0 communicat*)) OR ((TITLE(obstacle* W/3 communicat*) OR ABS(obstacle* W/3 communicat*)) OR ((TITLE(fail* W/3 communicat*) OR ABS(fail* W/3

communicat*)) OR ((TITLE(inadequate W/5 communicat*) OR ABS(inadequate W/5 communicat*))))

240

[28 deleted - error]

27 (((TITLE(barrier* W/5 communicat*) OR ABS(barrier* W/5 communicat*))) OR ((TITLE(breakdown* W/3 communicat*) OR ABS(breakdown* W/3 communicat*))) OR ((TITLE(obstruct* W/3 communicat*) OR ABS(obstruct* W/3 communicat*))) OR ((TITLE(negative* W/5 communicat*) OR ABS(negative* W/5 communicat*))) OR ((TITLE(adverse* W/5 communicat*) OR ABS(adverse* W/5 communicat*))) OR ((TITLE(problem* W/5 communicat*) OR ABS(problem* W/5 communicat*))) OR (((TITLE(poor PRE/0 communicat*) OR ABS(poor PRE/0 communicat*))) OR ((TITLE(obstacle* W/3 communicat*) OR ABS(obstacle* W/3 communicat*))) OR ((TITLE(fail* W/3 communicat*) OR ABS(fail* W/3 communicat*))) OR ((TITLE(inadequate W/5 communicat*) OR ABS(inadequate W/5 communicat*)))) 26,198

26 ((TITLE(poor PRE/0 communicat*) OR ABS(poor PRE/0 communicat*)) OR ((TITLE(obstacle* W/3 communicat*) OR ABS(obstacle* W/3 communicat*))) OR ((TITLE(fail* W/3 communicat*) OR ABS(fail* W/3 communicat*))) OR ((TITLE(inadequate W/5 communicat*) OR ABS(inadequate W/5 communicat*))) 5,168

25 ((TITLE(barrier* W/5 communicat*) OR ABS(barrier* W/5 communicat*))) OR ((TITLE(breakdown* W/3 communicat*) OR ABS(breakdown* W/3 communicat*))) OR ((TITLE(obstruct* W/3 communicat*) OR ABS(obstruct* W/3 communicat*))) OR ((TITLE(negative* W/5 communicat*) OR ABS(negative* W/5 communicat*))) OR ((TITLE(adverse* W/5 communicat*) OR ABS(adverse* W/5 communicat*))) OR ((TITLE(problem* W/5 communicat*) OR ABS(problem* W/5 communicat*))) 21,600

24 (TITLE(inadequate W/5 communicat*) OR ABS(inadequate W/5 communicat*)) 730

23 (TITLE(fail* W/3 communicat*) OR ABS(fail* W/3 communicat*)) 2,845

[22 deleted - error]

21 (TITLE(obstacle* W/3 communicat*) OR ABS(obstacle* W/3 communicat*)) 388

20 (TITLE(poor PRE/0 communicat*) OR ABS(poor PRE/0 communicat*)) 1,316

19 (TITLE(problem* W/5 communicat*) OR ABS(problem* W/5 communicat*)) 16,810

18 (TITLE(adverse* W/5 communicat*) OR ABS(adverse* W/5 communicat*)) 415

17 (TITLE(negative* W/5 communicat*) OR ABS(negative* W/5 communicat*)) 1,454

- 16 (TITLE(obstruct* W/3 communicat*) OR ABS(obstruct* W/3 communicat*)) 232
- 15 (TITLE(breakdown* W/3 communicat*) OR ABS(breakdown* W/3 communicat*)) 850
- 14 (TITLE(barrier* W/5 communicat*) OR ABS(barrier* W/5 communicat*)) 2,214
- 13 (((TITLE(handover* OR hand-over* OR (hand PRE/0 over*)) OR ABS(handover* OR hand-over* OR (hand PRE/0 over*)))) OR ((TITLE(handoff* OR hand-off* OR (hand PRE/0 off*)) OR ABS(handoff* OR hand-off* OR (hand PRE/0 off*)))) OR ((TITLE(shift W/3 change*) OR ABS(shift W/3 change*))) OR ((TITLE((sign PRE/0 off*) OR signoff* OR sign-off*) OR ABS((sign PRE/0 off*) OR signoff* OR sign-off*))) OR ((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) OR (((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) OR ((TITLE("end of shift") OR ABS("end of shift"))) OR ((TITLE(roster PRE/0 change*) OR ABS(roster PRE/0 change*))) OR ((TITLE(information W/3 transfer*) OR ABS(information W/3 transfer*)))) 40,684
- 12 ((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*)) OR ((TITLE("end of shift") OR ABS("end of shift"))) OR ((TITLE(roster PRE/0 change*) OR ABS(roster PRE/0 change*))) OR ((TITLE(information W/3 transfer*) OR ABS(information W/3 transfer*))) 14,636
- 11 ((TITLE(handover* OR hand-over* OR (hand PRE/0 over*)) OR ABS(handover* OR hand-over* OR (hand PRE/0 over*)))) OR ((TITLE(handoff* OR hand-off* OR (hand PRE/0 off*)) OR ABS(handoff* OR hand-off* OR (hand PRE/0 off*)))) OR ((TITLE(shift W/3 change*) OR ABS(shift W/3 change*))) OR ((TITLE((sign PRE/0 off*) OR signoff* OR sign-off*) OR ABS((sign PRE/0 off*) OR signoff* OR sign-off*))) OR ((TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*))) 26,428
- 10 (TITLE(information W/3 transfer*) OR ABS(information W/3 transfer*)) 14,185
- 9 (TITLE(doctor PRE/0 transfer*) OR ABS(doctor PRE/0 transfer*)) 2,750
- 8 (TITLE(roster PRE/0 change*) OR ABS(roster PRE/0 change*)) 11
- 7 (TITLE("end of shift") OR ABS("end of shift")) 178
- 6 (TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*)) 280
- 5 (TITLE(sign-out* OR signout*) OR ABS(sign-out* OR signout*)) 280
- 4 (TITLE((sign PRE/0 off*) OR signoff* OR sign-off*) OR ABS((sign PRE/0 off*) OR signoff* OR sign-off*)) 383
- 3 (TITLE(shift W/3 change*) OR ABS(shift W/3 change*)) 11,285

2 (TITLE(handoff* OR hand-off* OR (hand PRE/0 off*)) OR ABS(handoff* OR hand-off* OR (hand PRE/0 off*))) 7,331

1 (TITLE(handover* OR hand-over* OR (hand PRE/0 over*)) OR ABS(handover* OR hand-over* OR (hand PRE/0 over*))) 7,602

Appendix 4.2A The quality assessment of quantitative studies

Author questions ²	(Date)/Appraisal	Maughan et al. (2009)	Sinha et al. (2007)	McSweeney et al. (2011)	Wheat et al. (2012)
Country/Date	USA	USA	USA	USA	USA
"1. Did the study address a clearly focused issue? Yes Can't tell No"	Yes.	The study addressed a clearly focused issue: handover communication between doctors working in an Emergency Department.	Yes. The study addressed a clearly focused issue: it explored clinical directors' perceptions of shift handover (also, it investigated their perceptions as to whether or not standardisation could enhance handover quality).	Yes. The study addressed a clearly focused issue: its main goal was to assess the quality of shift handover practices through quantifying doctors' experiences and perceptions of various handover processes such as communication failures and content omissions*.	Yes. The study addressed a clearly focused issue: the study had two goals: to explore current barrier handover and to carry out handover's quality improvement intervention.
				*Studies investigating the content of handover were excluded from the review (exploring the content of handover was beyond the scope of the present study, however, because the study also explored other barriers to handover such as environment-related barriers, it was included in the review).	Although it was an intervention study, it included an evaluation of handover practices (only the evaluation component of the study was included in the critical review).

² Appraisal questions: "11 questions to help you make sense of descriptive/cross-sectional studies" (Guyatt et al., 1994)

Appendices **Appendix 4.2A** The quality assessment of quantitative studies

Author questions ³	(Date)/Appraisal	Maughan et al. (2009)	Sinha et al. (2007)	McSweeney et al. (2011)	Wheat et al. (2012)
"2. Did the authors use an appropriate method to answer their question? Yes Can't tell No"		Yes. The authors used an appropriate method to answer their questions: a prospective cohort study.	Yes. The authors used an appropriate method to answer their questions: a cross-sectional survey.	Yes. The authors used an appropriate method to answer their questions: two survey questionnaires.	Yes. The authors used an appropriate method to answer their questions: questionnaire survey was used to explore doctors' experiences and perceptions of handover practices.

³ Appraisal questions: "11 questions to help you make sense of descriptive/cross-sectional studies" (Guyatt et al., 1994)

"3. Were the subjects recruited in an acceptable way? Yes Can't tell No"	Can't tell.	Can't tell.	Can't tell.	Can't tell.
	<p>A convenience sampling was used in the study; hence selection bias cannot be eliminated.</p> <p>No demographic information was collected (such as doctors' length of experience).</p>	<p>The questionnaire was distributed to the clinical directors at teaching hospitals only. Their opinions of handover practices could differ from those of clinical directors at hospitals which have no affiliation with universities.</p> <p>One hundred eighty five (185; 61.1%) out of 303 (258 Emergency Medicine programme directors and 35 Emergency Medicine associate directors from residency programmes). Although 48.9% of doctors did not respond to the survey, the study failed to test for differences between those doctors who responded (respondents) and those who did not (non-respondents).</p>	<p>The study failed to report a power calculation. The participants were recruited from one hospital, which at the time of the study employed a handover system. The authors failed to describe a sampling approach used.</p> <p>A sample size was small: the questionnaire survey was sent to 139 doctors (45 interns and 94 junior and senior doctors). All eligible doctors were invited to participate, that is those who '...completed at least 1 inpatient ward month prior to administration of the survey' (p.58). Seventy seven doctors (55%) completed and returned the questionnaire.</p> <p>Despite that 45% of doctors working in the hospital did not return the questionnaire, the study failed to test for differences between those who completed and returned the questionnaire (respondents) and those who did not (non-respondents). Regarding external validity: the results cannot be generalised to other settings.</p>	<p>Can't tell.</p> <p>Selection bias cannot be eliminated as the sample represented the internal medicine residents who were seeking support to improve communication at shift handover.</p> <p>The questionnaire was distributed to all doctors working in a department. The response rate was high. 88 (120) of residents completed and returned the questionnaire.</p> <p>No evidence of performing a power calculation was provided.</p> <p>The external validity criterion was appraised as not met in the study.</p>

Appendices Appendix 4.2A The quality assessment of quantitative studies

Author questions ⁴	(Date)/Appraisal	Maughan et al. (2009)	Sinha et al. (2007)	McSweeney et al. (2011)	Wheat et al. (2012)
"4. Were the measures accurately measured to reduce bias? Yes Can't tell No"	Can't tell. For 'Yes': (1) A structured observation protocol was used. (2) Twice per month the researchers observed the same handovers to evaluate interobserver variability. The interobserver agreement, Cappa coefficient, was high: 0.75 (95% CI, 0.72-0.78). [The value of Cappa coefficient can vary from 0 (low agreement) to 1 (high agreement)]. For 'No': (1) Observations were 'hand' recorded which could mean that researchers could miss some important events, especially that the data were collected in a busy Emergency Department. (2) Furthermore, effects of selection bias cannot be eliminated as the data were not collected from two night handover sessions "the attending handoff at 1 a.m. and the resident handoff at 3 a.m. ... based on	Can't tell. The authors failed to provide sufficient details. The study failed to report if the questionnaire survey was validated.	Can't tell. The authors failed to provide any details. The study failed to report if the questionnaire was validated.	Can't tell. The authors failed to provide any details. The study failed to report if the questionnaire was validated.	Can't tell. The authors reported that the questionnaire was 'reviewed' by faculty prior to being distributed... 40, but they failed to provide further details.

⁴ Appraisal questions: "11 questions to help you make sense of descriptive/cross-sectional studies" (Guyatt et al., 1994)

Appendices **Appendix 4.2A** The quality assessment of quantitative studies

the very low number of handoffs anticipated" (p. 504). Potentially, night handovers present different challenges to doctors than day handovers.					
Author questions ⁵	(Date)/Appraisal	Maughan et al. (2009)	Sinha et al. (2007)	McSweeney et al. (2011)	Wheat et al. (2012)
"5. Were the data collected in a way that addressed the research issue? Yes Can't tell No"		Yes. The data were collected in a way that addressed the research issue. The researchers provided a clear description of data collection methods. The observers used the structured collection form.	Yes. The data were collected in a way that addressed the research issue. The researchers provided a comprehensive description of a questionnaire survey used.	Yes. The data were collected in a way that addressed the research issue. The setting for data collection was justified and the researchers provided a clear description of the methods used to collect the data.	Yes. The data were collected in a way that addressed the research issue. The authors justified the setting data collection. [The study was initiated by a small group of doctors who sought to improve handover practices. The questionnaire was distributed on an intranet.]

⁵ Appraisal questions: "11 questions to help you make sense of descriptive/cross-sectional studies" (Guyatt et al., 1994)

Appendices **Appendix 4.2A** The quality assessment of quantitative studies

Author questions ⁶	(Date)/Appraisal	Maughan et al. (2009)	Sinha et al. (2007)	McSweeney et al. (2011)	Wheat et al. (2012)
"6. Did the study have enough participants to minimize the play of chance? Yes/Can't tell/No"		Can't tell. The sample included approximately 110 shift handovers which accounted for 992 sessions (797 of which were included in the data analysis). The study failed to present the evidence of performing a power calculation. The results were rated as not generalisable to the wider population of doctors who conduct shift handover. Potential threats to generalisation included a small sample size and selection bias.	No. The authors have identified the limitations, that is, the plausibility of reporting bias. The study failed to present the evidence of performing a power calculation.	No. The study failed to report a power calculation. The study's sample size was small.	No. The study failed to present the evidence of performing a power calculation. The study's sample size was small.

⁶ Appraisal questions: "11 questions to help you make sense of descriptive/cross-sectional studies" (Guyatt et al., 1994)

"7. How are the results presented and what is the main result? Yes Can't tell No"	Yes.	Can't	tell.	Yes.	Yes.
	<p>The study utilised multivariate negative binomial regression models.</p> <p>Results were reported as Relative Risk (RR), with corresponding confidence intervals (CIs) estimated at the 95%. Regression models were employed to identify if given handover factors were linked to communication errors.</p> <p>The main findings: Median of 0.8 - 1.4 interruptions per handover session; Each handover with at least 1 interruption - 101 (10.2%); Handovers with interruptions by staff - 90 (9.1%); Handovers with interruptions by telephone/pager - 17 (1.7%);</p> <p>The outcome measures are communication errors and omissions related to the content of handover. Of note, use of handwritten support materials was associated with fewer errors and omissions.</p>	<p>The results were presented as percentage of doctors' (clinical directors') experiences and perceptions of the current handover practices, including barriers.</p>	<p>The frequency response analysis was used. The frequencies interns and residents were analysed separately and together (t test). P values were reported, whereas CIs were unreported.</p>	<p>As regards the chance, p-values were reported for three statistics (pre-post findings comparison of the study design). CIs were unreported.</p>	

Appendices **Appendix 4.2A** The quality assessment of quantitative studies

<p>"8. Was the data analysis sufficiently rigorous? Yes Can't tell No"</p>	<p>Yes. Confidence intervals (CIs) were reported. Regarding regression models, the authors failed to provide sufficient details regarding data analysis to assess/rate if they have done it correctly. However, studies which employ statistical modelling techniques might find it challenging to rigorously describe the data analysis process due to word limits for research articles. The data analysis of the study was therefore rated as sufficiently rigorous - 'yes'.</p>	<p>Don't CIs were unreported in the study. P-values were reported for two significant results: "when responses between ED residency program directors are compared with those from pediatric ED fellowship directors, a significant larger proportion of pediatric EM fellowship directors states that sign-outs in their ED occur separately between attending physicians and residents or fellows (62.5% vs. 32%, $p < 0.001$) - but this has not been recognised as a barrier by the respondents. Another statistically significant finding was an agreement between both group of directors that their institutions do not provide teaching sessions dedicated to handover (93.8% vs. 68.3%; $p < 0.002$).</p>	<p>Yes. The authors provided a clear statement of findings and provided a discussion of the evidence from previous studies for their argument. With regard to barriers to effective shift handover communication, the following were identified: p. 45: Out of date, incomplete records; Interruptions continued to be a problem even after the intervention of training The key results included Interruptions; Doctors are in a hurry to go home; lack of up-to-date information; written records are outdated; irrelevant information included in records resulting in lack of validity; lack of feedback; lack of time; poor coordination; high patient load, skilled learned on the job, lack of teaching, lack of a system to update information, junior doctors need more instructions, no instructions on how to conduct handover.</p>
<p>"9. Is there a clear statement of findings? Yes Can't tell No"</p>	<p>Yes. Barriers: Interruptions: Other staff, patient care & phone/pager; The study reports that 40.5% of doctors asked questions during handover, which</p>	<p>Yes. The following barriers to shift handover were identified: as Transfer of responsibility (NS); Verbal handover only (NS)[not</p>	<p>Yes. The results could be applied to doctors who work in hospitals in the Czech Republic After the intervention residents with interactive</p>

Appendices **Appendix 4.2A** The quality assessment of quantitative studies

means that more than half of doctors do not actively participate in handover.	updated records]; handover conducted in a common area (NS). "Transfer of attending responsibility at shift change: rarely documented 79 (42.9%)." p. 194; "...only 12 (6.5%) physicians indicated that the transfer of attending responsibility at change of shift is always documented."	give a complete verbal sign-outs":	during handover has increased "..."informal feedback indicated the level of interruption/distract arising from within the group sign out rather than from external sources." p. 46; "
In terms of the content of handover, errors were observed in 13.1%, and omissions in 45.1% of handovers [beyond the scope of the present study].	"Location for sign-out - common area within ED - 73.5%.; do not have any uniform written policy regarding sign-out in their department - 89.5%" p. 194 "...although a majority of physicians reported that "transfer of attending responsibility" was documented "most of the time", a significant proportion of respondents indicated that such documentation was rare." p. 195	When the respondents were asked to compare how various factors affect their both verbal and written handovers:	
Longer handovers were associated with more errors.	The study did not test for differences between those directors who responded to the survey and those who did not. "Yes". Blurry, undocumented transfer of responsibility between doctors; lack of training (p < 0.002)	These barriers were perceived by doctors to affect both types of handover:	
Doctors provided feedback during approximately 6.1% of shift handover, which was considered by the authors as an obstacle to handover effectiveness.	"only 19% of the residents agreed with the statement that written sign-outs at the start of their shifts were up to date." p. 60;	nursing interruptions verbal - 70; written 69.1; paging interruptions verbal - 75.7; written 76.2; Phone interruptions - verbal 60; written 64.3;	
Furthermore, the authors provided an adequate discussion of the evidence from previous empirical studies both for and against their own arguments.	"Almost 73% of all intern and resident respondents noted that they had experienced uncertainty in the past regarding a patient care plan because of receiving an incomplete verbal handoff". p. 59)	"The authors presented an adequate discussion of the evidence for, but they failed to discuss the evidence against their arguments.	
"10. Can the results be applied to the local population? Yes No"	Don't know.	Yes.	Yes.
	The sample included only clinical directors from teaching hospitals.		

"11. How valuable is the research?"	Yes.	Yes.	Yes.	Yes.
<p>The study has made an important contribution to the knowledge of barriers to conducting shift handover effectively.</p> <p>However, the quality assessment has raised an ethical issue. Namely, the observed doctors were unaware of the purpose of the study. They were informed that "the observers would be conducting "workload" research" in the ED, but they were not informed of the study's emphasis on handoffs or of the specific data being collected." p. 504</p>	Yes.	<p>The research seemed to raise the clinical directors' awareness of the importance of handover.</p>	<p>The study has made an important contribution to the knowledge of barriers to conducting shift handover effectively.</p>	<p>The study has provided some important insights into barriers to shift handover communication between doctors. In particular, answers to an open-ended question about barriers to shift handover communication were very informative.</p>

Appendix 4.2B The quality assessment of a mixed-method study

Authors (Date)/Appraisal questions	Appraisal of a quantitative component	Bomba DT, Prakash R. (2005)	Appraisal of a qualitative component ⁸	Bomba DT, Prakash R. (2005)
"1. Did the study address a clearly focused issue? Yes/Can't tell/No"	Yes. The study addressed a clearly focused problem, barriers to shift handover between doctors.			"1. Was there a clear statement of the aims of the research?" Yes.
"2. Did the authors use an appropriate method to answer their question? Yes/Can't tell/No"	Yes. The researchers used appropriate methods to answer their questions: a mixed-methods study including observations, interviews and a questionnaire survey.			"2. Is a qualitative methodology appropriate?" Yes.

⁷ Appraisal questions: '11 questions to help you make sense of descriptive/cross-sectional studies' Guyatt et al. (1994)

⁸ Appraisal questions: the Critical Appraisal Skills Programme's (CASP's) appraisal tool "10 questions to help you make sense of qualitative data"

Appendix 4.2C The quality assessment of qualitative studies

Authors(Date)/ Appraisal questions ⁹	Raduma-Tomas (2011)	Cleland et al. (2008)	Yang et al. (2011)
"1. Was there a clear statement of the aims of the research? Yes/Can't tell/No"	Yes. The goal of the study was to "provide a detailed examination of handovers by systematically describing hospital doctors' shift handovers using hierarchical task analysis (HTA), and exploring the discrepancies between actual and ideal handover practice" p. 211. The study evaluated handover practices and barriers to effective shift handover communication encountered by junior doctors.	Yes. The purpose of the study was to explore doctors' (Foundation Year, Senior House Officers, Registrars and Consultants) and nurses' experiences and perceptions of handover practices [with the aim to identify how handover practices could be optimised]. Since the study included separate focus groups for doctors and nurses, and since the results were analysed separately for the two groups, the study was included in the review.	Yes. The study had three goals, these were to: I. understand the process of handover; II. identify any barriers to handover, and; III. propose how handover could be improved.
"2. Is a qualitative methodology appropriate? Yes/Can't tell/No"	Yes. The researchers sought to explore the participants' experiences and perceptions.	Yes. The researchers sought to explore the participants' experiences and perceptions.	Yes. The study sought to explore doctors' experiences and perceptions.

⁹ Appraisal questions: the Critical Appraisal Skills Programme's (CASP's) appraisal tool "10 questions to help you make sense of qualitative data".

<p>"3. Was the research design appropriate to address the aims of the research? Yes /Can't tell/No"</p>	<p>Yes.</p> <p>Methods used: interviews, observations of handover sessions and a focus group discussion.</p> <p>A focus group focused on exploring doctors' experiences and perceptions of factors underlying ineffective handovers.</p>	<p>Yes.</p>	<p>Yes.</p>
<p>"4. Was the recruitment strategy appropriate to the aims of the research? Yes /Can't tell /No"</p>	<p>Can't tell.</p> <p>Recruitment strategy could be improved as only a small sample of doctors chose to take part in the study. Details:</p> <p>All doctors (22) working in the AMAU were invited to participate in the study. Thirteen doctors agreed to take part in an interview. Six doctors agreed to participate in a focus group discussion.</p> <p>The authors failed to discuss why nine doctors chose not to participate in an interview and why sixteen doctors chose not to participate in a focus group discussion.</p> <p>Despite the study sample size was small, the researchers seemed to collect sufficient data to support their arguments.</p>	<p>Can't tell.</p> <p>Recruitment strategy could be improved as only a small sample of doctors chose to take part in the study. Also, the authors failed to provide information about how many doctors were invited to participate in the study.</p> <p>In total, 11 doctors (3 consultants, 5 SpRs, 3 Foundation Year doctors) took part in the study. [Nurses are not listed here as the review focused exclusively on shift handover communication between doctors].</p>	<p>Can't tell.</p> <p>The authors provided a partial description of participants' recruitment. All doctors working in one general medicine ward were invited to participate in the study, but no further details were given.</p> <p>Of note, only junior or relatively junior doctors participated in the study (medical Officers with length of experience varying from 6 months to 4 years).</p>

Authors(Date)/ Appraisal questions ¹⁰	Raduma-Tomas (2011)	Cleland et al. (2008)	Yang et al. (2011)
"5. "Was the data collected in a way that addressed research issue? Yes/Can't tell/No"	<p>Yes.</p> <p>The data was collected in a way that addressed the research problem.</p> <p>The authors justified the setting for data collection (an Acute Medical Assessment Unit AMAM). They also made explicit the methods of data collection used in the study.</p> <p>The study included interviews, observations of shift handover sessions and a focus group discussion. The authors provided a comprehensive description of how each method contributed towards answering the research questions addressed by the study.</p> <p>In total, the authors observed thirty two shift handover sessions, conducted thirteen interviews and one focus group discussion.</p>	<p>Yes.</p> <p>The authors developed a semi-structured focus group schedule. The initial version of the schedule was reviewed by the key stakeholders (e.g. the Postgraduate Deanery).</p> <p>The final version of the schedule included items related to: the meaning of handover, characteristics of effective and ineffective handovers, factors influencing handover effectiveness and capabilities and skills necessary to communicate effectively at handover.</p> <p>In total, four focus groups were conducted with doctors: one with doctors in training (Foundation Year), one with Senior House Officers, one with Registrars and one with Consultants.</p> <p>The study failed to discuss data saturation, most likely because a study's sample size was small.</p>	<p>Yes.</p> <p>The setting for data collection was justified and the authors provided a clear description of how the data were collected.</p> <p>Interviews were digitally recorded and transcribed. The authors failed, however, to report whether interviews were transcribed verbatim or not.</p> <p>In addition, the authors failed to discuss data saturation.</p>

¹⁰ Appraisal questions: the Critical Appraisal Skills Programme's (CASP's) appraisal tool "10 questions to help you make sense of qualitative data".

Authors(Date)/ Appraisal questions ¹¹	Raduma-Tomas (2011)	Cleland et al. (2008)	Yang et al. (2011)
"6. Has the relationship between researcher and participants been adequately considered? Yes/Can't tell/No"	Can't tell. The participants were involved in designing the study and analysing the data (which might have weakened the credibility of the results).	No. The authors failed to discuss their role and whether or not they did anything to avoid research bias.	Can't tell. The authors failed to discuss whether or not they did anything to avoid research bias.
"7. Have ethical issues been taken into consideration? Yes/Can't tell/No"	Yes. Ethical standards were maintained throughout the study. The authors sought the ethics committee approval. The participants gave their consent to participate in the study.	Yes. The authors sought the approval of the ethics committee. The participants gave their consent to participate in the study.	Can't tell. The study failed to provide any details of how the participants were invited to take part in the study. The National Healthcare Group (NHG) Domain Specific Review Boards (DSRBs) approved the study. The participants gave their consent to participate in the study.

¹¹ Appraisal questions: the Critical Appraisal Skills Programme's (CASP's) appraisal tool "10 questions to help you make sense of qualitative data".

Appendices **Appendix 4.2C** The quality assessment of qualitative studies

Authors(Date)/ Appraisal questions ¹²	Raduma-Tomas (2011)	Cleland et al. (2008)	Yang et al. (2011)
"8. Was the data analysis sufficiently rigorous? Yes /Can't tell/No"	<p>Can't tell.</p> <p>The authors failed to provide describe the data analysis in sufficient detail.</p> <p>Although the authors presented sufficient data to support the findings, they failed to present any contradictory data (but perhaps there were none).</p> <p>The authors failed to discuss their own role and whether they did anything to avoid research bias. In fact, they failed to discuss any limitations of the study. On the other hand, they presented a number of arguments supporting their conclusions.</p>	<p>Yes.</p> <p>The data analysis was sufficiently rigorous.</p> <p>The researchers described in detail the data analysis process. They employed Framework Analysis to interpret the data. Of note, the data were analysed by medical and non-medical researchers.</p>	<p>Can't tell.</p> <p>As the process of the data analysis was described by the authors only partially, it is difficult to say if the data analysis was sufficiently rigorous.</p> <p>In the authors' defence, when presenting the findings from the study, they presented the original data to support their arguments. They failed, however, to report whether or not they collected any contradictory data.</p>

¹² Appraisal questions: the Critical Appraisal Skills Programme's (CASP's) appraisal tool "10 questions to help you make sense of qualitative data".

<p>"9. Is there a clear statement of findings? Yes/Can't tell/No"</p>	<p>Yes.</p>	<p>Quotes from the study:</p>	<p>Yes.</p>	<p>Yes.</p>
<p>"There is realistically not enough time for doctors to adequately prepare their handovers in between assessing new AMAU patients." Lack of time. "...junior doctors explained... that they always prioritised providing immediate care to patients arriving..." - staff shortages, high patients' volumes (workload).</p> <p>"Observations found that on few occasions (n=4 shift handovers) when missing information was not captured during the handover meeting, the step-down team junior doctors, having realised this post-handover, sought to resolve this (usually by returning to ask the admitting team doctors) before they could finalise how to prioritise patient care.</p> <p>The authors identified information omissions which included: "requested investigations... treatment plans... and anticipatory guidance..." - however, since exploring the details of handovers' content were beyond the scope of the present study, this barrier was excluded.</p> <p>Of note, the authors seem to identify information omissions as the consequences of barriers to handover, e.g. not updated records, rather than being barriers themselves.</p>				<p>The results revealed differences between junior and senior doctors' perceptions of the meaning of handover (definition).</p> <p>"Junior doctors felt they were not provided with sufficient information about individual patient circumstances or which patients to prioritise..."</p> <p>Senior doctors believed that junior doctors find it difficult to elicit essential information for the provision of a patient's care. Furthermore, they felt that junior doctors lack professionalism.</p> <p>Doctors learned how to conduct handover on the job, via trial and error and this method of learning was perceived as "not necessarily reliable".</p> <p>Environment/System-related barriers to handover identified in the study included: lack of time, too many patients, lack of handover structure and the absence of handover training.</p>
				<p>Yes, there is a clear statement of findings. The identified barriers included:</p> <p>Doctors do not complete records; rather, they "retrieve patients' relevant information from memory directly".</p> <p>Also, the authors discussed problems with the content of handover (which was beyond the scope of the present study) - omissions of information.</p> <p>The other barriers to handover included: lack of a designated place to conduct handover, interruptions including "environmental noise", verbal handover only, lack of formal handover documents, high workload and lack of time.</p>

"10. How valuable is the research?"	Yes.		Yes.		Can't tell.
	<p>The research provided important insights into barriers to shift handover communication between doctors. The authors discussed the contribution their study made to existing knowledge and considered the results of their study in relation to the current practices and relevant empirical evidence.</p>	<p>The study provided an important insight into barriers related to the context in which handover is conducted (e.g. lack of time). Also, the results of the study suggested that junior doctors' involvement in handover may decrease its effectiveness.</p> <p>However, because of a small sample size the results should be interpreted with caution.</p>			<p>The study provided some interesting insights into the process of handover. However, the study could have been described in a more rigorous way.</p>

Barriers to shift handover communication between doctors in hospitals in the Czech Republic

What is this survey about?

- This survey explores your experiences and perception of factors negatively affecting the effectiveness of shift handover* communication between doctors in your department.

How do I complete the survey and how long is it going to take?

Most of the questions require you to tick a box or circle the chosen response.

It should take you about 10 minutes to complete the survey.

Who will see my answers?

- The survey is anonymous. No individuals can be identified in connection with any of the results.

How do I return a survey?

- The completed survey can be returned in the enclosed envelope (via internal mail).
- Please return by.....

Researcher Contact Details: Katarzyna Karolina Machaczek

Address: Faculty of Health and Wellbeing, 32 Collegiate Crescent, Room 204

32 Montgomery House, Sheffield, S10 2BP, UK

Telephone numbers: +44 (0)114 225 XXXX / XXXX (direct line)

+44 (0)114 225 XXXX

*Shift Handover in this current survey involves the transfer of information, responsibility and authority for patient care from one doctor to another (or a group of clinicians) at the end/beginning of the shift.

Barriers to shift handover communication between doctors in hospitals in the Czech Republic

1 Have you had any formal training in how to communicate effectively during shift handover? Yes/No

If **YES** please tick all that apply

- | | | |
|----------|---|--------------------------|
| a | Examples of good practice. | <input type="checkbox"/> |
| b | Case studies. | <input type="checkbox"/> |
| c | Analysis of adverse events and near misses. | <input type="checkbox"/> |
| d | Video demonstrating good and poor handover communication. | <input type="checkbox"/> |
| e | Training materials. | <input type="checkbox"/> |
| f | Coaching by experienced staff. | <input type="checkbox"/> |
| g | Workshops, training courses. | <input type="checkbox"/> |
| h | Organisational guidelines. | <input type="checkbox"/> |
| i | National guidelines. | <input type="checkbox"/> |
| j | International guidelines. | <input type="checkbox"/> |
| k | A part of the induction process. | <input type="checkbox"/> |
| l | Other (please specify) | <input type="checkbox"/> |

.....

2 Please indicate to what extent the following negatively affect your ability to communicate to and receive handover information from other clinicians.

Strongly Agree Strongly Disagree

Individual	1	2	3	4
a Messy records (e.g. inconsistent use of terminology; use of graphical symbols that are not commonly used).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Illegible handwriting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Out of date records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Poor communication skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e Not listening and interrupting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Irrelevant information is provided during handover.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g Difficulty in recognising which information is essential to the provision of patient care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h Handover communication with more junior/senior members of staff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i Disagreements between clinicians regarding a patient's medical condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j Incorrectly recalled information.				
k Other (please specify).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3 Please indicate to what extent the following negatively affect your ability to communicate effectively during handover:**
- Strongly Agree Strongly Disagree

Work Environment-related barriers	1	2	3	4
a Information that may be relevant to the patient's condition is not available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b There are follow up queries and a doctor who was responsible for the patient during the previous shift is not available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c Tests results that may be relevant to the patient's condition are not available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d Interruptions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e High background noise levels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f Long working hours.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g Staff shortages.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h Not enough time/ busy periods in the department.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i Poor workforce planning (for example, poor organisation of staff's rotas).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

.....

.....

- 4 Please indicate to what extent the following reflect your experience of conducting handover:**
- | | |
|----------|----------|
| Strongly | |
| Agree | Strongly |
| | Disagree |

Other barriers

1 2 3 4

- a** The division of responsibility is unclear ☐ ☐ ☐ ☐
- b** Information that may be relevant to the patient's condition is not available (e.g. a patient's medical condition). ☐ ☐ ☐ ☐
- Follow up queries and a doctor who was responsible for the patient during the previous shift is not available
- c** Other (please specify) ☐ ☐ ☐ ☐

.....

.....

.....

BACKGROUND INFORMATION

5 What is your current position?

.....

6 What is the nature of your work?

☐ Full time ☐ Part time ☐ Other (please specify)

7 How long have you worked in your current job?YearsMonths

Thank you for completing this survey; if you have any comments please write them here:



Katarzyna Karolina Machaczek
Centre for Health and Social Care Research (CHSCR)
The Faculty of Health and Wellbeing
Sheffield Hallam University
32 Montgomery House
32 Collegiate Crescent
S10 2BP
Sheffield, UK

Date...

Dear...

I would like to invite you to participate in a research study undertaken by The Centre for Health and Social Care Research at Sheffield Hallam University (UK). The study is exploring the Czech Republic doctors' experiences and perceptions of how various individual performance-, work environment- and system-related factors may collectively contribute to ineffective shift handover communication between doctors working in hospitals in the Czech Republic. Ethical approval for the research was granted from the Sheffield Hallam University Research Ethics Committee and Research Governance permission was granted by the Research and Development Departments at your hospital. The study is carried out as a part of a postgraduate degree (PhD) in Health Services Research.

I am inviting doctors working in internal medicine, general surgery, gynaecology, neonatal care, neurology, orthopaedics, renal, urology and obstetrics, where shift handover communication is a routine practice. If you would like to participate in the study, please read the attached information sheet for more details.

If you wish to participate in the study, please complete and return the attached questionnaire survey. If you would like to receive more information about the study please send me an email on K.Machaczek@shu.ac.uk.

Thank you for taking your time to read this letter.

Yours Sincerely,

Katarzyna Karolina Machaczek

Date...

What is the purpose of the study?

The overarching purpose of the study is to develop a new theoretical position, hypotheses, on how various factors and mechanisms may collectively contribute to ineffective shift handover communication between doctors working in hospitals in the Czech Republic. As well as this broad aim, the study has three objectives:

- I. To investigate whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic.
- II. To identify the Czech Republic doctors' experiences and perceptions of the key barriers to effective shift handover communication.
- III. To explore the Czech Republic doctors' experiences and perceptions of the causes of barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic.

What does the study involve?

The study comprises two empirical components, a questionnaire survey and semi-structured interviews with doctors. The purpose of the questionnaire survey on doctors' perceptions of whether or not effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic, and to identify the Czech Republic doctors' perceptions of the key barriers to effective shift handover communication. The purpose of semi-structured interviews is to explore the Czech Republic doctors' experiences and perceptions of the causes of barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic.

What does taking part involve?

Taking part in the study involves completing and returning the attached questionnaire survey, asking for

your opinion on whether various factors and mechanisms identified in hospitals around the world may collectively contribute to ineffective shift handover communication between doctors working in hospitals in the Czech Republic. Your responses will also help me to identify the key barriers to effective shift handover communication between doctors.

In addition, participating in the study involves taking part in an interview. During the interview I would ask you questions about your experiences and perceptions of the causes of the key barriers (as identified via the questionnaire survey) to effective communication at shift handover. The interview would be conducted at time and place most convenient for you.

Why have I been selected?

We have selected you to participate in this study because you work as a doctor in a hospital department where shift handover communication is a routine practice (internal medicine, general surgery, gynaecology, neonatal care, neurology, orthopaedics, renal, urology or obstetrics).

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part you will be asked to provide informed consent.

Even if you decide to take part in the study, you are still free to withdraw at any time and without giving a reason. A decision not to take part in the study, or to withdraw at any time (for example you are happy to complete the questionnaire survey but would prefer not to take part in an interview), will not affect you in any way.

How do I provide consent to take part in the study?

Consent to participate is given in three ways. The return of the questionnaire will be taken to imply consent. In addition, if you decide to take part in an interview, you will be asked to sign a consent form (if an interview will be conducted face-to-face), or send an email to K.Machaczek@shu.ac.uk (if an interview will be conducted over the telephone).

What will happen to me if I take part?

During the study period you will be asked to complete a questionnaire survey and to take part in an

interview. Agreeing to participate in one component (e.g. a questionnaire survey), does not oblige you to take part in the other part of the study (an interview). The questionnaire will take you up to 20 minutes to complete. The interview may take up to 40 minutes, to allow us to explore plausible causes of barriers to effective communication at shift handover between doctors. The interview will be digitally recorded.

What are the possible benefits of taking part?

Insights into handover practices we gain during this study may have informed the current handover practices.

Will my taking part in this study be kept confidential?

Yes.

The investigators will keep all information confidential. The questionnaire is anonymous and we seek very limited information about your work such as the length of your employment and your current position, to ensure that you cannot be identified from the data published from the study.

Although the interview will be digitally recorded, any information that you provide will be anonymised so you cannot be recognised from it. The recordings will be kept until interviews have been transcribed and then destroyed. Transcribed interviews will be stored securely in a research office at Sheffield Hallam University for 5 years. Afterwards they will be destroyed too.

Contact for further information

If you require any further information about the study or you wish to make a complaint about the conduct of the research please contact:

Katarzyna Karolina Machaczek
Centre for Health and Social Care Research
Sheffield Hallam University
32 Collegiate Crescent
32 Montgomery House
S10 2 BP
Tel. + 44 (114) 225 XXXX
Email: K.Machaczek@shu.ac.uk

Thank you for taking your time to read this information sheet

The results of data analysis and this followed by the identification of percentage agreement for each variable.

Frequency Tables

Information that may be relevant to the patient's condition is not available

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	162	89.5	89.5	89.5
Valid Disagree/Strongly Disagree	19	10.5	10.5	100.0
Total	181	100.0	100.0	

Unavailable information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree/Strongly Agree	132	72.9	73.7	73.7
	Disagree/Strongly Disagree	47	26.0	26.3	100.0
	Total	179	98.9	100.0	
Missing	System	2	1.1		
Total		181	100.0		

Follow up queries and a doctor who was on duty during the previous shift is not available

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree/Strongly Agree	149	82.3	82.3	82.3
	Disagree/Strongly Disagree	32	17.7	17.7	100.0
	Total	181	100.0	100.0	

Messy Records

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	177	97.8	97.8	97.8
Valid Disagree/Strongly Disagree	4	2.2	2.2	100.0
Total	181	100.0	100.0	

Illegible records

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	175	96.7	96.7	96.7
Valid Disagree/Strongly Disagree	6	3.3	3.3	100.0
Total	181	100.0	100.0	

Incorrectly Recalled Information

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	121	66.9	66.9	66.9
Valid Disagree/Strongly Disagree	60	33.1	33.1	100.0
Total	181	100.0	100.0	

Out of Date Records

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	173	95.6	95.6	95.6
Valid Disagree/Strongly Disagree	8	4.4	4.4	100.0
Total	181	100.0	100.0	

Irrelevant medical information is provided during handover

	Frequency	Percent	Valid Percent	Cumulative Percent
--	-----------	---------	---------------	--------------------

	Agree/Strongly Agree	109	60.2	60.6	60.6
Valid	Disagree/Strongly Disagree	71	39.2	39.4	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

Busy periods in the department/hospital

	Frequency	Percent	Valid Percent	Cumulative Percent
	Agree/Strongly Agree	115	63.5	63.5
Valid	Disagree/Strongly Disagree	66	36.5	100.0
	Total	181	100.0	

The division of responsibility is unclear

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	156	86.2	86.2	86.2
Valid Disagree/Strongly Disagree	25	13.8	13.8	100.0
Total	181	100.0	100.0	

Communication with more senior/junior members of staff (doctors)

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	144	79.6	79.6	79.6
Valid Disagree/Strongly Disagree	37	20.4	20.4	100.0
Total	181	100.0	100.0	

Not listening and interrupting

	Frequency	Percent	Valid Percent	Cumulative Percent
--	-----------	---------	---------------	--------------------

	Agree/Strongly Agree	118	65.2	65.2	65.2
Valid	Disagree/Strongly Disagree	63	34.8	34.8	100.0
	Total	181	100.0	100.0	

Difficulty in recognising which information is essential for the patient's care

		Frequency	Percent	Valid Percent	Cumulative Percent
	Agree/Strongly Agree	107	59.1	59.1	59.1
Valid	Disagree/Strongly Disagree	74	40.9	40.9	100.0
	Total	181	100.0	100.0	

Disagreements between clinicians regarding medical diagnosis

	Frequency	Percent	Valid Percent	Cumulative Percent
--	-----------	---------	---------------	--------------------

	Agree/Strongly Agree	108	59.7	59.7	59.7
Valid	Disagree/Strongly Disagree	73	40.3	40.3	100.0
	Total	181	100.0	100.0	

Poor Communication Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
	Agree/Strongly Agree	135	74.6	75.0	75.0
Valid	Disagree/Strongly Disagree	45	24.9	25.0	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

Not enough time

	Frequency	Percent	Valid Percent	Cumulative Percent
--	-----------	---------	---------------	--------------------

	Agree/Strongly Agree	148	81.8	81.8	81.8
Valid	Disagree/Strongly Disagree	33	18.2	18.2	100.0
	Total	181	100.0	100.0	

Busy periods in the department/hospital

		Frequency	Percent	Valid Percent	Cumulative Percent
	Agree/Strongly Agree	142	78.5	78.9	78.9
Valid	Disagree/Strongly Disagree	38	21.0	21.1	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

Interruptions

	Frequency	Percent	Valid Percent	Cumulative Percent
--	-----------	---------	---------------	--------------------

Valid	Agree/Strongly Agree	138	76.2	76.2	76.2
	Disagree/Strongly Disagree	43	23.8	23.8	100.0
	Total	181	100.0	100.0	

Lack of a designated place for handover communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree/Strongly Agree	117	64.6	65.0	65.0
	Disagree/Strongly Disagree	63	34.8	35.0	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

High background noise levels

	Frequency	Percent	Valid Percent	Cumulative Percent
--	-----------	---------	---------------	--------------------

	Agree/Strongly Agree	75	41.4	41.4	41.4
Valid	Disagree/Strongly Disagree	106	58.6	58.6	100.0
	Total	181	100.0	100.0	

Long working hours

		Frequency	Percent	Valid Percent	Cumulative Percent
	Agree/Strongly Agree	130	71.8	71.8	71.8
Valid	Disagree/Strongly Disagree	51	28.2	28.2	100.0
	Total	181	100.0	100.0	

Staff Shortages

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	120	66.3	66.3	66.3
Valid Disagree/Strongly Disagree	61	33.7	33.7	100.0
Total	181	100.0	100.0	

Poor workforce planning

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree/Strongly Agree	147	81.2	81.2	81.2
Valid Disagree/Strongly Disagree	34	18.8	18.8	100.0
Total	181	100.0	100.0	

Date...

What is the purpose of the study?

The overarching purpose of the study is to develop a new theoretical position, hypotheses, on how various factors and mechanisms may collectively contribute to ineffective shift handover communication between doctors working in hospitals in the Czech Republic. As well as this broad aim, the study has three objectives:

- I. To investigate whether similar barriers to effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic.
- II. To identify the Czech Republic doctors' experiences and perceptions of the key barriers to effective shift handover communication.
- III. To explore the Czech Republic doctors' experiences and perceptions of the causes of barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic.

What does the study involve?

The study comprises two empirical components, a questionnaire survey and semi-structured interviews with doctors. The purpose of the questionnaire survey on doctors' perceptions of whether or not effective shift handover communication between doctors identified in hospitals around the world are identified by doctors working in hospitals in the Czech Republic, and to identify the Czech Republic doctors' perceptions of the key barriers to effective shift handover communication. The purpose of semi-structured interviews is to explore the Czech Republic doctors' experiences and perceptions of the causes of barriers to effective shift handover communication between doctors working in hospitals in the Czech Republic.

What does taking part involve?

Taking part in this component of the study involves taking part in an interview. During the interview I would ask you questions about your experiences and perceptions of the causes of the key barriers (as identified via the questionnaire survey) to effective communication at shift handover.

Am I eligible for inclusion?

To be eligible for inclusion you are required to be fluent in either Polish or English.

Why have I been selected?

We have selected you to participate in this study because you work as a doctor in a hospital department where shift handover communication is a routine practice (internal medicine, general surgery, gynaecology, neonatal care, neurology, orthopaedics, renal, urology or obstetrics).

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part you will be asked to provide informed consent. A decision not to take part in or to withdraw (e.g. for example you may wish to terminate the interview), will not affect you in any way.

How do I provide consent to take part in the study?

If you decide to take part in an interview, you will be asked to sign a consent form (if an interview will be conducted face-to-face), or send an email to K.Machaczek@shu.ac.uk (if an interview will be conducted over the telephone).

What will happen to me if I take part?

During the study period you will be asked take part in an interview. The interview may take up to 40 minutes, and will be conducted at time and place most convenient for you. The interview will be digitally recorded.

The interviews will be conducted between June and August 2011.

What are the possible benefits of taking part?

Insights into handover practices we gain during this study may have informed the current handover practices.

Will my taking part in this study be kept confidential?

Yes.

Although the interview will be digitally recorded, any information that you provide will be anonymised so you cannot be recognised from it. The recordings will be kept until interviews have been transcribed and then destroyed. Transcribed interviews will be stored securely in a research office at Sheffield Hallam University for 5 years. Afterwards they will be destroyed too.

Contact for further information

If you require any further information about the study or you wish to make a complaint about the conduct of the research please contact:

Katarzyna Karolina Machaczek
Centre for Health and Social Care Research
Sheffield Hallam University
32 Collegiate Crescent
32 Montgomery House
S10 2 BP

Tel. + 44 (114) 225 5654
Email: K.Machaczek@shu.ac.uk

Thank you for taking your time to read this information sheet



Title of Project: Barriers to effective communication between doctors at shift handover.

Ethics¹³:

Please tick each box below:

1. I confirm that I have read and understand the information sheet for the above project and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason. ☐
3. I agree to take part in the above project. ☐

Name of Participant

Date

Signature

¹³ This study has been granted Ethical Approval from Faculty of Health and Wellbeing Research Ethics Committee and Health and Social Care Research Ethics Review Group

Centre for Health and Social Care Research Faculty of Health and Wellbeing | 32 Montgomery House | 32 Collegiate Crescent | Sheffield | S10 2BP UK Telephone +44 (0) 114 225 5854 | Fax +44 (0) 114 225 4377 chscr@shu.ac.uk | www.shu.ac.uk/chscr

Katarzyna Karolina Machaczek

Principal Investigator

Date

Signature

Copies: Copies: 1 for participant and 1 for principal investigator

An interview schedule

Barriers to Effective Shift Handover Communication Study

[Welcome & Introduce yourself

Introduce the study.

Ask an interviewee to sign a consent form/ consent over the telephone.

Reassure the interviewee that s/he will be guaranteed anonymity.

Ask the interviewee if it is OK with her/him to record the interview and explain what will happen to the recording.

Thank the interviewee for agreeing to participate in the interview].

The purpose of the interview

I would like to talk to you about your experiences and perceptions of barriers to effective communication at shift handover between doctors in your department. By shift handover I mean the process of handing over patient care between you and your colleagues when one shift leaves and the other one arrives (e.g. as the day shift leaves and the night shift arrives).

Interview questions

Discussion of the meaning and purpose of shift handover:

1. What comes to mind when you think of the role of shift handover?

Probes:

- *Ask about any specific issues arising from the discussion*
What things are important in shift handover communication between doctors? Why do you say that?

Discussion of barriers to conducting shift handover:

General and specific barriers:

2. Do you encounter any barriers to conducting shift handover?

Probes:

- What are things that make it difficult for you to communicate effectively during shift handover (if any)?
- *Ask about any specific issues arising from the discussion*
What things may prevent you from transferring clinical information and patient care to other doctors?; Under what circumstances is communication during shift handover challenging? : Why do you say that? How do you feel when it happens?

Barriers identified found in the questionnaire survey:

3. Prior to our discussion, I conducted a survey of 181 doctors, asking them to indicate the main barriers to effective shift handover communication in Czech hospitals. The results revealed the following key barriers:

- (I) Messy; illegible and out-of-date reports;
- (II) Difficulty in communicating with more senior/junior members of staff;
- (III) Poor communication skills (e.g. interrupting and non-listening)
- (IV) Unclear division of responsibility.
- (V) Not enough time; busy periods in the department/hospital; poor workforce planning.
- (VI) Lack of training in how to conduct handover/communicate during shift handover.

Do you encounter similar barriers? *if yes*, could we discuss them one by one?

Probes:

- How can messy records jeopardize shift handover communication? Are there any circumstances in which messy records are not important for the quality of shift handover communication? Why is that?
- How does conducting shift handover/communicating during shift handover with more senior/junior doctors compare with conducting shift handover/communicating during shift handover with peers?; What is difference between communicating at shift handover with peers and with more junior/senior doctors? Why is that?

- General discussion of communication skills and shift handover - likes/dislikes/problems; Comparison of various communication methods (over the telephone, face-to-face, face-to-face + records/checklists; records only); advantages and disadvantages of various methods.
4. Let's return to our earlier discussion about the responses to my previous questionnaire survey; to a lesser extent the respondents (doctors) believed that problems arose through:
- (VII) Interrupting and not listening;
 - (VIII) Difficulty in recognising which information is essential for patient care;
 - (IX) The provision of irrelevant information during shift handover;

Do you encounter similar barriers? Could you tell me a little more about it?

Discussion of methods/strategies of conducting handover:

5. What do you use to conduct handover/communicate during handover?
- Do you use any forms/checklists/electronic records? Any other strategies or techniques?
 - *If participants state that they use more than one method* - How does using this method compare with other methods? Which method do you prefer? Why is that? - likes, dislikes, problems.
 - Do you alter your method of conducting handover? - When, under which circumstances? Why is that?

Discussion of characteristics of effective shift handover:

6. Have you seen/experiences effective shift handover communication?

Probes:

- What things did you like about it?
- Has anyone taught you how to conduct handover/communicate effectively during shift handover?/
How have you learned to conduct handovers?

Summary

7. Is there anything you would like to change to your current shift handover practices?

Probes:

- Anything other doctors might like to change? Why is that?
How would you/they go about it?
- 8. Is there anything else you would like to add about communication between doctors at shift handover that I might have missed?**

CLOSING:

Closing remarks

Eng V Final

1 for researcher to be kept with project

APPENDIX 6.4 THE INITIAL DATA ANALYSIS FRAMEWORK

(1) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE HEALTHCARE SYSTEM INCLUDING A DISRUPTIVE WORKING ENVIRONMENT	
Unclear division of responsibility.	
Not enough time.	
Poor workforce planning.	
Busy periods in the department/hospital.	
Lack of training in how to conduct handover.	
(2) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INDIVIDUAL PERFORMANCE-RELATED BARRIERS	
Messy, illegible and out-of-date records.	
Difficulty in recognising which information is essential for patient care.	
The provision of irrelevant information during shift handover.	
Difficulty in communicating with more senior/junior members of staff.	
Poor communication skills.	
Interrupting and not listening.	

APPENDIX 6.5 THE FINAL DATA ANALYSIS FRAMEWORK

(1) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY THE INADEQUACIES OF THE HEALTHCARE AND MEDICAL EDUCATION SYSTEM, INCLUDING A DISRUPTIVE WORKING ENVIRONMENT
The absence of training in how to conduct handover.
The heterogeneity of handover forms.
Handover is an informal practice.
Doctors hold different perceptions of the importance of handover.
Some doctors believe that handover is unimportant.
The optionality of whether handover takes place or not, left to doctors' discretion.
No handover.
Fear of legal consequences, which seemed to be associated with fear of revealing truth (e.g. adverse event) or uncertainty.
Some doctors preparing excessively comprehensive records.
Information unavailability.
Lack of teaching less experienced doctors during handover; some senior doctors are reluctant to teach junior doctors during handover.
Limited financial resources.
Lack of time.
Lack of a distraction-free handover location.
(2) EFFECTIVE COMMUNICATION BETWEEN DOCTORS AT SHIFT HANDOVER IS HINDERED BY INSUFFICIENT CLINICAL AND COMMUNICATION SKILLS OF DOCTORS
Some doctors do not have skills to elicit essential information for the delivery of a patient's care.
Some doctors do not prioritise essential information to be conveyed to doctors who start their shift at handover.
Some doctors prepare excessively comprehensive records.
(3) EFFECTIVE COMMUNICATION BETWEEN DOCTORS IS HINDERED BY THE SOCIAL CONTEXT OF HANDOVER
Some doctors' professional identities, personalities and attitudes towards work present barriers to effective shift handover communication.
Some doctors provide inaccurate information at handover, consciously or unconsciously.