Transitional Care of the Elderly from a Resilience Perspective

Doctoral Thesis by

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In memory, respect and support of the elderly,

I dedicate this thesis.

May the field of geriatrics be prioritized and valued.

"When you age you sometimes get the impression that you don't matter. However, aging is not equivalent with life somehow being over. An old man can still have very much—even if many people believe otherwise."

(Male patient in the study, 84 years old)

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Stavanger, 2015.

Kristin Alstveit Laugaland

Summary

Major initiatives have been undertaken to understand and improve care transitions, since they increase the likelihood of errors and make patients more vulnerable. The elderly are particularly vulnerable during care transitions owing to the complexity of their treatment. Despite this, relatively little attention has been paid to safety issues affecting the elderly. This thesis focuses on transitional care and more specifically on the hospital discharge of elderly patients to follow-up care in municipal services. The thesis examines and describes this specific care transition using a resilience perspective.

Resilience is an emerging approach for analysing complex systems, such as those associated with transitional care. It highlights the value of studying everyday performance to increase understanding of a system's vulnerabilities and its underlying complexities. The concept of resilience is recognized in healthcare through the term 'resilient healthcare' (RHC). By applying the resilience perspective, this thesis brings a new perspective to bear on the study of transitional care of the elderly.

Five research questions are addressed: (a) What risks are identified in the literature related to transitional care of the elderly? (b) What interventions are identified in the literature to address these risks? (c) What methodological approaches are suitable for providing an increased understanding of transitional care of the elderly? (d) What characterizes hospital discharge of the elderly to follow-up care in municipal services, and why does discharge performance vary? (e) How does the hospital discharge system adapt to its contextual environment, and what are the implications of those adjustments? Each research question is examined and the results presented in five separate papers (Papers I–V).

The overall study design applied in the thesis consisted of two main phases. Phase 1 was a review of the literature and methodological orientation, covering research questions a–c. Phase 2 consisted of a qualitative case study, using observation as the primary research method, supplemented by individual interviews. This empirical phase covered research questions d–e. The empirical study drew in part upon the

Functional Resonance Analysis Method (FRAM), developed within the resilience perspective to analyse performance in complex systems.

The thesis consists of two parts. Part 1 provides an overview and description of the study background, aims, research questions, and theoretical and methodological orientation applied in the thesis. It also includes a discussion of the study findings and concluding remarks on implications and recommendations. Part 2 consists of the five papers examining the research questions.

Paper I reveals that adverse events occur during transitional care and indicates that the elderly are a particularly vulnerable patient group. The type of adverse events reported in the literature are drug-related, procedure-related, diagnostic test follow-up errors, nosocomial infections, and falls. The severity of those adverse events varies from laboratory errors to permanent disability and death. The major contributing risk factors for adverse events cited in the literature are ineffective care processes and poor communication. Paper I concludes that multidisciplinary collaboration and effective communication of information are vital components during transitional care of elderly patients. It also highlights the need for further research.

Paper II identifies a set of potential intervention types designed to address the risks related to transitional care of elderly patients. The intervention types include the following: profession-oriented interventions (e.g., education and training), organisational interventions (e.g., transfer nurse, discharge protocol, discharge planning, medication reconciliation, a standardized discharge letter, and electronic tools), and interventions oriented to the patient and their next of kin (e.g., patient awareness and empowerment, discharge support). The review in Paper II did not find evidence for the validity of one intervention over any other. However, the findings suggested that effects are more apparent in interventions that involve multi-component approaches.

Paper III explains that existing studies on transitional care have primarily employed methods such as individual interviews or focus groups, which examine the experiences of professional groups or stakeholders in isolation. Most studies have looked at the information dynamics and

communication processes. Paper III emphasizes the importance of regarding transitional care and hospital discharge as an integrated whole. It explains the need for methodological approaches that contribute to contextual knowledge and increased understanding. Ethnographic research and observational studies appear to be underrepresented in the literature on care transitions. Paper III emphasizes the uniqueness of the design and methodological approaches applied in this thesis, which involved real-time observations with multiple stakeholder perspectives (patients, next of kin, and healthcare providers).

Paper IV shows the practical application of FRAM to analyse and model the essential characteristics or functions in hospital discharge of the elderly. It demonstrates that hospital discharge is a complex multi-agency care process with multiple activities and numerous goals. Paper IV provides insight into 10 common functions performed during hospital discharge and highlights the function "review of hospital inpatients to determine whether a patient is medically fit for discharge" as one of the most critical. This activates the overall discharge process and affects all subsequent functions by determining when they are initiated. Paper IV thus illustrates the strong degree of interrelatedness that exists between the 10 discharge functions, highlighting variability and vulnerabilities arising out of functional dependencies. The paper also recognizes and examines the ways the 10 functions vary in timing, duration and precision in performance, and provides insights into several performance-shaping factors that can be attributed to a range of contextual features. These performance-shaping factors include temporal conditions (degree of time pressure), individual and team characteristics, patient factors, organizational factors (unit, specialization, leadership, institutionalized routines), work environment factors (bed availability, availability of municipal services, quality of discharge planning, familiarity with the patient, pressure from next of kin) and regulatory influences (financial incentives). The paper shows that hospital discharge performance is highly sensitive to multiple interacting variables and variation in context.

Using the example of the Norwegian Coordination Reform (2012), Paper V illustrates how a system reform can affect hospital discharge performance. It shows how clinical environments adjust their

functioning to new demands and how the outcomes of those adjustments are experienced by patients, next of kin, and hospital and primary care personnel. It also underscores the pertinent characteristics of everyday clinical work, particularly the trade-offs and inherent tensions in hospital discharge of the elderly. The paper shows how the outcome of hospital discharge varies from different perspectives. From a hospital perspective, outcomes of the adjustments imposed by the reform were mainly perceived as successful. Hospital personnel reported improved discharge planning, closer dialogue with primary care, increase in time efficiency on the day of discharge, decrease in delayed discharges and better bed availability. From a primary care perspective, the picture was more nuanced and outcomes were perceived as variable and sometimes problematic. Healthcare providers in primary care described an unpredictable post-discharge period and increased complexity of care patterns following the adjustments of the reform (e.g., increase in number of transitions and increased need for coordination between care sites). From the perspective of patients and their next of kin, the adjustments often had negative effects. The elderly were poorly involved in the discharge planning process and the increase in the number of transitions post-discharge posed mental and physical challenges. Paper V stresses the need for clarification of acceptable successful outcomes and system definitions in relation to hospital discharge.

One of the main strengths of this thesis lies in the application of FRAM to facilitate comprehensive, detailed accounts of the hospital discharge process for the elderly. This extends the usual methodological approaches, which tend to focus on single dimensions. The use of FRAM identified a number of less well-recognized issues that might explain variation in discharge performances and outcomes. It revealed, for example, the strong degree of interrelatedness between discharge functions, highlighting how performance variability may arise from functional interdependencies. These findings imply that the concepts of complex interactions and dependencies should be applied as analytical dimensions when studying transitional care.

In the context of transitional care, we should extend the analysis beyond narrowly-defined clinical microsystems in and across care levels, and include patients and their next of kin in a multi-agency stakeholder

perspective. To incorporate these additional perspectives, the concept of *work as experienced* by patients and next of kin should be introduced to the FRAM terminology. The results of this thesis also show that observational research approaches are powerful ways to understand and describe discharge characteristics and performance variability and should therefore be seen as integral to the FRAM approach. Last, the thesis adds a documented overview of risks involved and available interventions for transitional care of the elderly.

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Part I

1 Introduction

As stated in the title, this thesis concerns transitional care of the elderly from a resilience perspective [1]. I will proceed by providing a brief introduction, explicating the relevance of this topic. I will then present the current status of knowledge in this area as well as the study objectives, research questions, and the context of this study.

1.1 Background

Interest in transitional care [2], which in this thesis includes hospital discharge to follow-up care in municipal services (i.e., transfer from one healthcare setting to another), has received increased attention and concern over the past decade (Manser 2013). This is because it has been found to be a vulnerable and error-prone transition (Forster et al. 2003, Moore et al. 2003, Mesteig et al. 2010). The limited literature in this area suggests that one in five patients experiences an adverse event [3] following hospital discharge (Forster et al. 2003); the outcome has variable gravity (Laugaland et al. 2011). The elderly population has been found to be particularly vulnerable to adverse events (Long et al. 2013, Laugaland et al. 2011, Tsilimingras et al. 2009, Corbett et al. 2010, LaMantia et al. 2010, Hesselink et al. 2012); this is due to the characteristically complex modes of treatment in such patients. With aging, such conditions as dementia, Parkinson's disease, stroke, renal failure, cardiovascular diseases, cancer, metabolism disturbances, and physical illness become prevalent and so does multi-morbidity. Social suffering, isolation, malnutrition, lack of exercise, multiple medication,

[1] Resilience in health care is concerned with the health-care system's ability to adjust its functioning before, during, and after changes and disturbances so that it can provide the necessary performance under both expected and unexpected conditions (Hollnagel et al. 2013).

[2] Transitional care is defined as a set of actions designed to ensure the coordination and continuity of health care as patients transfer between different locations and different levels of care within the same location (Coleman & Boult 2003).

[3] An adverse event is an unintended injury caused by medical management rather than by the disease process (Vincent 2010:53).

and the side effects and interactions among various medicaments can augment this complexity (Vincent 2010). In this complex situation, elderly patients commonly receive care from a number of healthcare providers and move frequently within and among healthcare settings. As a result, a seamless interface between primary and secondary healthcare becomes increasingly important.

In addition to the above considerations, the elderly population is growing rapidly both worldwide and in the case of the focus of the present thesis in Norway (Brunborg 2012, Lancet 2014). This development calls for better-organized, more efficient healthcare services (Report to Parliament no. 47 2008-2009, Hesselink et al. 2012). Promoting healthcare integration (i.e., coordination of care between and within various levels of the healthcare delivery system) has long been a concern and an ongoing challenge (WHO 2008). To overcome and meet these challenges, policy initiatives have been advanced in various countries. In Norway, the Coordination Reform (Report to Parliament no. 47 2008-2009) was implemented in 2012; this aimed to improve coordination among healthcare services, including hospital discharge.

Despite these facts and concerns, relatively little attention has been directed towards patient safety characteristics in the elderly population—even though elderly represent a vulnerable patient group in general and especially during care transitions (Long et al. 2013, Vincent 2010, Tsilimingras et al. 2009, Walker 2007). The elderly are often excluded from research studies (Knechel 2013, Long et al. 2013) since they are thought to be vulnerable, in need of protection (McMurdo et al. 2011), and present methodological challenges (Long et al. 2013).

1.2 Current research

Patient safety[4] research has conventionally focused on adverse events during the provision of services to patients within hospital settings. Less attention has been given to transitions between service levels, the post-

[4] Patient safety can be defined as the 'avoidance, prevention and amelioration of adverse outcomes stemming from the process of healthcare' (Vincent 2006, p 14).

discharge period, and primary care (Tsilimingras & Bates 2008, WHO 2012, Gobel et al. 2012, Jeffs et al. 2013, Enderlin et al. 2013, Cresswell et al. 2013, Hilligoss & Cohen 2013). Research on transitional care and hospital discharge is, however, now progressing in Norway and other countries, and major efforts are being made to understand and improve these transitions.

1.2.1 Knowledge status within transitional care?

Care transitions is widely regarded as difficult processes in the patient journey, with increased opportunity for adverse events that may result in patient harm (Waring et al. 2014). The classic study by Forster and colleagues found that 20% of hospital discharges involve some form of adverse event (Forster et al. 2003). Research highlights a number of common discharge-related risks such as adverse drug events, the provision of inappropriate health and social care, follow-up errors, incomplete tests and scans and the risk of falls and infections (Laugaland et al. 2011, Waring et al. 2014). A recent study assessing the frequency and severity of adverse drug events in the elderly during the post-discharge period identified (in line with Forster et al. 2003) an event in nearly one in five discharges (Kanaan et al. 2013). Research highlights the potential for improvement, as one-third of these adverse events are considered preventable and/or ameliorable (Forster et al. 2003, Kanaan et al. 2013).

Several factors have been found to contribute to adverse events in transitional care including hospital discharge. Based on a literature review, Greenwald et al. (2007) identified three overall types: (1) those related to the characteristics of the hospital care system (e.g., communication breakdowns, inadequate patient education, lack of timely follow-up, lapse in home services); (2) those related to patient characteristics (e.g., condition, language barriers, medication adherence); and (3) those relating to clinician characteristics (e.g., inappropriate discharge, inappropriate medication, inadequate home services). The literature, however, frequently emphasizes communication breakdown as a predominant (system-associated) factor contributing to ineffective and suboptimal discharge outcomes (Laugaland et al. 2011, Waring et al. 2014, Hudson et al. 2014). A

systematic review conducted by Kripalani and colleagues (2007) found that communication between hospital and family doctor was often partial or missing, relying primarily upon discharge summaries, which could be incomplete, lacking in detail or not provided in a timely manner. A deficit in information exchange between nurses has also been linked with low prevalence of discharge notes (Hellesø et al. 2004).

Studies conducted in Norway showed a similar picture. For example, Mesteig et al. (2010) found that nearly 60% of geriatric patients experienced an adverse event after discharge from the hospital. The most frequent were errors relating to drug regimen or information transfer. Garaasen and Johnson (2007) found that discharge letters lacked so much vital medical information that this might cause problems for the elderly. Another recent study, which assessed patient information exchange between nurses in hospital and primary care about older home-living patients, further confirmed the incompleteness in written and verbal information exchange (Olsen et al. 2014).

Consequently, and not surprisingly, effective communication of information has been emphasized as a key characteristic and vital component in care transitions (WHO 2007). Research has therefore primarily focused on understanding and improving communication behaviour (Abraham et al. 2012, Manser & Foster 2011, Manser 2013). Several initiatives and interventions have been suggested to enhance communication and improve transitional care including hospital discharge (Laugaland et al. 2012) but despite advances, current evidence is scant and inconclusive, and progress towards improvement has been limited and slow (LaMantia et al. 2010, Rennke et al. 2013).

1.2.2 Knowledge gaps

The predominant research strategy, which focuses on isolated aspects of care transitions, makes it hard to develop a thorough understanding of the processes involved (Abraham et al. 2012, Manser & Foster 2011, Manser 2013). Studies of hospital discharge have typically focused on risk and single isolated aspects (e.g., adverse drug events, medication reconciliation, discharge planning, or information transfer), and

especially information transfer. Extending the focus of analysis can provide additional information on factors contributing to successful or suboptimal outcomes beyond information transfer (Abraham et al. 2012, Manser 2013, Storm et al. 2014).

Several papers have highlighted hospital discharge as a series of complex and multifactorial care transitions (Jeffcott et al. 2009b, Abraham et al. 2012, Manser 2013, Waring et al. 2014). There does, however, appear to be a scarcity of research on the inherent complexities (Abraham et al. 2012, Manser 2013). Robinson et al. (2012) incorporated a multiple stakeholder perspective and showed that a complex interplay of multiple elements contributed to the success of transitions for the elderly. These elements involved knowing the patient, critical geriatric knowledge and assessment, positive relationships, effective communication and timeliness. Similarly, the study by Storm et al. (2014) showed a complex and interconnected picture of challenges during care transitions for the elderly, including hospital discharge. The study highlighted six main challenges influencing the quality of care transitions. These were: (1) those involving next of kin (managing provider transfers, advocacy, support, information-brokering); (2) patient characteristics (level of satisfaction, level of insecurity, complexity of clinical condition); (3) the competence of healthcare personnel, including their awareness of others' roles); (4) information exchange (oral, written and electronic); (5) context (stability, variability, change incentives, number of patient handovers); and (6) patient assessment (complex clinical picture, patient description, clinical assessment). Considering the multiplicity of challenges identified, Storm et al. (2014) emphasized the need for multiple improvement measures. They suggested that increased competence of healthcare personnel in transitional care practices and inter-organizational staff meetings across units and levels of care might help to address several of the challenges, particularly the competence of healthcare personnel, information exchange, context and patient assessment.

Despite increased efforts, the literature documents major gaps in our understanding of the complex aspects of transitional care and hospital discharge (Robinson et al. 2012, Manser 2013, Hudson et al. 2014, Waring et al. 2014). In particular, there is limited understanding of

interdependencies and performance variations across care levels and providers, and significant contextual factors (Jeffcott et al. 2009b, Abraham et al. 2012, Geary & Schumacher 2012, Hilligoss & Cohen 2013, Shekelle et al. 2011, Storm et al. 2014). More research is therefore needed to explore these aspects, to both increase understanding of patient safety in transitional care and hospital discharge and inform improvement efforts.

Several researchers have advocated the application of complex-adaptive systems theory to transitional care to support a more comprehensive analysis (Tsasis et al. 2012, Edgren & Barnard 2012, McDaniel et al. 2013). Resilience is an emerging approach for analysing complex adaptive systems, such as those associated with care transitions and hospital discharge. It highlights the value of studying everyday performance to increase understanding of system vulnerabilities and underlying complexities (Hollnagel 2012a). Resilience in healthcare focuses on variability and performance-shaping factors. Information about variability in healthcare performance has not commonly been recognized as an asset, and it has rarely been systematically gathered (Rankin et al. 2013). In fact, the influence of performance-shaping factors in healthcare is poorly understood (LeBlanc et al. 2011, Rankin et al. 2013). Promoting safety in hospital discharge requires study of the performance-shaping factors that lead to variations. This requires a thorough understanding of the actual process (Hollnagel 2012a).

This thesis applies the resilience perspective and so presents a new approach to the study of transitional care and more specifically hospital discharge of the elderly.

1.3 Aims and research questions

In light of the knowledge gaps that exist in the literature, this thesis has the goal of exploring and extending current knowledge towards a better understanding of transitional care (including hospital discharge of the elderly to follow-up care in municipal services), its characteristics, variability, and performance-shaping factors. Specifically, by examining transitional care of the elderly, this thesis has two overall aims with related research questions:

1. To document the current knowledge base for risks related to transitional care of the elderly, interventions designed to address those risks, and suitable methodological approaches.

    a) What risks are identified in the literature related to transitional care of the elderly? (Paper I)
    b) What interventions are identified in the literature to address these risks? (Paper II).
    c) What methodological approaches are suitable for providing an increased understanding of transitional care of the elderly? (Paper III).

2. To provide increased understanding of the characteristics of hospital discharge of the elderly to follow-up care in municipal services.

    d) What characterizes hospital discharge of the elderly to follow-up care in municipal services, and why does discharge performance vary? (Paper IV).
    e) How does the hospital discharge system adapt to its contextual environment, and what are the implications of those adjustments? (Paper V).

1.4 Study context

The study for this thesis was conducted in two regions in Norway (one rural and one city). Both regions are located within the same regional health authority. The Norwegian healthcare system is divided into two separate organizational levels—primary care and specialized secondary care. Primary care (general practitioners [GPs], public health nurses, nursing homes, and home care) is managed by local municipalities; specialized healthcare is provided in state-owned hospitals (81 hospitals) and organized by four regional health authorities. The two levels act according to different laws, regulations, goals, and tasks (Ringard et al. 2013).

Many of Norway's 430 municipalities are small in terms of population: approximately half have fewer than 5000 inhabitants (Romøren et al. 2011). Each hospital cooperates with different municipal health services, with the number ranging from two to over 30 (Romøren et al. 2011). Most GPs work in private enterprises under an agreement with their local municipality (Heimly & Hygen 2011). Home-care services are organized in district units. When needed, home-care services may be offered several times a day and at night, and they can even be provided for 24 hours a day for shorter periods.

1.4.1 Political context

As in many other countries, enhancing the coordination between primary and secondary healthcare services has been a challenge for the Norwegian healthcare policy over the past decade (Romøren et al. 2011). The Coordination Reform (Report to Parliament no. 47 2008-2009) was implemented in January 2012, and it had the principal aim of improving coordination among different levels of care and care providers. Key features of the reform are two strategies that have been employed in health systems in other countries: (1) more patients should be treated in primary care rather than in hospitals; (2) discharge from acute-care hospitals should occur earlier to avoid delayed discharge and bed blocking[5]. Several measures have been initiated to achieve this goal in Norway, including legislation, mandatory cooperation agreements between hospitals and municipalities, guidance, and economic instruments.

In Norway, the most important economic instruments are municipal co-financing of specialist healthcare services and municipal financial responsibility for patients ready for discharge. This co-funding includes municipal co-payment of general hospital admissions and a penalty fee for not immediately receiving patients ready for discharge (Romøren et al. 2011). Specifically, payment is required if the municipality does not accept the patient before midnight the day they are deemed ready for

[5] Bed blocking signifies patients occupying beds in specialist care while awaiting municipal services (Majeed et al. 2012). Bed blocking is particularly associated with elderly patients with complex needs (Bryan 2010).

discharge (533 euros per day). The co-funding and penalty fee were enforced in 2012. Hospitals and municipalities are also obliged by government to make legally binding contracts to formalize requirements for the organization of transitional care and the hospital discharge planning process, i.e., tasks, responsibilities, interaction, information transfer, type of information, and deadlines for information exchange (Report to Parliament no. 47 2008-2009).

Another central feature of the Coordination Reform is that electronic communication is regarded as the preferred means for collaboration in the healthcare sector (Report to Parliament no. 47 2008-2009). Electronic information exchange among home-care services, GPs, and hospitals is in an initial phase and operates to various degrees; however, plans call for it to be fully developed in all Norway's hospitals and municipalities (Bergmo et al. 2013).

Reinforcing the role of patients and next of kin has long been a policy priority in Norway. The Coordination Reform (Report to Parliament no. 47 2008-2009, Patient Rights Act 1999) emphasizes the importance of the patient's perspective to ensure continuity and high-quality care.

1.5 Research environment

This PhD study is part of a larger research project entitled 'Quality and Safety in Transitional Care of the Elderly' (2011-2015) (see Paper III). The research project has two main objectives:

1. **To explore** different aspects of transitional care of the elderly (e.g., coordination, multi-professional collaboration, patient participation) in different contexts (e.g., admission or discharge, densely or sparsely populated geographical areas) and examine how they might explain the quality and safety of care (Phase 1).

2. **To design and test** an evidence-based intervention program to assess the impact of transitional care on quality and safety

and to implement improvements in the transitional care of elderly patients (Phase 2).

This PhD study is part of objective 1 with a specific focus on hospital discharge of elderly patients to follow-up care in municipal services. The core research team in that larger project consists of two PhD students, one postdoctoral candidate, a project manager, and six master's students. Several collaborating partners are involved in this project: the University of Stavanger (project owner); the Regional Centre for Age-Related Medicine, Stavanger; the Health Trust Førde; and an international expert advisory group with members from England and Denmark. This PhD study is funded by the Western Regional Health Authority in Norway (grant agreement no. 911642).

Meetings with the expert advisory group provided valuable input for this PhD study, and they gave me the opportunity to meet researchers at the forefront of transitional care in various fields of expertise. I also found that being part of a research team, with continuous discussion and collaboration on research publications, to be inspiring and motivating, and it broadened my perspectives. In 2013, I was a visiting scholar at the University of Nottingham at the invitation of Professor Justin Waring (co-supervisor). Professor Waring is leading a project in England that has similarities with our Norwegian research project, providing opportunities for future collaboration and cross-country analysis.

I did the work on my PhD from my office at the University of Stavanger. Along with 20 other active affiliated researchers, I am a member of the Quality and Safety in Healthcare Systems research programme. The research group consists of professional researchers in various fields (safety science, medicine, nursing, engineering, sociology, psychology), who study quality and safety from a multi-level perspective.

1.6 Structure of the thesis

This thesis is divided into two main parts. Part 1 includes the overall framework for the five papers, and it consists of six chapters. Chapter 1 introduces the relevance of transitional care of the elderly along with the

study objectives and context. Chapter 2 presents the theoretical framework, and this is followed by the methodological approach and choice of study design in Chapter 3. The main results are briefly summarized in Chapter 4. Chapter 5 discusses the important implications of this thesis. Conclusions are given in Chapter 6. Part 2 consists of the following five papers upon which this thesis is based:

I. Laugaland, K., Aase, K. & Barach, P. (2011). Addressing risk factors for transitional care of the elderly—Literature review. In Albolini, S., Bagnare, S., Bellani, T., Llaneza, J., Rosal, G. & Tartaglia, R. (Eds.). *Healthcare Systems Ergonomics and Patient safety 2011—An alliance between Professionals and Citizens for Patient Safety and Quality of Life*. CRC Press, Taylor & Francis Group, London, UK. ISBN: 978-0-415-68413-2.

II. Laugaland, K., Aase, K. & Barach, P. (2012). Interventions to Improve Patient Safety in Transitional Care—A Review of the Evidence. *Work, A Journal of Prevention, Assessment and Rehabilitation*, Vol. 41, Supplement 1/2012, pp. 2915-2924

III. Karina Aase, Kristin Alstveit Laugaland, Dagrunn Nåden Dyrstad & Marianne Storm (2013). Quality and Safety in Transitional Care of the Elderly: the study protocol of a case study research design (phase 1). *BMJ Open*. Vol. 3.

IV. Kristin Laugaland, Karina Aase & Justin Waring. (2014) Hospital discharge of the elderly—an observational case study of functions, variability and performance shaping factors. *BMC Health Services Research*, 14:365.

V. Kristin Laugaland & Karina Aase (2015). The demands imposed by a health care reform on clinical work in transitional care of the elderly: A multi-faceted Janus. In Wears R, Hollnagel E, Braithwaite J. *Resilience in everyday clinical work*. Ashgate.

2 Theory

This chapter presents first a brief introduction to the concept of resilience and the development of resilience engineering as a notion within safety science. The chapter continues with a description of resilience engineering, on which resilience in healthcare is based. This section is followed by a description of resilience in healthcare, including its definition and the characteristics that have guided the research process. The chapter ends with a description of the Functional Resonance Analysis Method (FRAM) (Hollnagel 2012a), which was developed with the resilience perspective to analyse complex systems and describe performance. The resilience perspective and FRAM has been applied in the empirical parts (phase 2) of the thesis.

Resilience is founded on many of the same aspects addressed by other perspectives of system safety, such as High Reliability Theory. However, it has been argued that resilience fits the complexity of healthcare more effectively than principles offered by other perspectives; this is because resilience more successfully addresses the unique complexities of healthcare (Jeffcott et al. 2009a). Resilience also adopts adaptation as a normal state of practice (Rossness et al. 2010). Compared with other perspectives, resilience engineering places greater emphasis on adaptation, and it addresses the need for organizations to adjust to change since performance conditions are often unspecified and unpredictable. By contrast, reliability in high reliable organisations (HROs) is often achieved by standardization (Nemeth & Cook 2007). HROs are preoccupied with the possibility of failure rather than success, and they search for lapses and errors (Hopkins 2007, Chassin & Loeb 2013). Resilience focuses more on everyday clinical work and what happens regularly in order to identify system vulnerabilities (Hollnagel 2012a).

2.1 Resilience

Resilience has become a fashionable buzzword in recent years, and the term is applied in many different discourses, diverse areas, and such

fields as engineering, biology, and psychology (Boin et al. 2010, Anderson et al. 2013a). Resilience in general is thus a semantically overloaded concept that can mean somewhat different things in different fields (Mandi & Jackson 2009). The common feature of the concept across disciplines is that resilience refers to the ability of a material, person, or biotype to survive sudden shocks (Boin et al. 2010).

The concept of resilience has also emerged and been applied within the field of safety science. The term 'resilience engineering' was developed among a group of researchers in 2004 to address safety concerns that arise from the use of increasingly complex systems with interacting social, technical, financial, and environmental facets (Hollnagel et al. 2010, Hopkins 2014). Resilience engineering thus arose as a new discipline within systems and safety engineering (Mandi & Jackson 2009). Resilience engineering has primarily been applied in such fields as air traffic management, nuclear power generation, offshore production, and accident investigations. It has been only recently that the concept has developed within healthcare under the term 'resilient healthcare' (RHC). RHC is the application of the concepts and methods of resilience engineering to the field of healthcare, particularly to issues of patient safety (Hollnagel et al. 2013). It has been suggested that RHC represents a complementary way of thinking about systems and patient safety—one that emphasizes a proactive systems approach (Jeffcott et al. 2009a, Hollnagel 2013b, Ross & Anderson 2015).

Efforts to improve the safety of systems, including those in healthcare, have thus far primarily been dominated by hindsight—both in research and in practice (Hollnagel & Woods 2006, Waterson 2009, Hollnagel et al. 2013, Anderson et al. 2013a, Waring 2013). The conventional procedure has entailed a reactive approach, in which adverse events are investigated to identify cause-effect relations and develop solutions (Hollnagel 2013b). Thus, adjustments are instituted when unacceptable outcomes have occurred (Hollnagel 2012a, Ross & Anderson 2015). With this approach, safety is defined by what it is not—by what happens when it is absent—rather than by what it is (Hollnagel 2013b). The preoccupation with failure impedes a broader, more dynamic perspective, which is needed to enhance safety (Sheps & Cardiff 2013). Resilience focuses on what we can learn from everyday clinical work

rather than a reactive search for causes (Hollnagel et al. 2013, Ross & Anderson 2015).

2.2 Resilience engineering

Resilience engineering (RE) stresses the value of studying and learning from everyday performance variability as a normal and necessary part of clinical work (Hollnagel 2012a). It is further asserted that such variability is systematic rather than random; hence, it is predictable and allows safety analysis to be based on the existence or presence of variability (Hollnagel 2012a). From this perspective, variability is not necessarily seen as problematic or error inducing, but as affording organizations the ability to cope with unpredictable and unstable working environments. RE thus emphasizes the positive roles that people can play in complex systems. In RE, success (things that go right) and failures (things that go wrong) are regarded as having the same basis—performance variability. RE examines overall performance rather than just failures, and it stresses that we should try to better understand the sources of performance rather than just the sources of failure (Hollnagel 2009b). RE defines safety as the ability to succeed under varying conditions. From this perspective, safety is achieved by adapting to changing circumstances, and it is thus viewed as an emergent property of a system. Variability in performance relative to a situation is seen as essential for safety (Borys et al. 2009).

Adaptive capacity is a central aspect of resilience; it refers to the capability of a particular system to cope effectively with changes (Martin-Breen & Anderies 2011). Adaptations are adjustments in the face of change. They may be positive, negative, or neutral. Adaptations can change systems continuously. If several changes are implemented simultaneously, it may be difficult for people operating within a system to recognize the potential impact that such changes have on the system as a whole. Thus, to monitor and learn from the gap between work as conceived and work as actually practised is a fundamental part of RE (Hollnagel & Woods 2006).

Dekker (2006) argues that one must be aware of the potential gap between a system as conceived and the system as it actually operates. One reason for the widening of this gap is the phenomenon known as practical drift. Practical drift refers to a situation where over time, local work practices move away from the original intent at the time of system design towards more locally efficient work practices (Borys et al. 2009). It is important that this potential gap become visible since this will provide the basis for appropriate learning and adaptation. Dekker (2006) implies that a mismatch between a system as designed and the system as actually operated may be an important factor in the drift towards failure. One potential contribution with the resilience perspective would be to help organizations detect this drift (Dekker 2006).

Resilience is defined as the ability to efficiently adjust functioning prior to, during, or following changes and disturbances; in this way, it is possible to continue to perform as required after the disruption of a major mishap and in the presence of continuous stresses (Hollnagel 2009a:117). This definition implies four key elements of resilience, which represent essential system capabilities (Hollnagel 2009a):

- *Knowing what to do*. This means knowing how to respond to regular and irregular disruptions and disturbances by adjusting normal functioning so that it better matches the new conditions. The response or adjustments have to be effective so as to lead to a desired change. This ability requires that the system needs to be able to detect disruptions. The system also has to recognize or rate the disruption as being sufficiently serious for adjustments to be necessary.

- *Knowing what to look for*. This signifies knowing how to monitor possible threats. A resilient system needs to be capable of monitoring its own practices. The monitoring has to cover both the environment and the system itself, i.e., its own performance.

- *Knowing what to expect.* This means knowing how to anticipate future developments and threats, such as potential disruptions, pressures, and their consequences. Foreseeing

these potential problems is difficult because it requires imagination. It can also be costly since it deals with matters where the benefits are uncertain. Relatively few organizations therefore allocate sufficient resources to anticipating potential problems.

- *Knowing what has happened*. This signifies knowing how to learn from experience, and it involves the ability to process information. This ability is a precondition for being able to respond, monitor, and look ahead. The effectiveness of learning depends on the basis for learning, the events or experiences taken into account, and how they are analysed and understood.

The above four capabilities are equally important, interrelated, interdependent, and essential for proactive safety work (Hollnagel 2012b). Resilience consists of the ways in which these four capabilities can be established and managed (Hollnagel 2009a). In short, a resilient system attempts to understand how it functions, not just how it fails. RE establishes the dependencies among a system's functions and the typical variability of those functions. Finally, a resilient system focuses on learning from everyday situations and not just situations where something has gone wrong (Hollnagel 2009a).

2.3 Resilient healthcare

The relationship between complexity and safety is a central focus of RE (Hollnagel et al. 2013), and thus RE is particularly suitable for healthcare. Healthcare is diverse, multi-contextual, and multidisciplinary (Manser 2009, Vincent 2010, Walter et al. 2013). The complexity of healthcare is augmented by the nature of patients, who may increase or decrease their own safety and may be vulnerable to pre-existing conditions or new conditions under which they seek treatment (Runciman et al. 2007, Vincent 2010, Baxter 2010, Hollnagel et al. 2013). In healthcare, the conditions and context may change quickly, and demands and resources are often unpredictable (Hollnagel 2012a).

Healthcare is thus best described as a complex adaptive system (CAS) (Matlow et al. 2006, Barach & Johnson 2006, Raisio 2009, Jeffs et al. 2009, Geary & Schumacher 2012, Robson 2013, Braithwaite et al. 2013); however, this has so far attracted little empirical research (Robson 2013, Ekstedt & Cook 2015). Many healthcare systems consist of multiple interacting stakeholders in a dynamic relationship with one another. Within a healthcare system, there are many types of sub systems, such as hospital wards, specialized units, hospitals, primary-care institutions, and home healthcare; each of them interacting with the larger complex system (Geary & Schumacher 2012). However, it is important to emphasize that a CAS is a system in itself, whereas resilience represents a property of a system: resilience is thus not necessarily bound to a CAS (Martin-Breen & Anderies 2011).

Resilient Healthcare (RHC) monitors the pressures daily operating on healthcare organizations and practitioners, and it requires that they make trade-offs between long- and short-term goals. With RHC, the greater need for efficiency coupled with adaptation to change creates the necessity of sacrifice towards achieving the twin goals of efficiency and thoroughness. Sacrifice here signifies coping with a complex environment (Hollnagel 2009b). Hollnagel (2009b) introduced the Efficiency-Thoroughness Trade-Off (ETTO) principle to explain how control can be maintained in a changing environment. The ETTO principle elucidates how personnel adjust their normal work to match the current conditions by means of an ETTO (Hollnagel 2009b). In this way, personnel frequently or always have to make trade-offs between resources (time, effort) spent on preparing an activity and resources spent on performing the activity.

RHC is based on the concepts related to RE. RHC is thus defined as 'the ability of the healthcare system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required performance under both expected and unexpected conditions' (Hollnagel et al. 2013:xxv). The key point in this definition is the ability of a system to adjust its functioning. This adjustment can take place either after something has happened (reactive) or before it occurs (proactive). RHC denotes the ability of the healthcare system to continue working despite adverse conditions and unexpected events. However, doing so requires

the abilities to respond to events, monitor ongoing developments, anticipate future threats and opportunities, and learn from past failures and successes alike: all of these represent the four key elements or capabilities of resilience (Hollnagel 2009a). The necessity of adaptive capacity in healthcare may be assumed to increase in conjunction with an aging population, advances in personalized medicine, decreased hospitalisation, reduced hospital stays, and rapid discharge of patients (Amalberti 2013).

Adaptations can change the healthcare system in a continuous manner. If several changes are introduced simultaneously, it may be difficult for healthcare providers to recognize the potential impact of the changes on the system. Regulators also tend to have confidence and belief in a system to operate as planned (Fujita 2006). Progress in safety work depends on anticipating how changes will create new vulnerabilities—even if they provide benefits in other areas (Woods & Cook 2001). Progress in safety therefore ultimately depends on giving healthcare providers and managers information about changing vulnerabilities and the ability to develop means to address them.

Striving for RHC demands a proper understanding of everyday activities. RHC thus demands studying and understanding how a system actually works, how its environment changes and develops, and how the system's functions depend on and affect one another. Such understanding can be acquired by looking for patterns and relationships among events rather than the causes of individual events (Hollnagel 2013b).

2.4 Methodological approaches

Since RE and RHC are relatively recent theoretical concepts (Hollnagel et al. 2013), developing methods and tools to apply within this paradigm is at an early stage, and it has not yet been fully developed for specific domains, such as healthcare (Jeffcott et al. 2009a). Although the epistemological basis is well developed, the practical means of building resilient organizations is not (Anderson et al. 2013a). This raises several research challenges, which involve dealing with such questions as the following: How can resilient systems be identified? What are their

characteristics? How can resilient systems be recognized and studied? (Boin et al. 2010).

Resilience is based on the premise that it is not possible to understand any phenomenon without reference to the context in which it occurs. For a system to be understandable, it is therefore necessary to know what goes on within it and to have a sufficiently clear description or specification of the system and its functions. The same requirements have to be met for that system to be analysed and for its risks to be assessed (Hollnagel 2012a). Thus, researching resilience involves observing work as it is conducted (Jeffcott et al. 2009a). Observing performance and adaptations is viewed as critical towards identifying system resilience (Hollnagel 2012a, Rankin et al. 2013). Only through observations can one study how practice copes with hazards and resolves trade-offs—and why for the most part practice succeeds, though in some situations it fails. Based on direct observations, researchers can identify negative or unintended side effects of change (Patterson et al. 2004).

Resilience begins with a description of characteristic functions, and it then looks for ways to enhance a system's ability to respond, monitor, learn, and anticipate (Hollnagel 2012a). Hollnagel (2012a) has suggested that the FRAM, developed within the RE perspective, provides a practical approach to describing and analysing performance variability in CASs.

2.5 Functional Resonance Analysis Method

FRAM approaches a system from a functional perspective: it defines complex systems by the functions they perform rather than in terms of how they are structured (i.e., what the components are and how they are put together). A function refers to the activities or set of activities that are required to produce a certain outcome. A function describes what people individually or collectively have to do to achieve a specific aim (Hollnagel 2012a). FRAM is a method and not a model; the purpose with the FRAM is to build a model of how things occur rather than to interpret what happens in terms of a model. FRAM is based on four principles (Hollnagel 2012a):

First, the principle of equivalence of failures and successes is founded on the concept that they have the same origin. It maintains that things go right or wrong for the same reasons.

Second, the principle of approximate adjustments is based on the notion that many socio-technical systems are intractable: the conditions of work never completely match what was previously specified or prescribed. Hence, work situations are partly unpredictable. To correspond with the actual work conditions and to achieve multiple, conflicting goals, it is normal and necessary for short- and longer-term performance variability to be undertaken. This performance variability signifies adjustments in terms of ETTOs.

Third, the principle of emergence derives from the notion that both failures and satisfactory performance are emergent rather than resultant phenomena; this is because neither can be attributed to or explained by referring only to the function or malfunction of specific components or parts. One function is rarely sufficient to result in an accident. However, variability in multiple functions may combine in unexpected ways, leading to undesired consequences.

Fourth, the principle of functional resonance states that the relations and dependencies among the functions of a system have to be described as they develop in specific situations rather that as predetermined case-effect links. The variability with a number of functions may have compound effects and exceed acceptable limits, thereby leading to an adverse event.

Based on these four principles, FRAM explains outcomes in terms of how functions are connected and how everyday performance variability may have unforeseen effects. From the FRAM perspective, a system is conceived as a set of coupled or mutually dependent functions (Hollnagel 2012a). FRAM proposes that everyday events and activities can be described in terms of the functions involved, without predefining specific functions or assuming they are organized in a specific way. FRAM is thus a method that produces a model, rather than a model being used to produce a method. FRAM does not refer to a model; it makes no assumptions about how a system under investigation is structured or

organized, nor about possible causes or cause-effect relations. With the FRAM, there is no implication that events occur in a specific way or that any predefined components, entities, or relations need be examined. Instead, it focuses on describing what happens in terms of the functions involved—a description of the work as actually performed rather than as conceived (Hollnagel 2012a). FRAM further proposes that functions can be characterized using the six aspects illustrated in Figure 1: input, output, resources, time, control, and preconditions (Hollnagel 2012a).

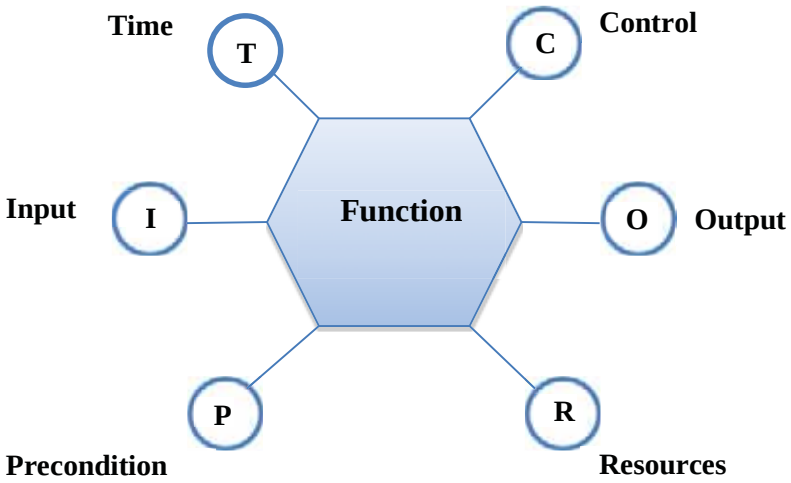

Figure 1: Function characteristics

The *input* can be matter, energy, or information. All inputs must have an origin or source, which means that an input to one function must be the output from another function. The input serves as a signal that a function can begin.

The result of the function, the *output*, can be matter, energy, or information, e.g., a decision, or command issued. The output clarifies how variability can propagate through a system. If a function varies, the output will also vary in some way.

The *preconditions* are conditions that need to be verified before a function is implemented. In many cases, a function cannot begin before one or more preconditions has been established.

Resources are what is needed or consumed when a function is implemented; they can be matter, energy, competence, information, software, tools, or manpower.

Control supervises or regulates the function to ensure that it produces the desired output; it may consist of plans, schedules, procedures, guidelines, or instructions.

The *time* aspect signifies the various ways in which time can affect performance. One function may have to be implemented and completed before another function can be carried out.

FRAM does not preclude the possibility of a different set of aspects being of importance. Functions are not defined a priori; they are not necessarily ordered in a predefined way, such as in a hierarchy. Functions are described individually, and the relations among them are defined by empirically established functional dependencies, rather than by the assumptions of an underlying model (Hollnagel 2012a). According to FRAM (Hollnagel 2012a), it is not necessary to provide a description of all aspects of a function—just focus on the most essential.

The primary purpose of FRAM is to construct a model of the functions of a system that describes how performance variability may occur in everyday practice and how the effects may spread through the system. The resulting knowledge then provides the basis for identifying potential problem areas in the system's functioning (Hollnagel 2012a). In principle, there are three main purposes for which a model of a system developed using FRAM can be employed (Hollnagel 2012a):

- for retrospective analysis,
- for prospective analysis, or
- as a basis for system design or redesign.

FRAM has previously been applied in several domains, such as, management of air (Hollnagel et al. 2008, De Carvalho 2011) and rail traffic (Belmonte et al. 2011), nuclear power (Hollnagel & Nygren 2006), and to some extent within healthcare (Alm & Woltjer 2009, Viskum 2012). Most commonly FRAM has been applied for accident investigation purposes (Frost & Mo 2014). It has been asserted that this methodology provides a complementary insight into system complexity, variability, interactions, and contextual factors (Alm & Woltjer 2009, Sujan & Felici 2012, Hollnagel et al. 2008). FRAM thus provides a more detailed and nuanced understanding of everyday practices (Nemeth 2013).

As applied in this thesis, FRAM can be divided into two major steps: (1) identification and description of functions regarded as relevant for hospital discharge; (2) analysis of variability and performance-shaping factors that contribute to variability in discharge practices. Thus, FRAM is primarily used to describe how the hospital discharge system works, thereby providing insight into the factors that can explain variability in performance and outcome.

2.6 Why FRAM?

FRAM was chosen as the overarching approach for the empirical analysis in this study because:

- It provides a holistic approach for analysing complex systems and exploring interdependencies.
- It focuses on determining the likelihood of functional variability rather than the probability of malfunction or failure.
- It is a novel method developed within the resilience perspective, and has not been widely applied in healthcare, which allows testing of its fit with the complexity found there.

This study is based on the idea that care transitions and hospital discharge is best described as a complex adaptive system. RHC and FRAM offer an approach for the study of these systems (Waring et al. 2014), characterized by non-linear interactive components, emergent issues,

continuous and discontinuous change, and unpredictable outcomes (Zimmerman et al. 1998). Hospital discharge requires the coordination of multiple disciplines and interaction among different actors, including patients, and relatives, both within and between multiple systems (Anderson et al. 2005). This study therefore departs from the usual reductionism that breaks down hospital discharge. FRAM extends the established approaches to support a more comprehensive and detailed analysis, which so far has been limited in healthcare (Robson 2013).

FRAM also differs in concept from more established methods within the field of safety, in that it focuses on determining the likelihood of functional variability, rather than the probability of malfunction or failure. Rasmussen's dynamic model of migration (Rasmussen 1997, Cook & Rasmussen 2005) also replaces the idea of error and failure with that of variability and adaptation, addressing the dynamic aspect of safety. Rasmussen's model contributes to a shift away from the "human error" perspective. Unlike the migration model, FRAM produces a model to describe what happens in terms of the functions involved and their interdependencies (Hollnagel 2012a).

FRAM is also a relatively novel and innovative method specifically developed within the resilience perspective. To our knowledge, it has not previously been applied to the analysis of hospital discharge systems. This study therefore explores how FRAM can advance understanding of this care transition.

3 Methodology

In this chapter, the choice of study design will be presented, including the rationale for selection of methods, setting, participants, and inclusion criteria. The chapter also presents a comprehensive description of the data collection process, including recruitment, data collection tools, and procedures. That section is followed by a presentation of data analysis. Trustworthiness of the research is discussed based on the quality criteria of Lincoln and Guba (1985). This chapter concludes with a reflection of ethical considerations, and methodological reflections including study limitations, strengths, and possible alternative approaches.

3.1 Study design

Given the lack of studies into transitional care, especially in the context of the elderly, and the nature of the research questions presented in Section 1.3, the study design is primarily explorative and descriptive as well as being to some extent explanatory. 'What' questions are directed towards discovering and describing the characteristics of and patterns in some social phenomena (Blaikie 2010). The limited knowledge base with transitional care and more specifically hospital discharge demands exploratory research to first describe and understand the setting and the basic issues. The ultimate purpose of this research is an in-depth understanding of hospital discharge of elderly patients to follow- up care in municipal services, which requires comprehensive data collection. Descriptive research entails providing a detailed account of the phenomenon under examination and its characteristics, patterns, relationships, and regularities (Blaikie 2010). Descriptions of what occurs during hospital discharge will lead to questions about why what occurs does occur. That in turn will call for an explanation towards achieving some kind of understanding, which is often regarded as the ultimate goal in research. 'Why' questions concern either the causes of or reasons for the existence of characteristics or regularities in a particular phenomenon (Blaikie 2010). However, without adequate examination and description, there may be nothing to explain (Blaikie 2010). 'How' questions are thus concerned with change and outcomes,

which in the setting of this thesis are highly relevant owing to the implementation of the Coordination Reform, which introduced changes to the functioning of discharge systems in Norway.

The study design in this thesis consists of two main phases, as illustrated in Figure 2. Phase 1 involves a review of the literature and covers study objective number 1 and research questions (a, b, c) (see Section 1.3). The outcome of the literature review supports and provides the focus for the empirical study conducted in Phase 2. Phase 2 covers study objective number 2 and research questions (d, e) (see Section 1.3). Phase 2 consists of a qualitative case study, and it employs observations as the primary research method supplemented by individual interviews. These two phases will be presented in the following sections.

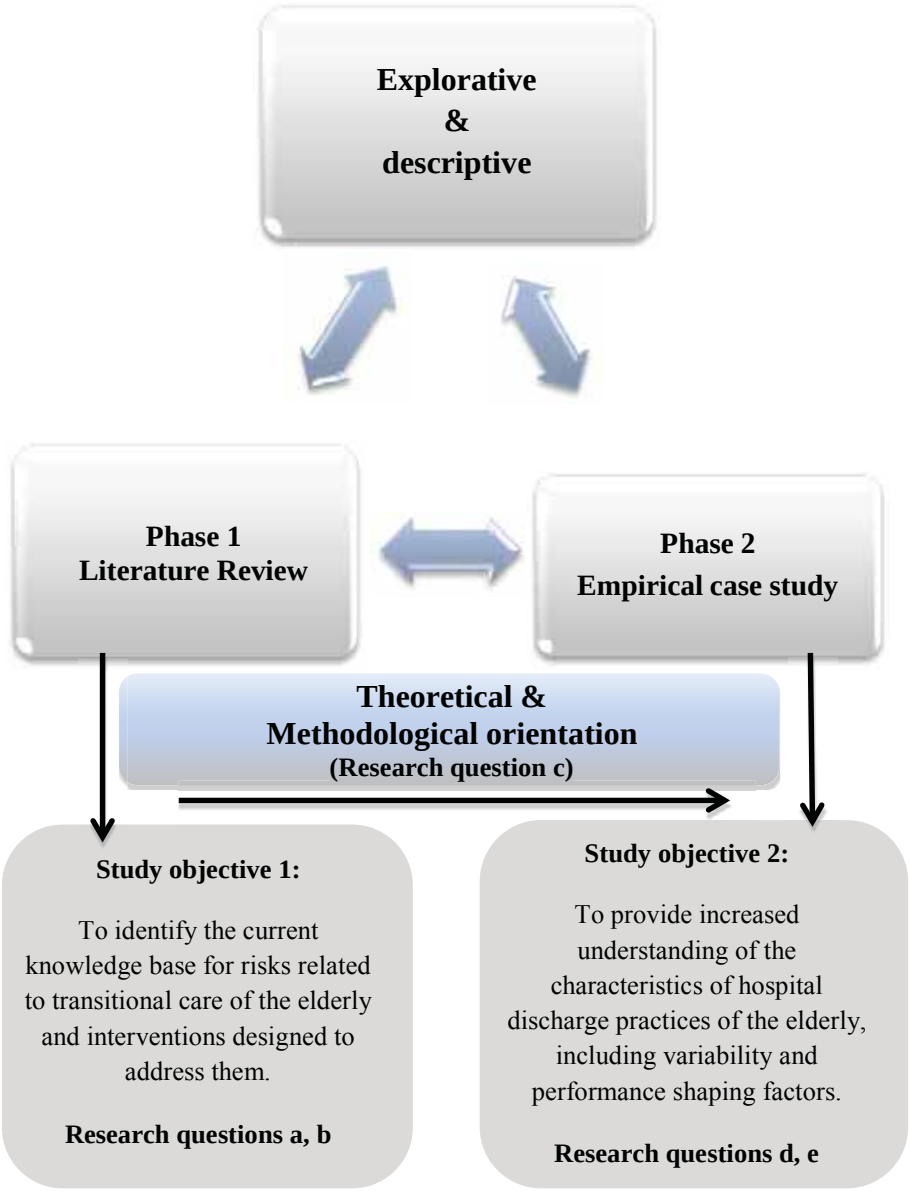

Figure 2: Study design

3.2 Literature review (Phase 1)

Phase 1 involved a review of the literature, which is considered a precondition for thorough research (Bote & Beile 2005). The review of the literature served three main purposes:

1. To provide background information about the area under investigation and establish the rationale for conducting the study (i.e., transitional care and hospital discharge of the elderly).
2. To identify the current state of knowledge so as to reduce any replication of earlier studies and identify knowledge gaps towards providing the focus for the empirical study (Phase 2).
3. To provide theoretical and methodological orientation for the thesis.

To advance insight and understanding in a research area, it is important to know what work has been conducted previously. It is necessary to learn from and build on earlier studies and identify what remains to be investigated, what questions are unanswered, and the concepts that are emergent or under debate. A literature review sets the broad context of the research endeavour and helps justify the decisions made. Research questions (a) and (b) outlined in Section 1.3 guided the review of earlier research (Blaikie 2010); they provided a focus for mapping the identified adverse events related to transitional care of the elderly with belonging interventions to address them.

The literature reviews (Papers I and II) incorporated several different research procedures and methodologies, both qualitative and quantitative, to examine research evidence (Flemming 2009). Both reviews therefore applied an integrative method. An integrative review differs from a systematic one in that it allows inclusion of several methodologies and can take into account a broader range of studies to develop a more comprehensive understanding of a phenomenon (Whittermore & Knafl 2005). This approach contrasts with the view that different types of evidence (quantitative and qualitative) are mutually exclusive. The integrative review process includes (1) problem formulation/review purpose, (2) literature search, (3) data evaluation, (4) data analysis and (5) presentation of results (Whittermore & Knafl 2005).

Papers I and II reports on the review purpose and the literature search stage, including search terms, the databases used, additional search strategies and the inclusion criteria for determining relevant primary sources. The analytic approach applied is not included in the papers. Strategies for data analysis, synthesis and conclusion-drawing in integrative reviews are not well developed, because of the inherent complexity in combining methodologies (Whittermore & Knafl 2005). Research questions (a) and (b) (see section 1.3) facilitated the analysis and extraction of data from the primary sources included in the reviews. An overall classification system for managing data was applied to facilitate the analysis of specific issues, variables or sample characteristics (Whittermore & Knafl 2005). In Paper I, the classification was based on risk factors (e.g., occurrence of adverse events, types of adverse events, severity and contributing factors), looking for recurring themes and issues in the primary literature. The synthesis of the evidence related to the risk factors identified in transitional care is shown in Figure 1 in Paper I. In Paper II, the classification was based on identification of types of interventions, outcome measures applied and effects. A synthesis of the evidence of features of successful interventions is shown in Figure 2 in Paper II. Both reviews are based on a descriptive synthesis of the findings in the primary literature, developed using a textual approach (Ring et al. 2011).

The literature reviews formed the foundation for the theoretical and methodological orientation (Paper III) applied in this thesis (Bote & Beile 2005) based on the main outcomes identified in paper I and II.

Main empirical outcomes:

- Adverse events occur in transitional care of the elderly, characterized as a vulnerable group.
- Major contributing risk factors for adverse events are ineffective care processes and poor communication across care givers.
- Interventions have been designed to improve transitional care of the elderly but current evidence is scant and inconclusive.
- Few studies have examined the context of transitional care of the elderly and the contextual factors influencing performance.

Main methodological outcomes:

- Most studies on transitional care have employed methods such as individual or focus-group interviews; while methods involving real-time observations have received less attention.
- Few studies have undertaken a multidisciplinary approach involving several stakeholders.
- Previous research have been preoccupied with examining adverse events and poor clinical outcomes.
- Most studies have dealt with particular isolated aspects, e.g., information transfer, discharge planning, patient participation, and medication reconciliation. There is a particular emphasis on communication processes. It has been stressed that research needs to focus on determining the functions of transitional care other than information exchange.
- Limited attention has been paid to the organization of hospital discharge as well as its interdependencies and significant contextual factors.

This thesis thus seeks to address the knowledge gap identified in the literature by means of an empirical case study.

3.3 Empirical case study (Phase 2)

The empirical phase employed the research strategy of a case study (Yin 2014). The case study approach offers a theoretically informed and grounded approach for examining, describing, and explaining local systems and organizational processes that incorporate contextual conditions (Yin 2014). The case study strategy allowed me to study hospital discharge of the elderly as an integrated whole within its everyday context, incorporating several stakeholders. It thus represents a powerful approach for extending current knowledge and deepening understanding (Anderson et al. 2005). Resilience in healthcare is also based on the premise that it is not possible to understand any phenomenon without reference to its context (Hollnagel 2012a).

Yin (2014) states that organizational case studies are the preferred research strategy in a complex, dynamic context where it is difficult to isolate variables or where there are strong interactions among them. Hospital discharge of the elderly occurs in an environment with complex interactions among multiple stakeholders in various settings; thus, a case study research design seems particularly appropriate. Case studies are also well suited for generating theories based on empirical data that involve cross-case comparisons towards achieving an overall understanding (Eisenhardt & Graebner 2007). Even though case studies are primarily designed to describe the uniqueness of each case, this strategy is apposite for investigating multiple generic patterns (Anderson et al. 2005). Comparison within and among cases provides a basis for theoretical elaboration and tentative generalization.

It is necessary to clarify the method of case sampling adopted in this thesis and how this thesis is positioned within the larger research project. The overall research project, 'Quality and Safety in Transitional Care of the Elderly', focuses on two settings (i.e., cases) that were chosen based on a most dissimilar strategy (Aase et al. 2013). Each of these settings (i.e., cases) consisted of one hospital along with its associated nursing homes and home-based nursing services:

- **Case A** is a small rural hospital (approximately 2000 employees) and three relatively small rural nursing homes with associated home-care services in three municipalities (approximately 3000 inhabitants).

- **Case B** is a relatively large city-based university hospital (approximately 7000 employees) and several city-based nursing homes and home-care services in one relatively large municipality (approximately 130,000 inhabitants).

Both cases are located in the same regional health authority in Norway. Figure 3 illustrates the case sampling in the overall research project. A multiple case sampling strategy was applied for both Cases A and B (Miles & Huberman 1994) in accordance with the notion of an embedded case study design (Yin 2014). An embedded case study design signifies that single cases (Cases A and B) potentially involve several units and

subunits of analysis. The overall research project covered two types of transitions. The transitions included were acute admission of the elderly to hospital from the municipality (nursing home or home-care service) and discharge from the hospital to nursing home or home with home-based care services (see study protocol, Paper III). The empirical part (phase 2) of this thesis examines hospital discharge of the elderly to follow-up care in municipal healthcare services.

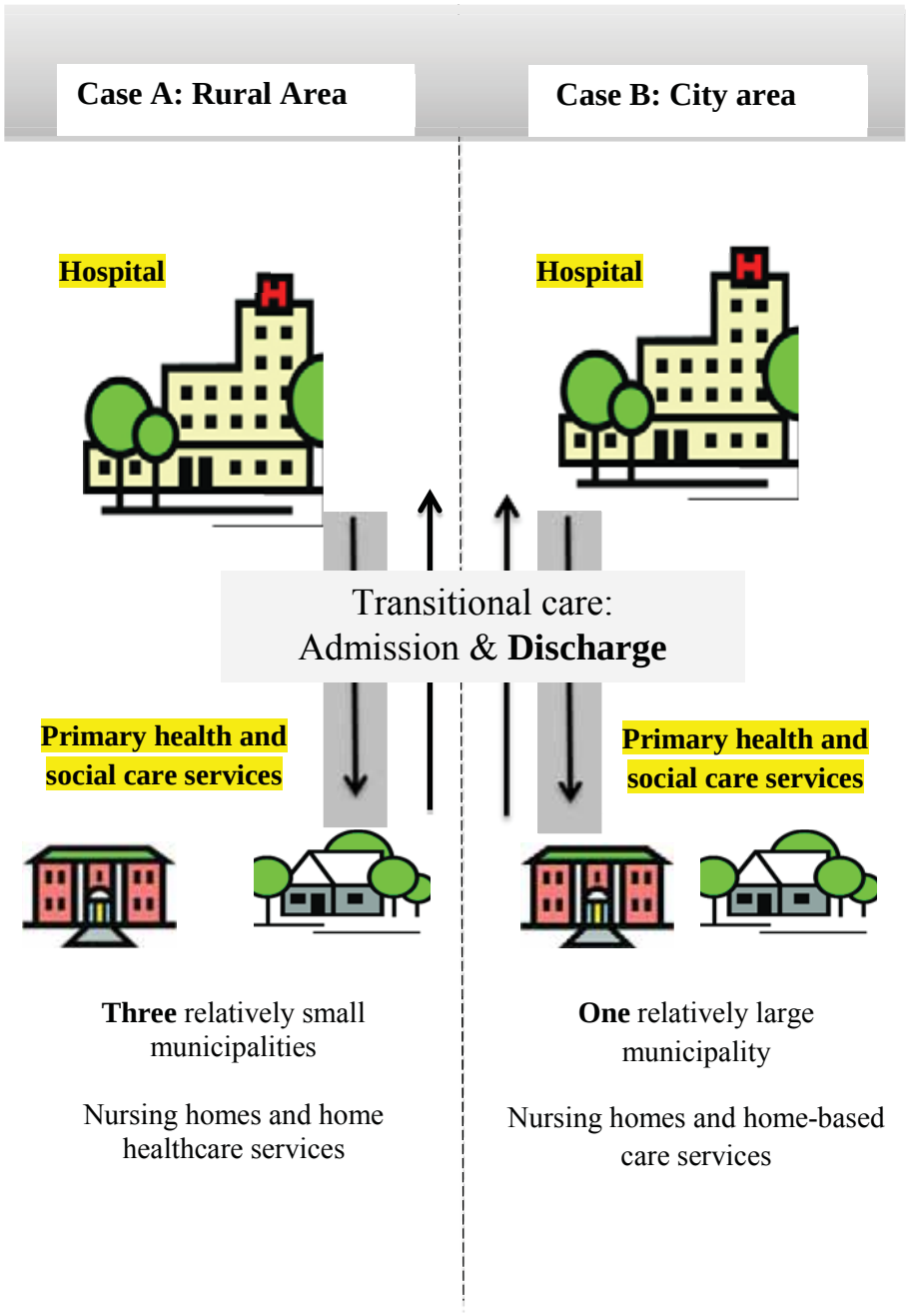

Figure 3: Case sampling in the overall research project

3.3.1 Case selection

An embedded case study design entails that the term 'case' can be applied from a variety of viewpoints; several cases can be identified within the overall case study design applied in a research project (Ragin & Becker 2009). The process of identifying and defining the case proceeds throughout the study period together with refinement of research questions and development of the analysis (Hammersley & Atkinson 2007). The case examined in this thesis was the hospital discharge practices of elderly patients to follow-up care in municipal services (nursing homes or home-based care services), as illustrated in Figure 4.

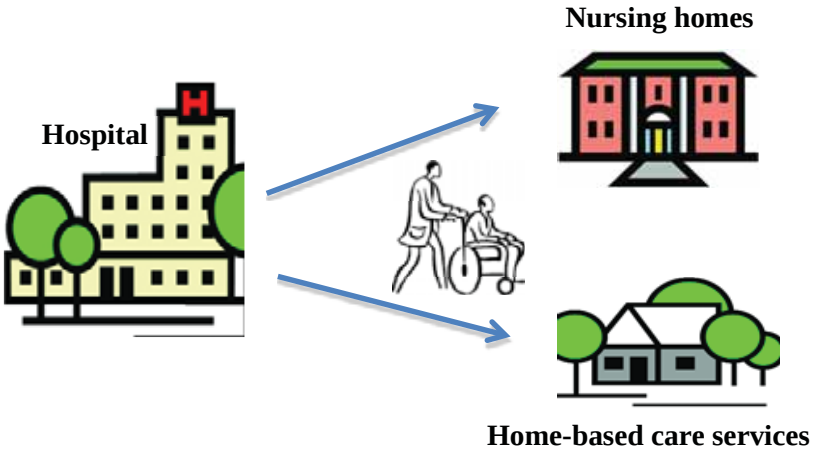

Figure 4: Case selection: hospital discharge practices of elderly patients to follow-up care in municipal services

The case study employs qualitative methods, in which observational research, supported by the methods of ethnographic research, constitutes the primary source of data. This is supplemented by individual interviews with healthcare providers in hospitals and primary healthcare services.

Qualitative methods and particular ethnographic research approaches are increasingly recognized as powerful methods for providing

understanding in a healthcare context (Leslie et al. 2013, Waring 2009, Dixon-Woods 2010, Higginbottom et al. 2013). Observational research offers a rich, in-depth, approach for studying hospital discharge of the elderly. In addition, in contrast to individual interviews or focus group interviews, it provides the researcher with the opportunity to identify context-specific issues of importance. Observational research allows the researcher to study work as it is actually performed—as opposed to work as conceived. The assumption behind most observational strategies is that they enable the researcher to learn what is taken for granted in a situation and to discover what is going on by watching and listening (Morse & Richards 2002).

A major advantage of the interview is that it permits the respondent to move back and forth in time, reconstructing the past and predicting the future. This is particularly useful in relation to the Norwegian Coordination Reform (Report to the Parliament no. 47 2008-2009) towards evaluating the resulting changes and adaptations (paper V).

The focus of the present observational study was various hospital discharge practices of elderly patients to follow-up care in municipal services. The 'case' in this study is thus regarded as signifying observations of various hospital discharge practices. The case thus relates to the practices (i.e., a process oriented approach) of hospital discharge of the elderly rather than being directed towards the patient themselves (i.e., a patient-oriented approach). The objective of the case study was to explore characteristics and identify general patterns and regularities in hospital discharge practices.

3.4 Moderate participant observations

In a study context, observations range from the researcher attending full participation in the setting to the researcher having no interaction with participants (Dewalt & Dewalt 2011). In the present study, I employed what Dewalt & Dewalt (2011) term 'moderate participant observations'. Such observations allow the researcher to be present and identifiable, though not actively participating (i.e., with no role in the social setting), observing and interacting occasionally (DeWalt & Dewalt 2011). It

allows the researcher to observe the discharge processes from multiple positions, move to different locations, and view events from different perspectives.

3.4.1 Sampling, settings, participants, and inclusion criteria

Sampling involves decisions about the setting, events, social processes, and actors to be involved and studied (Miles & Huberman 1994). It entails decisions about where to observe and when, who to talk to, what to ask, and what to record and how (Hammersely & Atkinson 2007). It is important to make any criteria employed as explicit and systematic as possible to enhance the credibility of the findings (Hammersley & Atkinson 2007).

Figure 5 presents the details of the case sampling applied in this observational study which entails a purposively sampling strategy aiming to maximize variation (Miles & Huberman 1994). The rationale for inclusion and selection is described below.

Setting:	Two hospitals, various wards (i.e., medical, orthopaedic, geriatric). Four municipalities with associated nursing homes and home healthcare services.
Actors:	Elderly patients and next of kin. Healthcare providers (doctors, nurses, patient coordinators) across hospital and primary care involved in the observed practices.

Events	Hospital discharge and follow up care post discharge.
Processes	The day of hospital discharge to primary health and care services (i.e., nursing homes and home based services) and follow-up care.

Figure 5: Case sampling

The observations took place in two hospitals and involved three types of wards (geriatric, medical, surgical). These places were selected to include a range of settings and allowed the potential context variability among the ward types to be controlled for. Seven wards were included in this study: one geriatric, three orthopaedic, and three medical wards. Since data collection consisted of follow-up care after discharge, municipal services were included in the study context, i.e., four municipalities with associated nursing homes and home healthcare services.

Elderly patients (>75 years old) from those seven wards with orthopaedic and medical conditions and in need of municipal services post-discharge (rehabilitation, nursing home, and home healthcare services) were included in the study for this thesis. The inclusion criteria for the patients were determined by the overall research project (see Paper III), with the focus being on frail elderly patients. Among those patients, the project aimed to include the following:

- Hip fracture (upper femur)
- Problems related to chronic obstructive pulmonary disease (COPD), i.e., pneumonia and respiratory disorders
- Other medical conditions, e.g., infections, inflammatory diseases, and heart problems
- Poly-pharmacy (over five medications)

- Patients with cognitive impairments meeting the above inclusion criteria
- Next of kin for the patients meeting the above inclusion criteria

An extended rationale for the applied patient inclusion criteria is provided in the study protocol of paper III. In this study patient diversity (various characteristics, gender, age, and diagnoses) was chosen to maximize variation; in this way, the aim was to develop more generalized characteristics, patterns and regularities of hospital discharge practices—independent of patient characteristics and diagnoses.

With the diversity of stakeholders involved in hospital discharge, the study also sought to sample across a broad range towards providing a comprehensive insight into hospital discharge practices. The study aimed to include the elderly, their next of kin, and healthcare personnel in different hospitals and primary-care facilities with regard to discharge practices. It has been found that the experiences related by patients and their next of kin can provide valuable inputs, highlighting strengths and weaknesses in care practices and helping bring about improvements (Doyle et al. 2013). The experiences of patients and their next of kin need to be taken into greater consideration when improving healthcare services (Bate & Robert 2007, Longtin et al. 2010, Schwappach 2010, Wiig et al. 2013, Ocloo et al. 2013, Doyle et al. 2013). The experiences of patients and their next of kin with respect to transitional care and hospital discharge are particularly important given the fragmentation of care and the number of care providers involved. Patients and next of kin are the only people to participate in the entire care process (Davis et al. 2013). It is also essential to incorporate the experiences of patients and their next of kin with regard to hospital discharge practices as a preventive strategy to improve performance and intercept vulnerabilities that may lead to adverse events (Schwappach 2010, Flink et al. 2012, Vincent et al. 2014).

The observational study started and focused on the day of hospital discharge and what took place in this period of time. That study also covered follow-up care up to 30 days post-discharge to determine the level of care, readmission, and number of transitions as well as to record

the experiences of the patients, next of kin, and healthcare personnel. Some investigations have emphasized how little attention has been paid to examining the number of care transitions a patient may undergo in the process of healthcare (Coleman et al. 2004, Naylor & Keating 2008).

Prior to data collection, a preliminary estimate was to conduct 8-10 cases of hospital discharge practices in the rural area and 12- 15 cases in the city area; covering a diversity of cases. There are no rules for sample size in a qualitative inquiry (Patton 2002). However, if external conditions are thought to produce great variation in the phenomenon under study or when trying to determine diversity and variations, a larger number of cases is necessary (Yin 2014, Patton 2002). The number of cases also depends on the desired reliability of the findings (Steenhuis & Bruijn 2006). With the observational study, the number of cases was determined by pragmatic considerations (resources, time constraints, data to be handled) (Patton 2002) and the inclusion criteria detailed above, suggesting a degree of representation among different patient types. To achieve greater robustness of the findings, I decided to use a large number of cases in the observational study (Yin 2014, Miles & Huberman 1994).

Evidence from multiple cases is considered more compelling and reliable (Yin 2014). Using adequate samples and analysed findings from a large number of cases rather than specific cases is advantageous since broad patterns emerge from a wide variety of cases. Cross-case analysis and comparisons enhance generalizability (i.e., patterns and regularities of discharge practices) and deepen the understanding of the phenomenon under study (Miles & Huberman 1994, Eisenhardt & Graebner 2007). Comparisons made across cases offer a suitable method for generating theories (Eisenhardt 1989). Cross-case comparison is appropriate if a coherent sampling frame is applied (i.e., similar settings, events, processes, and actors) (Miles & Huberman 1994), which justifies the method of sampling applied in this study.

3.4.2 Recruitment process

3.4.2.1 Study sites (hospitals and municipal services)

I sent a formal invitation letter to the chief executive at the selected hospitals and municipalities. They all consented to participate in the study. However, one condition they presented, especially the hospitals, was that the data collection had to be planned in close collaboration with the various departments and wards to take into consideration their preferences and needs. This meant that the data collection was limited during the months of June and July: this was stressed as being a busy period with many holiday stand-ins. The various ward leaders clearly expressed that they did not want to place an extra burden on their staff during that period.

All the selected sites among the hospitals and primary-care facilities were invited and offered an information meeting prior to data collection; this was so that the employees could become familiar with the study objectives, methods applied, and planned procedures. These meetings also aimed to establish a good relationship with the ward staff. All the study sites except for two hospital wards (both orthopaedic) accepted the invitation to an information meeting. Leaflets containing information about the study were distributed in staffrooms so that the employees could learn about its purpose and increase their awareness and familiarity with the study.

3.4.2.2 Patient and next-of-kin enrolment

During the data collection period, I went through the respective wards' in-patient lists together with the ward's head nurse to identify patients eligible for inclusion according to the criteria indicated in Section 3.4.1. In the rural region, I was present at the wards each day to identify eligible patients. In the city region, I met the respective head nurses regularly (usually Mondays) at the wards to identify relevant patients, or I contacted the head nurse by phone to obtain such information.

Recruitment during hospitalization can be ethically challenging since the environment may affect elderly patients' ability to provide informed

consent as a result of functional decline, strain, and cognitive impairment (McMurdo et al. 2011). When patients who met the inclusion criteria were identified, healthcare providers (ordinarily the patient's primary nurse) assessed their cognitive functioning and overall situation to determine their suitability for recruitment. I did not contact any patient before that person had given their nurse their verbal consent to be contacted and informed about the study. Once the patient had signalled their approval in this manner, I went to their bedside to explain the nature and purpose of the research and provide them with information. That information included what participation would entail and the process and procedures involved: observations on the day of discharge; conversations with the patient and preferably also their next of kin concerning their experiences; conversations with healthcare providers at the hospital and in primary care concerning their assessments and judgements of the discharge process; copies of discharge letters; and nursing records. In the case of two patients with dementia, it became clear that the patient or their next of kin did not wish for participation in the study, and so I did not proceed with the recruitment.

In the majority of cases, the patients shared rooms with other patients. This raised the possibility of disturbances and interruptions during the study presentation and consent process. Thus, during the consent procedure, I endeavoured to tailor my approach to the specific abilities of each individual, and I tried to compensate for extraneous noise. This involved my taking care where I placed my chair (beside or in front of the patient, based on their preferences), paying attention to possible impaired hearing or vision that could result in communication difficulties (the use of hearing aids or glasses), and other considerations (e.g., ensuring that the patients were comfortable in their beds). I also deliberately spoke slowly, clearly, and used simple language. I emphasized that participation was voluntary and that the patients could withdraw from the study at any point. In addition, I stressed the confidential nature of the research.

I also made the patients fully aware that participation or non-participation would not affect other aspects of their care, the discharge process, or give them any advantages or disadvantages, such as yielding any direct benefit concerning discharge or post-discharge follow-up care.

Walsh (2009) has asserted that enrolling elderly people in research merits special consideration since they are thought to represent a vulnerable group. However, aging itself does not intrinsically make one vulnerable. Vulnerability is context specific (Walsh 2009), and so is the capacity to provide consent. Being the subject of research can create stress and anxiety (Hammersley & Atkinson 2007). Accordingly, in the case of elderly patients, it is necessary to make careful, ongoing consideration of the effects of the research. Despite the confidentiality and potential psychological issues that participation could inflict upon the elderly (i.e., emotional distress through being hospitalized and concerns regarding post-discharge burden, stress, and strain), I assessed the risk associated with participation in the study to be low—based on the study objectives and characteristics. I emphasized the importance of the study while taking care not to appear to be persuasive.

In addition to receiving verbal information about the study, the patients were also provided with a research leaflet, which was printed in a large, clear typeface (see Appendix 1). I went through this leaflet together with the patient during the consent process. To ensure that the patient had properly understood the information provided, I asked them on occasions to summarize it. In a very few cases, I became aware of some uncertainty on the part of the patient concerning participation. In those situations, I invited the patient to discuss their participation with their next of kin and take that person's opinion into account before deciding.

Although patients had to provide written consent, some possessed disabilities, which made it difficult to hold and use a pen to sign the consent letter. In such cases, I wrote the patient's name in block letters, and the patient provided a short signature behind their name. Some kind of written confirmation from the patient was important since I would use that to verify participation when talking to receiving healthcare providers: such providers would presumably be more comfortable speaking about the discharge process knowing that the patient had consented to participation.

On a few occasions, some patients voiced concern about signing a formal letter despite having expressed their willingness to participate. It may have been caused by the contract style of the consent form. This is one

area of concern that has been raised when enrolling elderly people in research (Walsh 2009). Based on input from receiving healthcare providers, I revised the consent form during fieldwork—after I had conducted data collection in the rural area. Initially, the consent form included only a signature, which indicated that the patient consented to participate. However, some healthcare providers suggested that it would be beneficial if the consent form included check boxes, which displayed in detail what the patient was actually consenting to. Thus, the revised consent form consisted of several check boxes, which the patient ticked off according to their wishes. This meant that the patient had to signal their consent to possible involvement of their next of kin, copies being made of discharge summaries, and conversations taking place with receiving healthcare providers and patient coordinators (see Appendix 1).

I included the next of kin in the study only if the patient had approved such contact being established. To reinforce the next of kin's trust in the study, the nurse responsible for the patient informed that next of kin about the study on the day of discharge and asked if they were comfortable about being contacted by a researcher. If the next of kin gave approval, I contacted them by phone 1 or 2 days after discharge. Enrolment of next of kin was based on informed, voluntary consent. In cases were the patient suffered from cognitive impairment, I involved the next of kin in the consent process; I asked them if they wished to participate and provide consent on behalf of the patient. I asked the healthcare providers to give a research leaflet to the patient's next of kind when they visited, and I then contacted them by phone and provided them with information about the study.

The observational study involved patient involvement over a longer period of time (to 30 days post-discharge in the city region); accordingly, I confirmed the patients' consent whenever I met them throughout the entire process. During data collection in the post-discharge period, I asked patients to recall their knowledge of the study and those aspects of the study to which they had consented. In some cases, particularly in the city region, it was clear that the patient did not recognize me—or barely recognized me—or insufficiently recalled participation or familiarity with the study. For various reasons, the patient appeared to be confused,

and therefore I had to question their consent capacity (see below for details). In general, the patients stated that they found it difficult to remember all the details of the study and all the people they had met during the care process. Providing a photo of the researcher on the leaflets distributed to the patients could have been advantageous in this regard.

The issues described in this section illustrate the importance of continually checking elderly patients' understanding of the research purpose and reconfirming their consent. During the field work I experienced methodological challenges in recruitment and inclusion of the patient group. Lengthy periods in the hospital and numerous transitions appeared to affect their energy, willingness, and mental capacity to participate throughout the study period. In situations where the consent capacity was questionable, I ended the dialogue and direct contact with the patient (three patients). However, I did not withdraw the patient from the study since I did not regard that continuing participation was exposing the patient to any risk. I maintained contact with the responsible healthcare providers throughout the 30-day post-discharge period to record follow-up care, readmissions, and the number of transitions in primary care.

3.4.2.3 Healthcare personnel in hospitals and primary care

After the patients had consented to participate in the study, I approached their responsible healthcare provider (nurse, doctor) at the hospital early on the day of expected discharge, and I asked their permission to conduct observations. I confirmed each patient's consent and ensured that the nurse and doctor were informed about the study. None of the healthcare personnel refused my request to observe, talk, and ask questions. In fact, the majority stated that they believed in the relevance and importance of the study objectives. Participation of the healthcare providers in hospitals and primary care was based on informed, voluntary consent; consent was confirmed orally by the healthcare providers involved in the observational study. During the follow-up period in primary care, I followed a similar procedure. I approached the receiving healthcare providers (nurse, responsible doctor, patient coordinator) face to face or by phone; I informed them about the purpose of the study, the patient's

enrolment, and their consent to participate. I likewise invited the patient's coordinator in the city region to participate if the patient had given their consent for them to do so.

3.4.3 Data collection

3.4.3.1 Field procedures in the hospital setting

I based the observations on a semi-structured observation guide (see Appendix 2). This guide covered general and familiar topics related to hospital discharge. I developed it following the review of the literature and discussions within the research team, and it included the following: structures and plans, coordination with other care providers, interdisciplinary collaboration, documentation and information, coordination and communication with patient and next of kin, and context and improvement areas. In addition, the guide allowed certain issues to be examined in greater detail as their relevance became evident through the observations.

The observations started in the morning of the day of expected discharge, and they focused on work practices, context, interactions, and knowledge sharing among stakeholders (doctor, patient, nurse, next of kin, receiving healthcare provider). In some cases, there were changes or delays, and I sometimes enrolled and talked to the patient before the actual day of discharge. During the observations, I wore hospital clothing so as to be inconspicuous and reduce any differences in the research context (Hammersly & Atkinson 2007). I was positioned at varying proximity to the individuals being observed, which sometimes made it difficult to capture every detail in the dialogue among the actors involved. This was particularly the case during ward rounds. During the observation, I did not emphasize any specific perspective, such as that of the patient, nurse, or doctor; instead, I paid attention to the activities being performed, how the various actors were involved, and their interactions. The observational study included the patient as the principle subject together with their next of kin and the healthcare personnel involved, the functions each performed, and their interactions.

I carried out the conversations with the healthcare personnel and patients during or after observations to clarify observed work practices and capture assessments and viewpoints related to the current discharge process. Conversations are important aspects of all fieldwork however they are not simple conversations since the researcher has an agenda and must retain some control over the proceedings (Hammersley & Atkinson 2007). In the present study, I conducted conversations with healthcare personnel to obtain assessments and viewpoints. I also carried out conversations to check information and stimulate dialogue about impressions and interpretations during the course of observation. However, the duration and scope of those conversations was somewhat restricted, especially when approaching doctors, since I did not wish to be too disruptive.

I usually conducted conversations with the elderly patients several times on the day of discharge. However, I took care not to do so if it would disrupt clinical work, such as taking blood samples and making visits and ward rounds, or if it seemed to be inconvenient to the patient, for example if they became tired during the conversation and seemed to be in need of a break. The first conversation focused on getting to know the patient and learning how they were admitted, what had happened to them since admission, and details of the course of their hospital stay. This knowledge provided a basis on which to relate to the patient during the observational period. Further, I asked the patients to describe their experiences of the discharge process openly from their own perspective. These conversations had elements of a structured approach. I asked the patients about issues regarding satisfaction, involvement, participation, information exchange, discharge planning, concerns, and areas for improvement. I conducted the conversations with the next of kin by phone after discharge if the patient gave me their consent to do so. Conversations with next of kin involved the same structure and themes as with the patients.

I collected copies of the discharge summaries during the observations so that I could ask receiving healthcare personnel in primary care to assess the quality of the written documentation and the current discharge process from their perspective. The responsible nurse or ward secretary deleted direct person-identifiable information and any information not

relevant to the study (i.e., previous medical conditions, history) from the copies. No copies were made without the consent of patients. I made no recordings during the observations owing to ethical considerations (confidentiality issues), the complexity of involvement among personnel, patient, and the next of kin, and the possibility of poor recording quality (i.e., background noise) (Hammersley & Atkinson 2007).

I made my observation notes consecutively and discreetly during the observations. I wrote them by hand in notebooks, and they included a mixture of personal impressions, direct quotations, and descriptions of individuals or groups. The settings in which data collection took place offered periods of time in the hospital cafeteria or in hospital corridors, which allowed me to make detailed notes. I recorded the conversations primarily as field notes. In some situations, I wrote direct quotations, but I distinguished those from my own interpretations. In addition, I made a summary of each observation in electronic format immediately after it took place, and that summary included reflective notes. Writing up the field notes after the observations took me many hours.

3.4.3.2 Field procedure in primary care settings

I conducted a follow-up assessment after discharge, which served several purposes. It involved such details as where the patients had stayed (i.e., level of care), readmission, the number of transitions, and the experiences of the patient and their next of kin. In addition, I conducted conversations with healthcare personnel (receiving doctor and nurse) to learn their experiences and assessments of the discharge process and follow-up care. I carried out these conversations mostly face to face and in the context of the observation, though I conducted some by phone. During the follow-up period, I asked the receiving healthcare personnel (primary care-based doctors and nurses) to assess the quality of the nursing discharge record and medical discharge letter. In the city area, I also contacted the patient coordinators and asked for their assessments and evaluations of the overall quality of the current discharge process. I did encounter some difficulties in establishing contact with doctors in the municipalities after discharge—especially with general practitioners owing to their busy schedules. In the rural area, I conducted follow-up

conversations with patients and their next of kin (if enrolled) and receiving healthcare providers once 2–7 days after discharge. In the city area, I followed up the patients for 30 days after discharge, and I conducted the conversations with the patient, their next of kin, and healthcare personnel with respect to each transfer that the patient experienced during that period. Patient outcome or consequences of subsequent care following discharge (e.g., delay in diagnoses, treatment, adverse events) was not included or assessed during the follow up.

I collected the data from March to October 2012; there were, however, restrictions during the months of June and July, as noted above. I made my observations only from Monday to Friday and during regular working hours (8 a.m. to 4 p.m.). I thus excluded evenings and weekends for practical and resource-based issues. Consequently, this study did not adequately represent the range of temporal variation (Hammersely & Atkinson 2007).

I distinguished my field notes related to the various cases by code, and the list matching personal identification with the code was securely stored at the research institute (University of Stavanger). Nursing records and discharge summaries were likewise stored in a locked cabinet at the university, access to which could be gained only by myself and the project manager.

3.4.4 Data material

I conducted 20 case observations (i.e., hospital discharge practices) in two hospitals at different wards. I made six observations in the rural area (30 hours of observations, 40 pages of field notes in electronic format) and 14 observations in the city area (60 hours of observations, 110 pages of field notes in electronic format). The number of observations conducted in the rural area deviated from the original plan of 8–10 cases owing to the lack of patients in the three municipalities who met the inclusion criteria. The rural hospital area consisted of 26 relatively small municipalities. However, I enrolled only three municipalities, which were those relatively close to the hospital, owing to practical and resource-based issues. The distribution of the ward and hospital types, the number of cases, and hours of observations are presented in Table 1.

Table 1: Distribution of observed hospital discharge practices by hospital and ward.

Hospital (Rural)	**Cases**	**Hours of observation**
Orthopaedic ward	2	10
Medical ward *	4	20
Total	**6**	**30**
Hospital (City)	**Cases**	**Hours of observation**
Orthopaedic ward 1	2	11
Orthopaedic ward 2	3	13
Specialized medical ward 1 (Pulmonary diseases)	3	12
Specialized medical ward 2 (Kidney diseases and infections)	2	9
Geriatric ward	4	15
Total	**14**	**60**

* No specialized geriatric ward existed at the rural hospital

Seven case observations (i.e. discharge practices) involved orthopaedic patients with hip fractures; 13 involved patients with various medical diagnoses (chest pain, pneumonia, urinary infection, urinary sepsis, heart attack, malnutrition, arteritis, and COPD). However, the majority of patients had several additional diagnoses, such as COPD, kidney failure, heart failure, and heart disorder. I enrolled three patients with dementia in the study. The patients were aged 75–97 years and consisted of 11

woman and nine men; they used 5–18 medications on discharge. The hospital duration varied from 2 to 23 days.

The majority of the patients were discharged to a higher level of care than they received before admission. Of the 20 patients, 18 were admitted to the hospital from home (with home-based care services); of those 18, 16 were discharged to a short-time stay at a nursing home. The remaining four patients were discharged directly to home with home-based care services. Of the 20 patients, five spent additional time at the hospital (1–5 days) after being determined ready for discharge. During the follow-up period, patients were transferred one to five times within the municipality or between the municipality and hospital. Three patients were readmitted to hospital, and two patients died during the follow-up period.

During the observational period, I conducted 173 conversations with various stakeholders (37 in the rural and 136 in the city area). Distribution of conversations with the stakeholders conducted in the rural and city areas in hospital and primary care are presented in Table 2.

I conducted conversations with both the patient and responsible hospital nurse before or on the day of hospital discharge. Conversations that took place prior to the discharge day did so when changes occurred in the discharge process. In Table 2, conversations in either case are treated as single conversations. The duration of the conversations varied from a few minutes up to 30 minutes. Conversations with patients and nurses were longer than those with doctors—especially hospital doctors. In all, 13 next of kin participated in the study: three spouses, four daughters, five sons, and one sister. Among the remaining patients, four did not have any close relatives, and in three cases the next of kin refused to participate in the study. Three patients had dementia and thus conversations were only conducted with next of kin.

Table 2: Distribution of observational conversations with stakeholders

Rural area		**City Area**	
Hospital		**Hospital**	
Patient	6	Patient	14*
Hospital doctor	4	Hospital doctor	10
Hospital nurse	6	Hospital nurse	17
Municipality		**Municipality**	
Receiving nurse	9	Receiving nurse	32
Receiving doctor	5	Receiving doctor	15
Patient (follow-up)	3	Patient (follow-up)	20
Next of kin	4	Patient coordinator	7
		Next of kin	21
Total	37	**Total**	136

***** Three patients were readmitted to the hospital during the 30-day follow up

3.4.5 Analysis

Data analysis was a continuous process throughout the entire research project (Hammersley & Atkinson 2007). During the observational study, I was able to identify initial hospital discharge practices and contexts. I wrote short summary memos and reflective notes based on my impressions after collecting the data. Those impressions were of practical

use in guiding the subsequent data collection, such as in extending the scope of follow-up care in the city setting.

Miles and Huberman (1994) emphasize that the production of summaries must be treated as part of the analysis and not as a separate activity. During the course of my observations, I was able to identify particular aspects, and this allowed me in my field notes to focus more on certain subject areas. I developed an analytical process, and to some extent that changed and extended what I included in my field notes; for example, I tended to focus more on variability and potential performance-shaping factors and less on the activities and functions being performed.

Prior to data collection, I had been familiar with the Functional Resonance Analysis Method (FRAM) (Hollnagel 2012a); however, I decided to apply this methodology after completing data collection in the rural area. The result of this was more robust data collection in the city setting. As a consequence, I reformulated my research questions and the focus of my research: it changed from one of examining only hospital discharge practices towards combining that with a more descriptive approach—investigating why hospital discharge practices vary and the reasons for that variance.

I planned and performed the analytical process according to the study objectives and its theoretical basis—the FRAM (Hollnagel 2012a). Since the dataset was complex, I conducted the analysis of the case studies over a period of 8 months, and it consisted of several phases.

3.4.5.1 Initial phase

I reviewed the entire observational material (150 pages of field note summaries) personally and also as part of a team of the four researchers involved in the overall research project. The team members had experience in nursing, safety science, user involvement, and change management, and we adopted a bird's-eye perspective in analysing the material (Malterud 2012), as described in the study protocol (Paper III). The purpose with this analysis was to obtain an overall impression and to identify preliminary themes in the dataset. An external researcher who had been involved neither in developing the observation guide nor the

observations participated in the analysis by reading the observational material. The five researchers then held a 1-day meeting to discuss the analysis. The primary goal of this meeting was to discuss and examine nuances in the data and themes, their meaning, and how these could be used to shed light on research objectives of the overall research project. As noted above, the field notes were anonymous. All traces of the patient's identity were removed and did not appear to the research team members taking part in the initial phase.

3.4.5.2 Identifying and describing functions

Following the initial phase, my co-authors and I conducted a thorough analysis, which involved identification of functions [6], based on the preliminary analysis. We repeatedly reviewed and coded the field notes from each case observation as functions towards understanding the dynamics with respect to each case (i.e., discharge practice) before proceeding to cross-case comparisons and explanations (Miles & Huberman 1994). I wrote a summary of each case based on the identified functions. Using these summaries, we searched for similar configurations (functions) within one case; we then proceeded to the next case and looked for repeated patterns and common functions (Miles & Huberman 1994). Thus, our analysis constantly moved from the specific to the general with the aim of obtaining common functions among the different cases. We revised the functions several times until we reached final consensus. These functions were therefore 'observer identified' rather than being identified by healthcare personnel (Hammersley & Atkinson 2007). At an early stage of the process, we identified 14 functions. During the analysis, we combined four functions; the result was thus 10 common functions that embraced hospital discharge of elderly patients to primary healthcare services (see Paper IV).

According to the FRAM, there is no single correct level of functional description. The general rule for the level of description is that it should be appropriate with respect to the activity or performance under consideration (Hollnagel 2012a). Functional analysis based on a textual

[6] Functions refers to the activities or set of activities that are necessary to produce a particular outcome, e.g. hospital discharge of the elderly to follow up care in municipal health and care services (Hollnagel 2012a).

description of the functions and their various aspects is emphasized as the principal framework for the FRAM (Hollnagel 2012a).

Since the scope of this analysis was on functionality on the day of hospital discharge, a rational starting point was the function called 'review of hospital inpatients—determine whether the patients are medically fit for discharge'. This function activated subsequent functions. A realistic end point for the analysis was the function 'follow-up care in the municipality' since this is when the patient physically leaves the hospital and the municipality assumes responsibility.

We assembled and presented the description of functions in table formats, which helped structure the data across all case observations (see example in Appendix 3). The tables were useful when trying to determine the meaning of variables (their discharge function) among different cases. The tables helped identify variability and facilitate comparisons (Miles & Huberman 1994).

3.4.5.3 Identifying variability

The FRAM is a methodological approach that supports cross-case analysis; however, it does not provide a strategy for identifying variability, nor does it indicate what is needed to achieve this when analysing multiple cases. We applied several tactics when searching for cross-case patterns of variability. The aggregated table description of functions with their associated aspects, detailed in the previous section, provided the basis for the variability analysis. We compared and contrasted the various cases using the tabular description for each function and looked for similarities and differences. To evaluate performance variability, it is necessary to consider each function in order to understand how likely it is to vary (Hollnagel 2012a). The analysis also incorporated a review of the experiences and assessments of the various diverse stakeholders.

Three analytical themes emerged from this process that characterized functional variability among the 20 cases: timing, duration, and perceived precision in performance. With regard to timing, the FRAM suggests categorization in terms of being too early, on time, too late, or

not occurring at all. With regard to precision, FRAM refers to imprecise, precise, or acceptable outcomes. In the context of hospital discharge and in light of the multiple stakeholders involved, we found these subcategories to be inappropriate; this was because consensus regarding their definition was questionable, variable, and could depend on stakeholder perceptions. We assembled and presented variability in a table format to facilitate understanding (Miles & Huberman 1994). This table is presented in paper IV.

3.4.5.4 Identifying performance-shaping factors

We elaborated performance-shaping factors (PSFs) in the final step of the analysis. PSFs represent the issues that play a role in the phenomenon under study and affect performance (Hollnagel 2012a). According to the FRAM there are three different reasons for variability in a function: (1) variability in the function itself (internal variability); (2) variability in the working environment (external variability); and (3) variability due to connections between functions, whereby the functions provide variable input to successor or related functions (Hollnagel 2012a).

The analysis applied in this study examined PSFs by using a multilevel approach based on Moray's framework of socio-technical systems (Moray 2000), as illustrated in Figure 6. This framework has been employed by others (Flin et al. 2009).

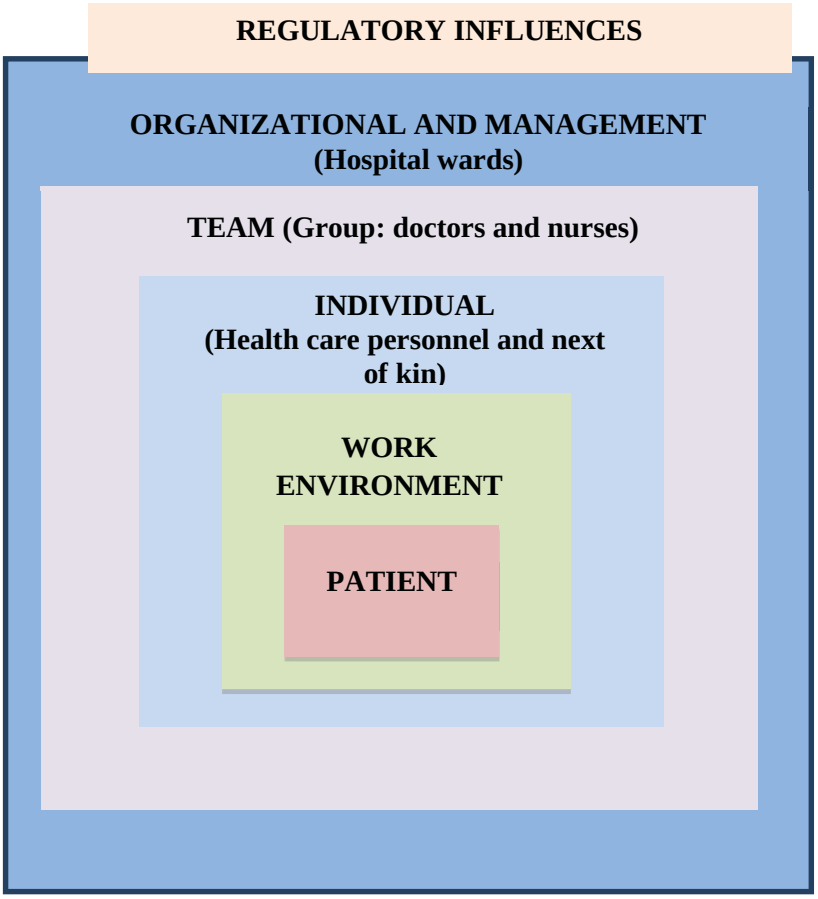

Figure 6: Framework of socio-technical systems

We adopted the framework to analyse the PSFs, adjusted to the multi-layered healthcare discharge context. The multilevel analysis of PSFs involved the patient and other stakeholders at both the individual and team level; it also included organizational, contextual, and regulatory factors that were observed and expressed as influencing performance. The framework applied extends Hollnagel's (2012a) definition of PSFs by being more specifically focused on layers and stakeholders. Thus the socio-technical system view (figure 6) complements the FRAM from an analytic point of view by including the issue of micro-meso-macro

linkage. The framework was thereby used as an analytic tool to complement the FRAM to help organize and identify external variability. The analysis focused on identifying the influential external PSFs rather than aiming to describe the relationship among them at different levels of analysis (cause-effect). Causality is not included in the FRAM. The description of functions and associated aspects (see example, Appendix 3) was used to identify dependencies between functions. The primary aim of the analysis was to raise an awareness of significant PSFs associated with hospital discharge practices.

3.4.6 Role of the observer

In a qualitative inquiry, the trustworthiness of the data is directly related to the reliability of the researcher who collects and analyses the data. What the researcher 'sees' is mainly dependent on their interests, biases, and backgrounds (Patton 1999). However, researchers should strive neither to overestimate nor underestimate their own effect; they should take their responsibility seriously in describing and studying what that effect may be (Patton 1999).

I have a nursing background with 6 years of work experience in various hospital and primary-care settings. A nursing background involves having a pre-understanding of the healthcare context. I thus conducted the present research in a familiar setting. This insider perspective assisted the data collection in several ways. I was familiar with the medical terminology, which enabled me to follow conversations without being too disruptive through having to ask for meanings or clarifications. I was also accepted by the healthcare personnel taking part in the observations; that was probably related to my background as a nurse and provided reassurance for the purposes of the study. In addition, my experience in patient care gave me knowledge and confidence to approach and talk to elderly patients and assess their clinical status, i.e., appropriateness in conducting, continuing, or ending conversations. My nursing background also gave me experience in reassuring the patients and increased their trust regarding my interests and engagement in the study field.

It is, however, necessary to recognize and guard against the overfamiliarity that an insider perspective may exert on data collection and analysis. In a familiar research setting, it may be difficult to suspend one's preconceptions—whether these are derived from social science or from everyday knowledge (Hammersley & Atkinson 2007). The approach applied in the study, which was inspired by observational ethnographic methods, allowed me to try and suspend my presuppositions by focusing on what people said and did during discharge practices. Even though I was familiar with the study context, I was a novice in conducting observational research and had to develop my observer skills during the data collection.

During the fieldwork, I did experience some emotional involvement, which included feelings of empathy with some of the elderly patients. This was particularly the case in the city area, where I followed the patients 30 days after discharge. I thus developed a close relationship with some of the patients, which may have affected my attitudes and raised issues concerning detachment and objectivity (Iacono et al. 2009). Conversely, developing a good relationship with study participants may have a positive effect on the quality of the data obtained (Capara & Landim 2008).

I also have a master's degree in change management (2009) with a specialization in safety (risk and society, health, environment and safety). In my master's thesis, I examined physicians' working hours in relation to patient safety. In addition, I worked for 1 year as a health environment, safety, and quality advisor at an oil-related company. All this has given me knowledge and practice with recording safety-related issues, which I consider a strength for the observational study.

3.5 Individual interviews

I conducted individual in-depth interviews with different healthcare providers, who represented both hospital and municipal services. For practical reasons in the rural area, I conducted the individual interviews after a period of observation (approximately 14 days). In the city region, I carried out the interviews after the observational study had been

completed. I developed semi-structured interview guides for different healthcare providers (see example in the Appendix 4) based on literature reviews (Papers I and II); and further revised them following the observational study (Paper III). I did not use the guide rigidly and did not ask all informants all questions; I also did not necessarily use the questions in the same order. This allowed flexibility in responses according to the particular interests and experiences of the participants.

I conducted both the observations and the interviews. I did not undertake a detailed analysis of the observational data at the time of the structured interviews. Nevertheless, my rough first impressions based on the field experience, observational notes, and summaries allowed me to prioritize important issues within hospital discharge. This approach gave me an important contextual understanding, on which I was able to conduct the structured interviews.

3.5.1 Recruitment and sample

Recruitment was guided by purposive sampling, which aimed for diversity with respect to specialties and disciplines, gender, age, and work experience. I mainly carried out the recruitment myself; however, in some cases, a head nurse did this, especially within the municipalities in the rural area. Participation was based on informed, voluntary, written consent (see Appendix 5). Some of the interviews involved healthcare personnel who had taken part in the previous observational study, which thus entailed an established relationship prior to the interview setting (Hammersley & Atkinson 2007). I conducted 57 interviews in hospitals and primary-care facilities. Table 3 presents the distribution in terms of sites, professions, and number of interviews.

Table 3: Individual interviews

Rural Area		**City area**	
Hospital	15	**Hospital**	11
Nurses	8 (+2 pilot)	Head nurses	4
Doctors	7	Chief physician/ Head of department	7
Municipalities	19	**Municipality**	12
Nurses – home healthcare	8	Patient coordinators	6
Nurses - nursing homes	7	Head nurses nursing homes	4
General practitioners	4	General practitioners	3
Total	34	**Total**	23

The interviews lasted 30–90 minutes and took place at the participants' workplace. Some of the interviews with hospital doctors were relatively short since the duration was determined by availability and current workload. Interviews with general practitioners were also limited because it was difficult for them to schedule time during working hours. I did not include patient coordinators in the rural area owing to variability in the coordination of discharge planning. I did not include home healthcare nurses in the city area because of resource-based issues. I recorded all the interviews with the healthcare providers using a digital recorder; these were then transcribed and anonymized. I transcribed 37 of the interviews verbatim myself; the remaining 20 were transcribed by a professional transcription service. The electronic written transcripts consisted of 490 pages.

3.5.2 Analysis

A variety of approaches is available for analysing qualitative interview data. The research focus, aim and theoretical orientation guide the choice of analytical approach and strategies (Hammersley & Atkinson 2007). The analytical approach in this study was guided by research question (e) (see section 1.3), how the hospital discharge system adapts to its contextual environment, following the implementation of the Norwegian Coordination Reform, and the implications of those adjustments. The analysis of interview data was therefore approached with pre-defined analytical concepts: adaptions and implications following the Coordination Reform (Hammersley & Atkinson 2007, Braun & Clarke 2006). These pre-defined concepts guided the analytical approach and the focus of the data analysis within the resilience perspective (Braun & Clarke 2006, Hollnagel 2012a).

The interview guide covered several themes (see Appendix 4 for an example) including coordination between the hospital and the municipalities. This covered questions directly related to the Coordination Reform. The analysis of the transcripts focused primarily on parts of the text dealing with a specific issue (e.g., experiences with the coordination reform) or, in analytical terms, a content area (Graneheim & Lundman 2004). As the analysis of the interview data was conducted after a detailed analysis of the observational data, I also approached it with some prior knowledge, initial familiarity and analytical understanding about relevant patterns.

3.5.2.1 Initial analysis

The initial analytic approach to the interview transcripts was based on Malterud's (2012) first step, or "overall impression" in a systemic text condensation tradition. This approach requires the researcher to read all the transcripts to establish an overview of the data, which I therefore did by selected content area (e.g., experiences with the coordination reform). This gave me an overall first impression and allowed me to familiarize myself with the data. During this process, I looked for similarities, differences and preliminary recurring themes, to start to identify patterns. Recurring themes associated with the participants' experiences with the

coordination reform emerged from this initial step of the analysis. A strategic data set of 10 interviews was then extracted from the data corpus[7] for an in-depth analysis for Paper V.

3.5.2.2 Extraction of interviews

The interview material in Paper V is based on 10 interviews with representative informants from the rural and city areas (five for each), different specialties (nurses, doctors, general practitioners, and patient coordinators), and hospitals and primary care. A strategic sampling of interview transcripts ensured suitable coverage of healthcare providers and organisational representation (Patton 2002). Representation across specialities was a deliberate choice to cover both hospital and primary care perspectives. The patient and next of kin perspectives were covered through the use of the observational material.

3.5.2.3 The analytical approach applied in Paper V

The analytical process for the selected data set was inspired by Braun and Clarke's (2006) description of thematic analysis, a flexible approach to analysing qualitative data that searches for themes or patterns within data. Here, a theme captures something important about the data in relation to the research question, and represents some level of response pattern or meaning within the data set. The thematic analysis of the chosen content area (i.e., experiences with the coordination reform) was performed in several steps.

First, the extracted interviews were read through independently by two researchers. The transcripts were read again, more carefully, generating codes and searching for themes (Braun & Clarke 2006). They were coded by highlighting segments of data relevant to the predefined content area, to indicate patterns. The different codes were then sorted into themes, and we met to agree recurring themes and patterns across the data set.
Three main themes were identified for the first pre-defined analytic concept (changes and adaptations following the reform). These three

[7] The "data corpus" is all data collected in a research project, while the term "data set" refers to all the data from the corpus that is used for a particular analysis (Braun & Clarke 2006).

themes are described in Paper V under separate headings of discharge planning between hospital and primary care, flexibility in primary care, and time efficiency. Subthemes were also identified for the implications. As an example, seven subthemes were identified under discharge planning. These included organizing coordination, degree of familiarity, increased self-interest, increased focus on dialogue, discharge planning, demands on administrative work and degree of involvement. Citations from the themes and subthemes were compared across the data items (e.g., interviews) and the most illustrative were selected for each theme and subtheme.

To cover the patient and next of kin perspective, we analysed the field notes using the themes and subthemes identified in the interview data set. These findings are shown as quotes from the conversations with patients and their next of kin.

Figure 1 in Paper V summarises the interpretations and synthesis of the analysis by perspective (i.e., hospital, primary care, patient) and the relationship between them. The ability to present the results in terms of a story line, map or model is encouraged in thematic analysis (Vaismoradi et al. 2013). Figure 1 in Paper V therefore shows the story told by the data, a coherent pattern of experiences identified in the data material.

3.6 Research quality

There is debate as to how the quality of qualitative research should be assessed (Pope & Mays 2006). In this study, I applied the quality criteria suggested by Lincoln and Guba (1985).

3.6.1 Credibility

Credibility in this regard refers to confidence in the data, and it involves two aspects: conducting the study and describing its results such that they are regarded as credible by external observers (Lincoln & Guba 1985). I have striven to provide a thorough description of the process of data

collection and analysis for others to take into consideration when interpreting the study findings. I have also attempted to remain aware of, reflective about, and critical of my own role and effects, my preconceptions, and my background. I undertook this to enhance the credibility of the findings and interpretations.

Prolonged engagement in the field, persistent observation, triangulation, and member checks enhance credibility (Lincoln & Guba 1985). The longitudinal nature of this study helped ensure the relatively prolonged engagement in the field, whereby I conducted data collection over a period of 6 months. However, since the study included a number of sites (multiple and different settings), the observational case study involved less time being spent in each setting; there was thus a trade-off between breadth and depth (Hammersly & Atkinson 2007). The purpose of persistent observation is to identify characteristics and elements that are most relevant to the problem or issue at hand and focusing on them in detail (Lincoln & Guba 1985). I ensured persistent observation in the present study by identifying the common functions (characteristics) being performed during hospital discharge of the elderly patients up to follow-up care in municipal services and providing in-depth descriptions of patterns, variability, and the process of accomplishing those functions.

Four kinds of triangulation can contribute to verification and validation of qualitative analysis*:* methods triangulation, triangulation of sources, analyst triangulation, and theory triangulation (Patton 2002). I principally obtained triangulation by employing multiple data sources (multiple stakeholders), different data collection methods (observations, conversations, interviews), and triangulation during the analytical process (multiple analysts, analytical methods). The data material was comprehensive and involved multiple settings, multiple cases, and the accounts of different stakeholders, which I considered provided complementary sources of insight. Triangulation was achieved during the analytical process, whereby all members of the research team actively participated in and reflected upon the findings; this provided a basis for checking interpretations (Hammersley & Atkinson 2007).

Member checks involved my presenting my early interpretations and conclusions to relevant stakeholders and other researchers to confirm,

clarify, and develop the identified issues (Lincoln & Guba 1985). In this study, member checking occurred continuously during data collection. The purpose of conversations conducted during the observations was to check and stimulate dialogue with regard to emerging impressions and interpretations. In addition, I presented preliminary interpretations from the observational study to the healthcare providers during individual interviews and asked for their comments to test for consistency. Furthermore, the research team held a 2-hour presentation at a 1-day seminar for nurses working at the orthopaedic wards enrolled in the study in the city area. At the seminar, the nurses heard the preliminary findings of the study. Interpretations were not questioned and perceived as legitimate.

3.6.2 Transferability

Transferability refers to the degree to which findings can be generalized to other settings, groups, or context (Lincoln & Guba 1985). It is not possible to achieve transferability by random sampling but through purposeful sampling; it is also necessary to provide a rich, detailed description of the study setting so that other researchers have sufficient information to judge the applicability of the findings and conclusions to other contexts. In the present study, I applied a purposeful, multiple, broad sampling strategy to determine common patterns and provide general descriptions of hospital discharge of elderly patients in different cases and settings. The thesis includes a description of the study context and setting as well as related policies, which will allow other researchers to assess the applicability of the conclusions in other settings.

3.6.3 Dependability

The dependability criterion rests upon credibility and refers to the consistency of the research process, its stability over time and with different researchers and methods. This means that the findings may be repeated with similar participants and contexts (Lincoln & Guba 1985). I initiated and conducted data collection shortly after the implementation of the Coordination Reform in 2012. That reform imposed demands for changes to the discharge system, which affected both hospitals and primary-care facilities. It may thus be questioned whether the

circumstances under which I carried out data collection can be re-created. The Coordination Reform resulted in several measures being initiated, including legislation, mandatory cooperation between hospitals and municipalities, guidance, and financial instruments. These requirements resulted in changes to general practices and established behaviour; it naturally takes time for adjustment to these changes to occur. Thus, in an early implementation phase, there may be greater uncertainty regarding new procedures and requirements, and it may be that adaptation is not fully developed. Replicating the findings of the present study at a time when changes have reached a more mature stage could yield different results since the healthcare personnel would be more adapted to the changes incurred by the reform. Another important point is that the present study findings emphasize the influence of contextual conditions on discharge practices and outcomes; these are highly variable and would make repeated findings difficult, if not impossible.

3.6.4 Confirmability

Confirmability is related to the freedom from unacknowledged research biases and being explicit about the inevitable biases that exist (Miles & Huberman 1994). The major technique for establishing confirmability is the confirmability audit, which involves triangulation and the creation of a reflexive journal (Lincoln & Guba 1985). I conducted an audit trial during the study, which involved a project proposal, theoretical and methodological orientation, filed records (field notes, process notes, and summaries), and analysis records (tables and data reduction summaries). I also strove to be explicit and conscious about my own preconceptions, background, and potential biases as they may have affected the study. As a member of a larger research project, I collaborated both with other research team members and an expert advisory group. I also attended several conferences and seminars, which allowed me to test my empirical interpretations and theoretical orientation.

3.7 Ethical considerations

This study was based on an overt research approach: the participants were aware of the researcher's presence and the ongoing research process (Dewalt & Dewalt 2011). I took ethical issues related to information and consent-seeking activities into consideration during the research process as described earlier (presented in Section 3.4.2). Prior to beginning the fieldwork, we obtained ethical approval from the Regional Ethics Committee for Medical and Health Research (see Appendix 6). In addition, I signed a declaration of confidentiality at the two hospitals included in the study.

3.8 Methodological reflections

In this section I will reflect upon methodological choices made relating to study limitations, strengths, and possible alternative approaches.

3.8.1 Limitations

A number of limitations merit consideration when interpreting the results of this study. Some issues have already been considered, but I will provide a short summary here covering both Phase 1 (literature review) and Phase 2 (empirical case study).

3.8.1.1 Phase 1—Literature review

A literature review is a complex task that requires a systematic, rigorous approach (Bote & Beile 2005). I acknowledge that neither of the reviews (Papers I and II) fully satisfy the requirements for conducting a detailed, comprehensive, integrative review (Whittermore & Knafl 2005), such as a thorough description of the review procedure (e.g., a flow diagram) and an assessment of the quality of the included studies (Glaziou et al. 2001, Nicholson 2007, Whittermore & Knafl 2005). A description of the data analysis stage is also absent in the reviews but included in section 3.2. The two reviews also have other limitations, such as the absence of a second reviewer to assist with study selection. In conducting the

literature reviews, however, the intention was primarily to set the stage for and support the empirical case study (Phase 2).

I excluded patients with dementia and hip fracture from the literature search, though such patients were included in the empirical study. The decision to include patients with dementia and hip fracture in the empirical research was only made after the reviews had been completed. This reduced the ability to identify potential risk factors associated with those two particular patient groups. The review of interventions (Paper II) included only studies with positive outcomes. I acknowledge that it is important to be aware of factors related to studies that do not achieve significant or positive results. However, despite these limitations, the information obtained from the literature reviews provided valuable insight and useful guidance for the empirical study.

3.8.1.2 Phase 2—Empirical case study

I conducted the empirical study in the context of the Norwegian healthcare system, with a sample size of 20 patient cases in two hospital regions. This potentially reduces the generalizability of the findings. My access to and conversations with doctors, both in hospital and in general practice, were to some degree restricted during the observational study: they were busy, and their time was limited. I therefore received less input from them than from nurses.

Given the scope of this study, with its complex processes and multiple settings, stakeholders, and perspectives, it was necessary to eliminate some level of detail (Hammersley & Atkinson 2007). I focused on the final stage of hospitalization, i.e., the actual discharge process. It would have been valuable to acquire data on the patients' entire clinical pathway from the day of admission, through the hospital stay and into follow-up care. This could have been accomplished by developing a more patient-centred strategy focusing on interdependencies during a set of transitions occurring along the care pathway.

I made my observations during regular working hours (8 a.m. to 4 p.m.). Round-the-clock observations would have enhanced the breadth and variability of the data. I was concerned with identifying generic hospital

discharge functions. Additional functions that are essential or specific only for certain patient groups were not included in FRAM. Following the aims of the study, we chose to focus on FRAM's applicability to hospital discharge to explore its characteristics and general patterns of variability in discharge practices, rather than addressing the specificities of each case.

The impact of the observer on the setting and actors being observed is commonly raised in observational studies (Patton 2002). Here, I conducted all the observations—a single researcher with a nursing background. I therefore had preconceptions about the context. To overcome and control such observer bias, all members of the research team held weekly meetings or updates during the observation periods. This permitted consideration of the data by a number of individuals, and created the opportunity to raise and consider alternative interpretations and assess emerging findings. The presence of a researcher may also create a halo effect, with healthcare providers performing better, and being motivated to display their expertise. Conversely, it can create so much tension and anxiety that performance falls below par (Patton 1999). On a few occasions, I observed the nurse responsible for a patient reminding the doctor of certain case-related details while glancing at me. This occurred most often during the ward rounds, and may to some extent have influenced the doctor. Researchers should recognize that they are likely to disturb agents by their efforts to observe because they exchange information and are a part of the system (Jordan et al. 2010).

The comprehensiveness of the data material entailed trade-offs concerning focus and contributions made by the thesis. The voices and perspectives of the various stakeholders therefore have limited presence, especially in Paper IV. I also acknowledge that the use of interview data in this thesis is limited, which restricted the triangulation of the data collection methods. This is because the analysis of the observational study and the use of FRAM were comprehensive and time-consuming. A complete analysis of all the interview material will follow in a later paper, but is not part of this thesis.

I also acknowledge that the analysis conducted in Paper V was driven by analytical preconceptions around a specific research question. This form

of thematic analysis tends to provide less richness in the overall data, but more in specific aspects (Braun & Clarke 2006). Compared in this way, an inductive approach to the analysis could have resulted in other interpretations.

The FRAM analysis abstracted performance variability from its context and each particular case observation, to develop an overview of variability based on the 20 cases (see Table 3, Paper IV). According to Hollnagel (2012a), couplings and variability should always refer to a concrete instance of the model rather than the model itself. This therefore represents a limitation in the FRAM approach, as applied in this study. It might have been helpful to use one case, a single hospital discharge, to develop a concrete instance of the model to visualize more precise interdependencies and functional resonance.

3.8.2 Strengths

Despite the study's limitations, the novelty of its design and methodologies applied in the field of hospital discharge of the elderly has considerable merit. The main strength of the study is that FRAM was applied to facilitate a comprehensive analysis of hospital discharge of the elderly. Such approaches have previously been seldom used in healthcare (Robson 2013). I also used direct observation when describing everyday practices, rather than assessing work as conceived. The model was constructed using observations, to ensure its fidelity to reality. Real-time observational research has previously been applied only to a limited degree in determining the context and complexity of care transitions (Aase et al. 2013).

This study gathered empirical evidence from multiple patient cases, and the broad character of this examination enhances the reliability of the findings (Miles & Huberman 1994, Yin 2014). I collected and analysed a relatively large volume of qualitative fieldwork data, which provided a strong basis for the results. The broad sampling strategy provided detailed insights, permitting a description of hospital discharge from the perspectives of various stakeholders in hospitals and primary care. In comparison, previous research has tended to focus on the experiences of isolated stakeholders and professional groups. Multiple settings also

provided a strong basis for the results and allowed for control of context variability. This study focused on the elderly, a growing population that has generally received less attention in research (Knechel 2013, McMurdo et al. 2011).

I collected the data shortly after the implementation of the Coordination Reform in 2012, which provided valuable findings on changes, adaptations, and outcomes related to this reform. This allowed the opportunity to study how clinical environments adjusted to the new performance demands and helped identify possible emerging problems. Another methodological strength lies in the process of making the research activities structured and transparent. I have provided a comprehensive description of the various procedures, e.g., recruitment, fieldwork, data collection, and data analysis, so that others may understand, reconstruct, and scrutinize them (Miles & Huberman 1994). The findings therefore constitute a knowledge base that could be applicable to other settings in Norway, where the results or study design could be replicated and used for comparative research.

3.8.3 Alternative approaches

During the course of the study alternative approaches were considered useful to explore and increase the understanding of transitional care and hospital discharge. The alternatives include work analysis methods such as process mapping, appreciative inquiry and various observational approaches.

Process mapping is a modelling technique commonly applied in healthcare to understand the nature and content of work (Anthony et al. 2005). It is a quality improvement tool that is designed to look for opportunities for improvement by visualising the existing state, so problems can be identified. It can capture the reality of a process and identify duplication, variation, and unnecessary steps. Compared with, for example, more resource-intensive ethnographic approaches, it provides a relatively simple graphical representation of how work unfolds in practice (Sujan et al. 2014). Several studies have applied process mapping within transitional care research (Greenwald et al. 2007, Trebble et al. 2010, Johnson et al. 2012, Sujan et al. 2014). For

example, Trebble and colleagues (2010) examined the patient journey, finding that the use of process mapping to follow an individual's progress through the system helped practitioners to understand how their actions were viewed by patients, and the outcome of those actions.

Appreciative inquiry is both a philosophy and a methodological approach that focuses on what works in a system, and uses it as a basis for improvement (Helms et al. 2011). Several studies have explored care transitions using this method (Shendell-Falik et al. 2007, Clarke et al. 2012, Scala & Costa 2013). Appreciative inquiry shares close similarities with central aspects of RE and FRAM. For example, it is concerned with the study of work as conducted and values the strengths of individuals in the system. It was, however, developed to nurture organizational change, and was originally applied in businesses to improve organizational culture, efficiency and profit margin (Carter et al. 2007) rather than safety.

There are also several observational approaches that could improve the understanding of hospital discharge of the elderly. For instance, Abraham and colleagues (2012) developed a clinician-centred approach to gain a holistic perspective of the care transition beyond the information transfer aspects. It uses multiple methods, with shadowing as the main means of data collection. Shadowing is following someone, wherever they are, and whatever they are doing (Arman et al. 2012). In this case, it was used to provide a detailed record of events in a clinical workflow. The on-call resident was closely followed during one entire shift, to gather data on patient care and patient flow activities (Abraham et al. 2012). A major challenge of shadowing is that the research may become very sympathetic to the shadowed person's views and problems. Shadowing of patients and families may be used to evaluate their experience throughout a care process.

Another method, called "structured observation", was developed by Henry Mintzberg (1971) to understand the nature of managerial work. It is concerned with the study of everyday work and identification of activity patterns throughout a working day. This approach has been criticized for its narrow emphasis on behavioural frequencies and time consumed by managerial behaviours, and its failure to demonstrate the

interrelatedness of purposes with various activities (Snyder & Glueck 1980).

Despite the existing alternative methodological approaches I chose to employ moderate participant observations in phase 2 of the study (Dewalt & Dewalt 2011). The approach allowed me to view hospital discharge practices from different perspectives including a real-time account of the interrelations and complexities involved. Furthermore FRAM is a qualitative method allowing use of multiple data collection methods such as interviews, focus groups and observations (Hollnagel 2012a). In this study, observational data were analysed to identify common hospital discharge functions, variability and performance-shaping factors. This could have been accomplished by using individual interviews or focus groups with key stakeholders. Focus groups offer a quick and convenient way to collect data from several people simultaneously (Kitzinger 2006). They are particularly useful for stimulating discussion among participants, because individuals can present their point of view, be made aware of alternatives and comment on their experiences (Kitzinger 2006). In the context of hospital discharge, however, with the diversity and heterogeneity of stakeholders, and hierarchical boundaries (e.g., professional status), focus groups were not considered advantageous. As well as challenges of group composition, it would also have been difficult to find a suitable time for all participants to meet.

Based on the theoretical underpinning of resilience, I suggest that observational methods are a suitable primary source for collecting data when exploring *work as done* as opposed to *work as imagined*. Hollnagel (2014), however, asserted that interviews should be the primary source of information about work as done, with observations as a secondary source. Interviews, though, are retrospective recollections of events and therefore not effective in capturing the nuances of interactions and contextual elements. They elicit descriptions and interpretations that are constructed and separated from the time and place in which the events took place (Silverman 2001).

3.8.4 Procedures applied during fieldwork

Some adjustments to the procedures and techniques applied during data collection and fieldwork might have been appropriate. Using an observation team with a minimum of two researchers with different backgrounds could have improved the data collection. It would have added to the richness of the data, enabled comparisons to be made, and enhanced confidence in the study findings. One option would have been to use two researchers with different backgrounds to cover different discharge cases or conduct the observations as a team. This would have allowed a case to be viewed from different perspectives. Two researchers could also have better covered the complexity of the observational setting by following key informants (i.e., nurses, doctors, patients, patient coordinators) over longer periods of time. This advantage should, however, be weighed against the possible negative effects of having several researchers present simultaneously. This could increase the observer effects and potentially limit the study.

The interviews could also have been conducted after a thorough analysis of the observational data using FRAM. The interviews could then have been used to validate and support the FRAM analysis. The experience of applying FRAM in a healthcare setting will be covered in Chapter 5.

4 Summary of results

This chapter briefly describes the progress of the study in this thesis. It also presents each of the five papers' aims and findings to address how they relate to the study objectives and research questions.

4.1 Study progress

Table 4 displays the time frame of the thesis and summarizes its progress. In 2011, I developed the study design: the research strategy, methods, data collection tools, and selection of setting, samples, and inclusion criteria. I prioritized ethical approval and access to the field settings. I conducted the literature reviews (Papers I and II) to help support the empirical study and development of data collection tools. Data collection was the main activity in 2012 while data analysis, the study protocol (Paper III), and the two empirical manuscripts (Papers IV and V) were conducted in 2013. In addition, I went abroad for approximately 2 months during 2013 as a visiting scholar at the University of Nottingham, United Kingdom. In 2014, I wrote the thesis synopsis and made submissions and reviews of the two empirical manuscripts (Paper IV and V).

Table 4: Time frame and progress of the PhD study

Progress	**2011**	**2012**	**2013**	**2014/2015**
Main activity	Study design, ethical approval, literature reviews	Data collection	Data Analysis Visiting Scholar (University of Nottingham)	Thesis synopsis Publications/Reviews
Results	Paper I: Review-risk factors Paper II: Review-Interventions	Paper III: Study protocol Paper IV: Hospital discharge of the elderly – an observational case study of functions, variability and performance shaping factors Paper V: The demands imposed by a healthcare reform on clinical work in transitional care of the elderly		Thesis submission
Research questions	(a) What risks are identified in the literature related to transitional care of the elderly? (b) What interventions are identified in the literature to address these risks?	(c) What methodological approaches are suitable for providing an increased understanding of transitional care? (d) What characterizes hospital discharge of the elderly to follow up in primary care services and why does discharge performance and outcomes vary? (e) How does the hospital discharge system adapt to its contextual environment and what are the implications of these adjustments?		

4.2 Paper I

This paper has been published as 'Addressing risk factors for transitional care of the elderly—Literature review' (Laugaland et al. 2011). The objective of this paper was to identify risks related to transitional care of elderly patients, thereby addressing research question (a) (see section 1.3). The findings indicated that research in this area has largely been concerned with adverse events that occur with transitions in hospitals; the results also showed a lack of evidence for adverse events in transitions that occur in the post-discharge period. Despite the lack of research, current evidence indicates that adverse events occur frequently; it has been suggested that one in five patients (20%) suffers an adverse event related to the transition from hospital to home (Forster et al. 2003). It appears likely that the rate of adverse events increases with the patient's age owing to the complex care needs that make elderly patients a vulnerable group. The severity of the adverse events varies from laboratory abnormalities to permanent disabilities and death. Medication discrepancies constitute the main type of adverse events that occur in transitional care of elderly patients. Other adverse events are related to failure to follow up on procedures suggested or scheduled: these are work-up errors and failure to follow up on test results, e.g., laboratory tests and radiological studies, pending at the time of discharge. Poor or deficient communication between hospitals and primary-care providers was the commonest contributor to the adverse events.

Paper I thus details how multidisciplinary collaboration and effective communication of information are vital components during transitional care and hospital discharge of elderly patients. The paper recognizes transitional care and hospital discharge as an area of concern for elderly patients, and it addresses the need and rationale for further research.

4.3 Paper II

This paper has been published as 'Interventions to improve patient safety in transitional care—A review of the evidence' (Laugaland et al. 2012). This paper addresses research question (b) (see section 1.3) and it

involves a review of interventions designed to address the risks related to transitional care of elderly patients. To develop an overview of current interventions was done to map possible approaches that could be beneficial for the hospital discharge practice field, to mirror the focus of the current approaches reported in the literature, and to inform the empirical part of the study (Phase 2).

The intervention types identified in paper II included the following: profession-oriented interventions (i.e., education and training); organizational interventions (i.e., those related to the transfer nurse, discharge protocol, discharge planning, medication reconciliation, standardized discharge letter, and electronic tools); and interventions oriented to the patient or their next of kin (i.e., patient awareness and empowerment, discharge support).

It is possible to distinguish between pre-discharge and post-discharge interventions. Pre-discharge interventions are those that mainly take place during hospital admission. Post-discharge interventions are those that largely occur after hospital discharge and include home visits and follow-up phone calls. Post-discharge interventions are particularly focused on medication reconciliation and adherence, appropriate ambulatory follow-up, and monitoring symptoms. A common finding with several studies was that combining hospital discharge preparation and planning with discharge support provides better results than interventions that are provided only in the hospital or community setting. The literature review in Paper II found that few studies have adopted a multidisciplinary approach involving numerous stakeholders. Interventions often appeared to focus on single groups, such as nurses, physicians, patients, or families.

In summary, Paper II found that several attempts to improve transitional care for elderly patients have been initiated, though current evidence is scant and inconclusive. The review did not provide evidence for the validity of one intervention over another. The findings further revealed that interventions seldom undertake a multidisciplinary approach involving numerous stakeholders and multiple components which may indicate why some of the existing interventions have failed to deliver sustainable improvements.

4.4 Paper III

This paper has been published as 'Quality and safety in transitional care of the elderly: the study protocol of a case study research design (phase 1)' (Aase et al. 2013). This paper addresses research question (c) (see section 1.3) and it describes the design and data collection tools of the overall research project. The paper defines the exploratory phase (Phase 1) of which this thesis forms part. Paper III provides the rationale for the study design, sample, and methods applied. The findings of Paper III indicate that studies on transitional care have primarily applied such methods as individual interviews or focus-group interviews with patients and professionals. The use of observational methods has been less common in studies of transitional care. Most studies have been concerned with examining information dynamics and communication processes.

Paper III thus highlights the uniqueness of the design and methodological approaches of the study in applying real-time observations that incorporate multiple stakeholder perspectives. The paper emphasizes the need for methodological approaches that contribute to contextual knowledge and increased understanding. The paper supports the design of an intervention program to enhance quality and safety in transitional care of the elderly (Phase 2 in the overall research project).

4.5 Paper IV

This paper has been published as "Hospital discharge of the elderly—an observational case study of functions, variability and performance shaping factors" (Laugaland et al. 2014). It addresses research question (d) (see section 1.3), and reports an observational case study of hospital discharge practices. The main aim of the paper was to identify generic functions essential to the hospital discharge process, and explore variability and performance-shaping factors (PSFs). It incorporated multiple stakeholder perceptions of healthcare providers in hospitals and primary care, patients and their next of kin. Paper IV presents the practical application of FRAM to examine, analyse, and model the essential characteristics (i.e., functions) involved in hospital discharge

practices. It also details how performance variability was identified and analysed in discharge practices, and illustrates how FRAM can potentially be used within healthcare. This methodological approach provides a detailed, systematic and comprehensive understanding of hospital discharge practices, which has not previously been described in the literature.

Through the use of qualitative observational data and application of FRAM, Paper IV demonstrates that hospital discharge is a complex multiagency care process composed of numerous activities and multiple goals. This paper provides a detailed insight into 10 common functions performed during hospital discharge:

- Review of hospital inpatients, classifying patients that are medically fit for discharge;
- Notifying the municipality that the patient is medically fit;
- Informing the patient that they are ready for discharge;
- Assigning an appropriate post-discharge site of care and notifying the hospital;
- Notifying and informing the patient's next of kin (if any);
- Preparing a nursing discharge record;
- Preparing a medical discharge letter;
- Providing oral information about the transfer to post-discharge care providers;
- Ordering transportation; and
- Transferring the patient to the post-discharge site of care and ensuring the transfer of written information.

The paper indicates that the review of hospital inpatients to determine whether a patient is medically fit for discharge is the most critical function, as this activates the overall discharge process and affects all subsequent functions by determining when they are initiated. Paper IV thus illustrates the strong degree of interrelatedness between the discharge functions, highlighting variability and vulnerabilities arising out of functional dependencies. It suggests the need for corresponding multicomponent interventions, and also points to the necessity of

incorporating multiple stakeholder perspectives to share a common perception of what constitutes acceptable, successful discharge.

The paper also examines how the set of functions varies in terms of timing, duration and precision in performance. It provides insight into multiple and diverse performance-shaping factors attributed to a range of contextual features. These included variations attributed to temporal conditions (i.e., degree of time pressure) surrounding the discharge process; the characteristics of the individuals and care team involved (doctors, nurses, other members of the care team and their approach, preferences, risk awareness, decision-making criteria, communication and team skills); variability in patient factors (i.e., resources, preferences, cognitive or mental status, disabilities, communication skills, complexity of care); organizational factors (i.e., the unit, specialization, work organization, leadership, institutionalized routines); and local work environment factors (i.e., bed availability, familiarity with the patient, current availability in municipal services, simultaneous responsibilities, quality of the discharge planning process, and degree of pressure from the next of kin) and regulatory influences (financial incentives). Paper IV therefore emphasizes that hospital discharge performance is highly sensitive to multiple interacting variables and variation in context.

4.6 Paper V

This paper has been published as 'The demands imposed by a healthcare reform on clinical work in transitional care of the elderly: A multi-faceted Janus' (Laugaland & Aase 2015). It addresses research question (e) (see section 1.3), and focuses on the adaptation of everyday clinical work to the demands imposed by the Coordination Reform of 2012. This was implemented to promote better coordination of primary and secondary healthcare services in Norway. The paper reports from the observational study and a selection of individual interviews conducted with healthcare personnel in hospitals and primary care facilities. It illustrates how a system reform affects discharge performance, how clinical environments adjust their functioning to meet a new set of demands, and how the outcomes of these adjustments are experienced by different stakeholders. The paper highlights some pertinent

characteristics of everyday clinical work, such as the conflicting goals of managing the demands of both system and patients.

Paper V makes clear that the outcome of hospital discharge of the elderly to follow-up care in the municipality is multifaceted and varies depending on the point of view. From a hospital perspective, outcomes of the adjustments imposed by the reform were perceived mainly as successful. Hospital personnel reported improved discharge planning, closer dialogue with primary care, increase in time efficiency on the day of discharge, decrease in delayed discharges and better bed availability. From a primary care perspective, however, the picture was more nuanced and outcomes were perceived as variable and sometimes problematic. Healthcare providers in primary care described an unpredictable post-discharge period and increased complexity of care patterns following the reform (e.g., increase in number of transitions and increased demands requiring coordination between care sites). The adjustments often had negative effects for the elderly and their next of kin. The elderly were poorly involved in the discharge planning process and the increase in number of transitions post-discharge posed mental and physical challenges for them. The empirical findings therefore suggest the need to identify acceptable, successful outcomes in hospital discharge practices. Paper V stresses the necessity to consider both short- and long-term consequences (outcomes) when assessing practices.

4.7 Relationships between the papers

Paper I identifies risk factors in transitional care of the elderly. It focuses on identifying what goes wrong (adverse events), although resilience thinking underscores the value of studying what goes right. Resilience thinking, however, makes clear that this approach has to be viewed as a complementary contribution to safety, in the form of preventing adverse events. It also emphasizes the importance of being aware of what goes wrong to learn from it (Hollnagel et al. 2013). Identifying and gaining an understanding of the types, frequencies, causes, and consequences of adverse events related to transitional care is critical to preventing such events in the future.

Papers I and II are based on an approach that involves identifying adverse events, cause-effect relations (Paper I), and interventions designed to address them (Paper II). These papers therefore contribute to the design of the empirical study (Phase 2). They also form the basis for the theoretical and methodological orientation and study design in Paper III.

The empirical study (Phase 2) employed a proactive approach in studying everyday activities. It focused on work as actually carried out in discharge practices (Paper IV) and adaptations and implications following a system reform (Paper V). Through the application of FRAM, Paper IV provides a detailed understanding of hospital discharge practices for the elderly, which is considered a prerequisite for that system to be analysed within the resilience perspective. Paper V further explores central concepts and terms within the resilience perspective by studying adaptations and adjustments in the face of change (i.e. the Norwegian Coordination Reform,2012), which is considered fundamental in this context.

5 Discussion

The overall aim of the thesis has been to examine and extend current knowledge, improving understanding of transitional care and more specifically of the functioning of hospital discharge of the elderly, its characteristics, variability, and performance-shaping factors. It has primarily been concerned with investigating the risk factors associated with transitional care, interventions designed to address those risk factors, and the actual functioning of hospital discharge practices for the elderly. It has also empirically studied the adaptations made in a clinical environment following a system reform that affects the hospital discharge system. In this chapter, I will discuss the main contributions and implications, under the following subsections:

(1) Application of FRAM
(2) Addressing the knowledge gaps
(3) Adaptations to change
(4) Monitoring transitional care
(5) Implications for policy, practice, and future research

5.1 Application of FRAM

There are several implications related to applying the Functional Resonance Analysis Method (FRAM) to hospital discharge of the elderly to follow-up care in municipal services. I will first discuss FRAM's utility, value and contributions, followed by its limitations as applied in the healthcare context.

5.1.1 Contributions

Applying FRAM within the area of hospital discharge is new to the literature on care transitions. It has generated insight into:

- the actual functioning of the hospital discharge system;

- the characteristics (functions) involved in hospital discharge of the elderly, patterns of variability and key performance shaping factors; and
- the functional interdependencies/couplings that exist.

Using FRAM, based on observational research of various discharge practices, has allowed systematic analysis of and insight into the current discharge system in Norway. Information about the actual functioning of a system is a key factor in resilient healthcare (RHC), and a requirement for a proactive approach to safety work (Hollnagel 2012a, b). Based on the FRAM analysis, this thesis has examined how hospital discharge is organized, by identifying common patterns of the functions involved (Paper IV). The research has explored the actual variability in those functions. In the process, we have added to the knowledge about the typical and expected variability that occurs in discharge practices with the elderly. We have also identified key performance-shaping factors that affect and shape discharge practices.

Finally, the application of FRAM has identified the interactions in the discharge system as shown in Paper IV. This paper shows the richness of interdependencies between and within the discharge functions, highlighting vulnerabilities arising out of functional interdependencies.

5.1.2 Challenges

FRAM is a relatively new method, not originally developed for application in healthcare (Hollnagel 2012a). Its use in the context of hospital discharge has revealed some important challenges with its scope. For instance, the final step of the FRAM analysis consists of proposing ways to manage the possible occurrence of uncontrolled performance variability, which may lead to adverse outcomes (Hollnagel 2012a). Identifying and agreeing on the points where local variations (such as those produced by time pressure and other contextual circumstances) cannot be allowed demands a common understanding of acceptable, successful outcomes, in this case of hospital discharge. It is difficult to discuss uncontrolled performance variability until stakeholders share a common understanding of what constitutes successful or acceptable performance.

Empirical findings (Papers IV and V) illustrated that the various actors (healthcare providers, patients, next of kin) have different concerns and use various process and outcome measures to evaluate and assess the degree of successful discharge functioning. The elderly often express their concerns about their state of health (functional level) on the day of discharge and during the preparation period. Their next of kin voice concerns about post-discharge arrangements. Their assessments appear to reflect the degree of compliance with their requests about level of care and the care provided. Primary healthcare providers often express concern over temporal aspects of the discharge process (the time of day that the patient arrives at the post-discharge care site), the patient's health status, the discharge planning process, and the content and quality of the information provided. Healthcare providers in hospitals refer to the degree of compliance with discharge agreements, available and timely information, and the duration of the discharge process (degree of efficiency) as factors that influenced their assessment.

By incorporating multiple stakeholder perspectives, we therefore identified the need for *concept clarifications* related to FRAM. Variations in stakeholders' understanding of successful discharge performance and outcome complicate the idea of acceptable or successful functioning (e.g., precision in performance), and therefore the concept of an acceptable, successful outcome and uncontrolled performance variability. To build an evidence base around successful discharge practices, it is important to identify what process and outcomes measures are applied by various stakeholders to assess the degree of successful discharge functioning. Redesign efforts that focus on a single perspective or provider group have limited impact (Davis et al. 2012).

As discussed in Paper IV, FRAM does not appear to take into account the *multiple stakeholder perspective* that exists in healthcare. The importance of viewing the system through multiple perspectives to obtain an overall understanding is emphasized in the resilience literature (Clay-Williams 2013). The use of FRAM can appear to favour the clinicians' perspective without acknowledging that of patients and their next of kin. This is a major limitation in applying FRAM in healthcare. The importance of understanding the discharge process from multiple perspectives has been emphasized (e.g., Toscan et al. 2013). There is,

however, limited understanding and documentation relating to transitional care from the perspective of patients and their next of kin.

FRAM is a method primarily developed for interpretation of dependencies and functional resonance within a system, and not specifically designed to explore stakeholder perspectives. Thesis findings strongly suggest that FRAM has potential when applied to healthcare. One alternative that would allow incorporation of patient and next of kin perspectives is to introduce the concept of *work as experienced* by patients and next of kin into FRAM terminology.

5.2 Addressing the knowledge gaps

Three important contributions to knowledge have been generated by the empirical findings in this thesis: (1) the importance of context; (2) the complexity surrounding hospital discharge functioning; and (3) the inherent trade-offs associated with hospital discharge.

This thesis has demonstrated that performance variability during hospital discharge is common and that it is determined by multiple factors (situational, organizational, individuals, teams, patients, next of kin, regulatory influences) and interdependencies. Papers IV and V emphasize how key performance-shaping factors potentially explain the variability. Those factors are linked to a range of contextual features (see section 4.5)

This thesis expands our understanding of the challenges presented by transitional care and hospital discharge. Researchers have thus far approached these without considering the context of care (Geary & Schumacher 2012). There is agreement that understanding the contextual factors that influence performance is essential, but the area has received limited attention (Dollarhide et al. 2013, Stevens & Shojania 2011, Taylor et al. 2011, Abraham et al. 2012, Hilligoss & Choen 2013). The empirical evidence in this thesis emphasizes the importance of a multifaceted understanding of contextual issues and performance-shaping factors in improving hospital discharge practices.

In line with this, the thesis provides insight into the complexity associated with hospital discharge. The empirical evidence presented in Papers IV and V reflects the interconnections between functions and stakeholders; it is not related simply to individual functions or individual stakeholders. The application of FRAM advances understanding of the complexity surrounding and affecting hospital discharge of the elderly, by emphasizing the interactions and relationships in the system.

The empirical findings suggest that the current sequential approach to the complexity of care transitions is inadequate. Interactions and interdependencies exist, and corresponding multi-component interventions are therefore necessary (Dhalla et al. 2012, Laugaland et al. 2014, Storm et al. 2014). In line with other studies (Coleman 2006, Dhalla et al. 2012), Paper II indicates that positive outcomes are more apparent from interventions provided in both care settings—hospital and municipal services—than in only one or the other.

The FRAM analysis in Paper IV shows that hospital discharge consists of multifunctional activities and multiple goals. It therefore provides insight into the inherent trade-offs in hospital discharge. Paper V also discusses the pertinent characteristics of everyday clinical work: the dual—and sometimes conflicting—goals of managing the demands of both system and patients. The study identifies a major shift in discharge practices following the Coordination Reform with its associated financial penalties. These have led to increased time pressure and efficiency on the day of discharge. The variability observed and experienced in discharge practices may therefore be the result of trade-offs between efficiency and thoroughness (Hollnagel 2009b). Healthcare often operates at the margin of acceptable performance to minimize economic cost and workload (Jeffs et al. 2009). Pressure to increase efficiency may push the operating point towards the boundary of acceptable performance (Dekker 2011). Dekker (2011) emphasized that one of the ingredients in almost all stories of drift is the focus on productivity and efficiency. According to Hollnagel (2009b), it is not possible to maximize efficiency and thoroughness at the same time, and healthcare providers usually favour efficiency. The evidence in this study suggests that efficiency in hospital discharge practices may come at the expense of involvement of the patient and their next of kin, particularly

in discharge planning and post-discharge arrangements. Paper V argues that the adjustments made to sustain an efficient discharge system seem to come at the cost of the patients and their next of kin. Discharge for the elderly is a sudden and sometimes unexpected experience, which leads to insecurity, stress, and anxiety. Paper V stresses that the trade-offs inherent in hospital discharge need to be acknowledged and discussed.

5.3 Adaptations to change

Understanding how a system adapts to change reflects the essence of resilient healthcare and is a key part of the concept (Hollnagel 2012a, Hollnagel et al. 2013). Adaptive capacity refers to the ability of a system to effectively adjust and cope with change (Martin-Breen & Anderies 2011). Paper V empirically examines the adaptive capacity of a clinical environment towards a new system reform (Report to Parliament no. 47 2008-2009). It also investigates how the outcomes of the adjustments are experienced, by incorporating a multiple stakeholder perspective.

A main objective of Norway's Coordination Reform was to solve the problems related to delayed hospital discharges in specialist care and achieve more seamless transitions (Report to Parliament no. 47 2008-2009). The reform applies financial incentives, which are a commonly used tool, to reduce patients' length of stay (Manzano-Santaella 2011). Adaptations can occur at all levels of an organization and affect all parts of a system (Rankin et al. 2013). Adjustment to the demands imposed by the Coordination Reform does not appear to have worked equally well in different settings. The outcomes of those adjustments are perceived as successful by hospital staff, but the picture is more nuanced in primary care, and outcomes are perceived as variable, sometimes problematic. Adaptive performance can yield positive effects in one system while affecting another part of the system negatively (Rankin et al. 2013). The multifaceted outcomes of the adjustments imposed by the Coordination Reform are confirmed by the findings in another recent study (Grimsmo 2013). A comparison of those two studies shows that the following outcomes were similarly reported:

- The number of delayed discharges has been reduced following implementation of the reform;
- The amount of information exchange between hospitals and municipalities has increased, leading to more administrative work;
- The elderly experience several transitions during the post-discharge period, leading to less continuity and more complex transitions;
- Patients living at home with corresponding care needs are, to some extent, overlooked to avoid financial penalties by prioritizing patients ready for discharge; and
- Alternative solutions are used in some municipalities to increase flexibility, e.g., placing the elderly in the nursing home corridor, and changing single to double rooms.

Financial measures have had a beneficial effect in reducing delayed discharges among the elderly. National data confirm the positive picture: delayed discharges from hospitals were reduced by nearly 50% in 2012, following implementation of the reform (Helsedirektoratet 2014). This thesis has reported considerable variation in outcomes of hospital discharge practices, suggesting that the perspectives of the authorities is only one component in the hospital discharge process. It is also necessary to examine the costs and requirements of compliance.

Empirical evidence (Laugaland & Aase 2015, Grimsmo 2013) suggests that the adaptations made by municipalities to avoid delayed discharges and financial penalties have led to an increase in the complexity of care patterns and multiple transitions in the post-discharge period. This has led to more interfaces, fragmentation, and potential communication problems. The result is new vulnerabilities and the potential for adverse events (Coleman 2003, Naylor & Keating 2008, Holen-Rabbersvik et al. 2013, Trueland 2013). Changes in the environment of the elderly have been found to increase the risk of falls, delirium, and infection transmissions, as well as increased mortality (McCusker et al. 2001, Krumholz 2013, McMurdo & Witham 2013). Following the adaptations made to address bed blocking in specialist care, the elderly have to adjust to potentially new or complex health situations, changes in their ability

to self-care after discharge, and changes in care providers. The adaptations have therefore produced undesired consequences.

Paper V shows that clinical environments have been able to adjust to the new demands imposed by the Coordination Reform (Report to Parliament no. 47 2008-2009) and sustain their functions. The current system, however, appears to contribute to increased vulnerability for the elderly post-discharge. Resilience has therefore increased in one system, but may have decreased in another (Rankin et al. 2013), by introducing increased demands on primary care. This complicates the idea of successful functioning and outcomes related to hospital discharge. This thesis indicates that policies, regulations, and the implementation of new reforms can create unforeseen consequences and new vulnerabilities. These may pose a threat to patient safety even though the initial aims were designed to improve safety and patient outcomes (Woods et al. 2006, Rankin et al. 2013).

Another central aim of the Coordination Reform was to reduce unnecessary hospitalization, which was a significant area of inefficiency in the previous system (Rutherford et al. 2011). The findings suggest that financial measures can lead to under-prioritization of patients living at home in the receiving municipality. This finding was confirmed by Grimsmo (2013). This result may pose challenges for preventative primary care. Prioritizing patients ready for discharge at the cost of patients living at home may cause an increase in hospital admissions. In studying adaptations to change, it is necessary to pay closer attention to the interdependencies across system boundaries (Waterson 2009, Storm et al. 2014, Laugaland & Aase 2015). Paper V stresses the importance of studying the effects of healthcare reforms, including investigating effects within and across care levels from different stakeholder perspectives.

One strategy that systems can use to remain resilient when managing shifting demands and trade-offs is the creation and maintenance of margins of manoeuvre (i.e., possibilities for adaptation to additional demands). This includes better use of capacity (i.e., actions or additional resources to deploy new ways of functioning) to allow the system to remain efficient (Stephens et al. 2011). Three types of strategies for re-organization can be used to maintain adequate margin for manoeuvre.

These are external, where one unit or part of the system borrows margin from another, internal, which requires local reorganization within one unit or part of the system, and cooperation, sharing margin with other units or parts of the system (Stephens et al. 2011).

Papers IV and V illustrate how these various strategies have been used. When primary care providers did not have capacity to receive patients who were ready for discharge, they tried to negotiate and delay the discharge process. In other words, they tried to borrow margin from the hospital. The hospital could borrow capacity from primary care by bringing forward the medical fitness decision and accelerating the discharge. This strategy could potentially adversely affect the margin for the receiving municipality and increase the risk of re-admissions. Papers IV and V show a major shift in time efficiency surrounding the hospital discharge system following the demands of the Coordination Reform. This was emphasized by healthcare providers as a potential vulnerability contributing to poor performance, including suboptimal discharge planning, inadequate involvement of patients and their next of kin and deficiencies in information transfer. The various hospital wards could therefore benefit from a local reorganization strategy where they change their internal processes for discharge practices to increase their margin of manoeuvre.

These findings emphasize the need to employ a cooperative strategy across hospital and primary care to benefit the system as a whole. Through coordinated, collective action, the two parts of the system would recognize and create a common pool of resources on which both could draw (Stoop 2011). This could allow better coordination of discharge timing. It might also be helpful to evaluate the time limits currently applied and perhaps postpone financial penalties until the day after the medical fitness decision. In this case, the hospital has control over the medical fitness decision while the municipality has financial responsibility for receiving patients. The hospital therefore has more ability to maintain an uneven margin distribution at the expense of primary care (Stephens et al. 2011).

Paper V shows how the discharge system "stretches" to handle an increase in demand (Woods & Wreathall 2008). Following the

Coordination reform, several measures were initiated by the municipalities to increase flexibility, and avoid discharge delays and financial penalties. These measures are set out in Paper V and involve inter-municipal collaboration (e.g., sharing of margin), establishment of an interim ward, and removal of alternating beds (stealing margin). These adjustments indicate second order adaptation, where the system must reorganize to absorb and accommodate new demands, to sustain efficient functioning.

5.4 Monitoring transitional care performance

One of the cornerstones of resilience is a system's ability to monitor its own performance (Hollnagel 2009a). This includes recognition of adjustments and corrective actions (Hollnagel 2013b). The ability to respond depends on the ability to monitor (Hollnagel 2009a), which in the case of transitional care requires mapping of performance. Performance indicators are designed to provide continuing information about performance and the functioning of the system (Woods & Wreathall 2008). If there are no appropriate indicators, poor performance will be ignored (Coleman & Fox 2004).

Performance measures or indicators enable professionals and organizations to monitor and evaluate what happens to patients as a consequence of the functioning of professionals and organizational systems (Mainz 2003). It is, however, a major challenge to establish indicators that provide information to anticipate performance and events before they occur, i.e., to be leading rather than reactive, or 'lagging' (Reiman & Pietikainen 2012). Many hospitals and healthcare providers are overwhelmed by data and may see little appeal in adding more to capture safety problems (Shojania 2010).

The outcome of a FRAM approach can form the basis for proposing targeted indicators. Monitoring transitional care performance, however, raises several questions. What performance should be monitored? Which data sources should be used? Should performance be measured from the perspective of the patient, the sending care team, the receiving care team, or the broader healthcare system (Coleman 2006)? These questions must

be addressed, since the indicators used determine what issues are regarded as important (Reiman & Pietikainen 2013).

Paper I showed a lack of ways to measure performance among levels, organizations, and professions (Laugaland et al. 2011). Most existing indicators focus on the performance of single episodes of care (Mountford & Shojania 2012) and on processes and outcomes within rather than across settings (Naylor & Keating 2008). Performance indicators designed to measure transitional care are necessary to ensure that all care providers are held accountable for the success or failure of a patient's transition (Coleman & Boult 2003, Mountford & Shojania 2012). The absence of measurement over different settings and organizational boundaries remains a significant barrier to improvement in this area (Coleman 2006). An important question to ask is who would own the measures or indicators or be held accountable when measures relate to 'between-ness'?

Reinforcing the patient's role in improving healthcare delivery is stressed as an important component in policy-making, regulation, and practice (Wiig et al. 2013). Patients and their next of kin and family members have traditionally been excluded, and represent an underused resource (Davis et al. 2013, Vincent et al. 2014, Robson 2013, Francis 2013). There are currently few tools and measures to record the experiences and roles of the elderly and their next of kin during transitions (Naylor & Keating 2008). This is a deficit, in contrast to the influential role played by the patient perspective in the political agenda in Norway (Foss & Askautrud 2010, Wiig et al. 2013). Some studies have found that patients can help identify and monitor performance as well as provide warnings about deteriorating care and safety-related events (Weissman et al. 2008, Schwappach 2008, Davis et al. 2013, Doyle et al. 2013, Francis 2013, Vincent et al. 2014).

The findings in this thesis clearly show that informal conversations with patients and their next of kin provide complementary and invaluable insight into the functioning of transitional care systems. In line with other studies (Doyle et al. 2013, Francis 2013, Vincent et al. 2014), this thesis strongly suggests that the experiences of patients and their next of kin

should be systematically gathered and used to identify warning signs and vulnerabilities.

The Norwegian government has emphasized the need to measure healthcare performance by developing and extending the use of indicators (St.mld. 10, 2012-2013). At present, discharge is only measured nationally by the use of a process indicator, the proportion of patient discharge letters sent within 7 days to the general practitioner (Helsenorge.no). Paper IV reported that the discharge letter was available for all observed patients at the time of discharge. Municipal healthcare personnel, however, noted that the letters were highly variable in quality. Some studies have identified poor communication and a lack of vital information transfer as a comprehensive problem and potential risk factor in transitional care (Garaasen, & Johnsen, 2007, Kripalani et al. 2007, Laugaland et al. 2011). Timely discharge summaries therefore appear to be an insufficient measure of discharge performance. This thesis emphasizes that the quality of the information transferred is equally important.

The current indicator of discharge performance may therefore be insufficient for several reasons, not least because it covers only one of several discharge functions. Given the interdependencies in hospital discharge, indicators should capture a wider picture of discharge performance. Performance indicators may be developed both for functions and for the interdependencies among them (Hollnagel et al. 2008). This thesis suggests that performance indicators should include the contextual issues that shape performance, but there is no agreement on what contextual elements are most influential (Shekelle et al. 2011). Paper IV makes clear that the unit of analysis had an effect on outcome, including satisfaction, decision-making criteria, and quality of information transfer. The receiving healthcare providers made more negative remarks about the process for patients discharged from orthopaedic wards than from medical, especially geriatric, wards. This indicates that transitional care is highly sensitive to variation in context. Hospital wards are specialized, and it may be necessary to devise more specific, subtle measures appropriate for individual clinical settings (Vincent et al. 2014).

5.5 Implications

The results of this thesis demonstrate the complexity surrounding the functioning of systems for care transitions. This needs to be acknowledged and taken into account by policymakers, practitioners, and researchers.

5.5.1 Policy

Assessment of the consequences of change

The findings in this thesis call attention to the need for policymakers to make an open assessment of the potential consequences of regulation and change and to closely monitor the short- and long-term effects across care levels and system units. Healthcare planners and reform makers should take complexity and interdependencies sufficiently into consideration (Raisio 2009).

Sweden, Denmark, and England have similar incentives to those in Norway to address the issues of delayed discharge and bed blocking. However, Norway appears to be the first country to make the financial responsibility mandatory and effective on the same day a patient is considered ready for discharge (Swanson 2013). In England, social services are given 24 hours to organize a patient's discharge after they have been determined medically fit by the hospital (Manzando- Santaella 2011). In Sweden, primary healthcare is given 5 days after the patient is determined medically fit (Otterstad 2011). The findings in this thesis suggest the need to examine more specifically the role that finance plays in generating successful outcomes or unintended consequences.

5.5.2 Practice

Monitoring performance

The results of this thesis emphasize the importance of the clinical environment in monitoring its performance as an ongoing activity. Unless clinicians, organizations, and institutions take ownership and

play an active role in measuring their performance, there will be little progress (Mountford & Shojania 2012). The best-performing healthcare organizations monitor their performance proactively in respond to demand. For such organizations to learn and adapt, their factual functioning needs to be transparent (Stoop 2011), allowing information on performance and outcomes to be shared with staff, patients, and the public.

Collecting data from a variety of sources

Before finding appropriate indicators or measures, it is first necessary to establish the current status (Hollnagel 2012a). This calls for greater emphasis on actual inspections and walk-arounds than on self-reporting. It is necessary for clinical units to gather empirical evidence from a variety of sources on how their system functions (Hollnagel 2011). Data sources can include the following: incidents reported; patient safety indicators derived from administrative data; complaints; health and safety incidents; inquests; claims; clinical audits; routine data; observations; and informal conversations with patients, their next of kin, and staff (Vincent et al. 2014).

This thesis indicates the need for an increased focus on monitoring transitional care performance locally; hospital wards and primary-care services have to develop performance indicators relevant to their domain and specialty. Hospitals and municipalities should collaborate and follow patients and their next of kin post-discharge to assess their experiences and satisfaction with care; this will help in identifying and monitoring performance and safety-related events. Such feedback should be subject to learning and local improvement efforts. It has been found that post-discharge feedback provides a reliable impression since patients have had time to reflect on their experience (Coulter et al. 2009).

5.5.3 Research

This thesis suggests that further theoretical and empirical development needs to be made to develop, extend, and improve transitional care practices of the elderly. The main implications of the research presented in this thesis are presented below.

Resilience in healthcare from a CAS perspective

The results of this thesis support the view of healthcare as a CAS, in which performance is not always predictable and functions are interconnected. Transitional care of the elderly takes place in a changing environment, with ongoing interactions among stakeholders and the context; this implies the need for adjustments and adaptations. It is necessary to examine multiple factors, interdependencies, interactions, and their effects with respect to a range of discharge outcomes, incorporating various stakeholders. The findings of this thesis indicate that it is better to avoid clear-cut systems and concentrate instead on the interconnections within and among systems. Future research should aim to identify direct links among specific functional dependencies, conditions, and performance or patient outcomes.

Multiple stakeholder perspective

The results of Paper V underline the necessity of healthcare resilience towards integrating a multiple stakeholder perspective as part of the framework. The various perspectives of the actors involved need to be taken into account to form a comprehensive picture and reach a common perception of what constitutes acceptable, successful discharge functioning. Thus, there is a need to revise and adjust FRAM to better fit the complexity of healthcare in the form of multiple stakeholders. There is a need for research to find the best strategies to successfully encourage patient involvement in this development (Davis et al. 2013).

Multi-component interventions

With regard to the multiplicity of stakeholders and complexity surrounding hospital discharge, the results of this thesis suggest that improvement efforts should take into account multi-component or multifactorial interventions. Interventions should furthermore undertake a multidisciplinary approach to a greater extent.

Performance-shaping factors and the role of context

Future research needs to pay closer attention to an examination of performance-shaping factors using a layered approach to contextual

analyses. Future studies should identify the dominant performance-shaping factors in different contexts. Research efforts need to gain insight into critical functions and key performance-shaping factors towards reducing uncontrolled performance variability in care transition practices. Future research should also explore additional functions that are essential for specific patient groups.

Regulatory influence on performance

Future studies need to determine how adaptations to policy and external demands affect performance and potential vulnerability in the healthcare delivery system. Little research has been devoted to the dynamics across system boundaries, linking decisions, policies, and changes by means of different levels of analysis (Waterson 2009).

Intra- and international comparative research

Through the application of FRAM, this thesis has identified common discharge functions in a Norwegian context. However, the study was conducted in only two Norwegian hospital regions. Caution thus needs to be exercised in generalizing these findings to other Norwegian hospital regions and to other countries. These findings can be replicated and used for intra- and international comparative research. Comparing the way functions are actually conducted provides a basis for understanding performance variations over time and with different hospitals and countries (WHO 2000).

6 Conclusion

This thesis has identified gaps in knowledge and in the literature by investigating transitional care practices for the elderly from a resilience perspective. Previous research has primarily focused on isolated aspects of transitional care or the experiences of single stakeholders. This thesis has applied an integrated approach to the study of transitional care and more specifically hospital discharge to produce a more comprehensive understanding of the processes involved and the influence of contextual issues. In this section, I will conclude by answering the research questions that directed the study.

a) What risks are identified in the literature related to transitional care the elderly?

The literature review revealed that previous research has largely focused on the risks of adverse events occurring within a hospital. There are few studies on the extent of adverse events taking place post-hospital. Despite the absence of extended evidence, it is clear that transition from hospital to home is an error-prone transition in care, especially for the elderly. Adverse events reported in the literature are drug- and procedure-related problems, diagnostic test follow-up errors, nosocomial infections, and falls. The commonest issues were inadequate and poor communication, a lack of holistic thinking, and unclear responsibility.

b) What interventions are identified in the literature to address these risks?

The literature review identified a set of interventions that have been suggested to address current risks related to transitional care including hospital discharge of the elderly. These include pre- and post-discharge interventions, such as profession-oriented interventions (e.g., education and training); organizational interventions (e.g., transfer nurse, discharge protocol, discharge planning, medication reconciliation, standardized discharge letter, and electronic tools); and interventions around the patient and their next of kin (e.g., patient awareness, empowerment and discharge support). Despite the variety of interventions reported in the

literature, the review did not find evidence for the validity of any one over another. Combining pre-and post-discharge interventions, however, appears to provide better results than interventions provided only in one setting.

c) *What methodological approaches are suitable for providing an increased understanding of transitional care of the elderly?*

Most studies on transitional care have used methods such as individual interviews or focus groups, concentrating on the experiences of professional groups or stakeholders in isolation. There is little detailed understanding of the hospital discharge process or knowledge about significant contextual factors. Ethnographic research and observational studies are under-represented in the literature on care transitions specifically and healthcare in general. The results of this thesis indicate that observational research approaches are powerful ways to describe and understand transitional care within their given context.

d) *What characterizes hospital discharge of the elderly to follow-up care in municipal services, and why does discharge performance vary?*

By applying the Functional Resonance Analysis Method, this thesis identified a set of common functions that typically occur on the day of discharge, demonstrating that hospital discharge is a complex multi-agency care process. It covers multiple activities and goals. Through the application of FRAM, the thesis identified a number of less well-recognized issues that might explain variation in discharge performance and outcomes. In particular, there is a strong degree of interrelatedness between the discharge functions, suggesting that performance variability may arise out of functional interdependencies.

e) *How does the hospital discharge system adapt to its contextual environment, and what are the implications of those adjustments?*

By studying the changes imposed by the Coordination Reform (2012), this thesis showed how clinical environments (hospital wards and units

in primary care) adjusted their operations to manage a new set of demands imposed by the reform. The adjustments involved: (1) discharge planning between hospitals and primary care services; (2) flexibility in primary care services to receive patients; and (3) time efficiency on the day of discharge. From a hospital's perspective, the outcomes of those adjustments were largely successful. From a primary care perspective, the picture is more subtle, and the outcomes are seen as variable, sometimes problematic. From a patient's perspective, the adjustments appear to contribute to increased vulnerability of the elderly, requiring multiple care transitions and care providers. The findings therefore stress the need to clarify definitions of acceptable successful outcomes.

As a whole, the thesis broadens our understanding of the processes and practices involved in transitional care and the complexity surrounding it. Interrelated functions shape and affect care transitions performance and outcomes. The thesis points to two critical implications for improving transitional care practices. First, the concepts of complex interactions and dependencies should be applied as analytical dimensions when studying transitional care. Second, given the importance of interconnections, the findings emphasize the need to extend the analysis beyond narrowly-defined clinical microsystems in and across care levels, and include patients and their next of kin to gain a multi-agency stakeholder perspective.

7 References

A

Aase, K., Laugaland, A.K., Dyrstad, N.D., Storm M. (2013). Quality and Safety in Transitional Care of the Elderly: the study protocol of a case study research design (phase 1). *BMJ Open,* Vol. 3.

Abraham, J., Kannampallil, G.T., Patel, L.V. (2012). Bridging gaps in handoffs: A continuity based approach. *Journal of Biomedical Informatics,* 45:240-254.

Alamberti, R. (2013). Resilience and Safety in Health Care: Marriage or Divorce? in Hollnagel, E., Braithwaite, J., Wears, R. (Eds). *Resilient Health Care*. Ashgate.

Alm, H., & Woltjer, R. (2009). Patient safety investigation through the lens of FRAM in De Waard, D., Axelsson, A., Berglund, M., Peters, B., and Weikert, C. (Eds). *Human Factors: A system view of human, technology and organization.* Shaker Publishing.

Alper, E., O'Malley, T.A., Greenwald, J. (2011). Hospital Discharge. UpToDate.com. Available at: http://www.uptodate.com/contents/hospital-discharge

Anthony,D., Chetty, VK., Kartha, A., et al. (2005). Re-engineering the Hospital Discharge; An Exampe of a Multifacated Process Evaluation. *Advances in Patient Safety: From Research to Implementation 2*, pp. 379 – 394.

Anderson, R., Crabtree, F.B., Steele, J. D., McDaniel, R.R. (2005). Case Study Research: The view from complexity science. *Qualitative Health Research,* 15 (5):669-685.

Anderson, J.E., Ross, A.J., Jaye, P. (2013a). Resilience engineering in healthcare: moving from epistemology to theory and practice. In Herrera, I., Schraagen, M.J., Van der Vorm, J., Woods, D. (Eds): *Proceedings 5th Resilience Engineering Symposium. Managing trade-offs;* 25-27 Jun 2013, at Soesterberg. Netherlands.

Anderson, E.J,, Kodate, N., Walters, R., Doods, A. (2013b). Can incident reporting improve safety? Healthcare practitioners views on the effectiveness of incident reporting. *International Journal for Quality in Healthcare*, 25(2):141-50.

Arman, R., Vie, E.O., Åsvoll, H. (2012) Refining shadowing methods for studying managerial work. In Tengblad, S (Ed.) *The Work of Managers: Towards a practice Theory of Management.* Oxford University Press.

B

Bate, P., & Robert, G. (2007). Experience-based design: from redesigning the system around the patient to co-designing services with the patient. *Quality & Safety in health Care*, 15:307-310.

Barach, P., & Johnson, J.K. (2006). Understanding the complexity of redesigning care around the clinical microsystem. *Quality & Safety in Health Care,*(suppl 1):10-16.

Baxter, G. (2010). White paper: Complexity in healthcare, The UK National Research and Training Initiative, LSCITS.

Belmonte, F., Schön, W., Heurley, L., Capel, R. (2011). Interdisciplinary safety analysis of complex socio-technological systems based on the Functional Resonance Accident Model: an application to railway traffic supervision. *Reliability Engineering & System Safety,* 96 (2): 237–249.

Bergmo, T.S., Ersdal, G., Rødseth, E., Berntsen, G.(2013). Electronic Message to Improve Information Exchange in Primary Care. Telemed: *The fifth International Conference on e Health, Telemedicine, and Social Medicine.*

Blaikie, N. (2010). *Designing Social Research*. 2nd Edition. Polity Press, Cambridge.

Boin, A., Comfort, K.L., Demchak, C.C. (2010*). The rise of resilience.* University of Pittsburgh Press. Available at:

http://www.upress.pitt.edu/htmlSourceFiles/pdfs/9780822960614exr.pdf

Bote, N. D., & Beile, P. (2005). Scholars before researchers: On the Centrality of the Dissertation Literature Review in Research Preparation. *Educational Researcher*, Vol. 34.no 6:3-15.

Borys, D., Else D., Leggett, S. (2009). The fifth age of safety: the adaptive age. *Journal of Health & Safety Research & Practice*. (1)1:19-27.

Branlat, M., & Woods, D.D. (2010). How do Systems Manage their Adaptive Capacity to Successfully Handle Disruptions? A Resilience Engineering Perspective. Complex Adaptive Systems —Resilience, Robustness, and Evolvability: Papers from the AAAI Fall Symposium (FS-10-03). Available at: http://www.aaai.org/ocs/index.php/FSS/FSS10/paper/view/2238/2638

Braithwaite, J., Clay-Williams, R., Nuges, P., Plumb, J. (2013). Health Care as a Complex Adaptive System in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). *Resilient Health Care.* Ashgate.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in Psychology,* 3 (2):77-101.

Brunborg, H. (2012). Increasing life expectancy and the growing elderly population. *Norsk Epidemiologi*, 22 (2):75-83.

Bryan, K. (2010). Policies for reducing delayed discharge from hospital. *British medical Bulletin,* 95:33-46.

C

Carter, A.C., Ruhe, C.M., Weyer, S., et al. (2007). An Appreciative Inquiry Approach to Practice Improvement and Transformative Change in Health Care Settings. *Quality Management in Health Care*, vol 16, no 3 pp.194-204.

Capara, A., & Landim, L. P. (2008). *Ethnography: use, potentialities and limits in health research.* Translated by Philip Sidney Pacheco Badiz. Interface (Botucatu) [online], vol.4. Selected edition. Available

at: http://socialsciences.scielo.org/scielo.php?pid=S1414-32832008000100010&script=sci_arttext

Chassin, R.M., & Loeb, M. J. (2013). High Reliability Health Care: Getting there from here. *The Milbank Quarterly,* Vol. 91, No3: 459-490.

Clarke, D.,Werestiuk,K., Schoffner A et al. (2012). Achieving the "perfect handoff" in patient transfers:building teamwork and trust. *Journal of Nursing Mangement*, 20:592-589.

Clay- Williams, R. (2013). Re-structuring and the Resilient Organisation: Implications for Healt Care in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). *Resilient Health Care*. Ashgate.

Cook, R., & Rasmussen, J. (2005). "Going solid": a model of system dynamics and consequences for patient safety. *Quality and Safety in Health Care,*14:130-134.

Coleman, E.A., & Boult, C. (2003). Improving the Quality of Transitional Care for Persons with Complex Care Needs. *Journal of the American Geriatric Society*, Vol. 51 (4):556-7.

Coleman, E.A. (2003). Falling through the cracks": Challenges and opportunities for improving transitional care for persons with continuous complex care needs. *Journal of American Geriatric Society* 51(4): 549-55.

Coleman, E.A., & Fox, P.D. (2004). One Patient, Many Places: Managing Patient Transitions of Care. *Annals of Long-Term Care,* Vol.12 (9): 1225- 32.

Coleman, E.A., Mind, S., Chomiak, A., Kramer, M.A. (2004). Posthospital Care Transitions: Patterns, Complications, and Risk Identification. *Health Services Research,* 39(5):1449-66.

Coleman, E.A. (2006). Transitional care performance measurement in National Research Council. Performance Measurement: Accelerating Improvement (Pathways to Quality Health Care Series). Washington, DC: The National Academies Press.

Corbett, C.F., Setter, S.M., Daratha, K.B., Neumiller, J.J. et al. (2010). Nurse identified hospital to home medication discrepancies: implications for improving transitional care. *Geriatric Nursing,* vol. 31 (3).

Coulter, A., Fitzpatric, R., Cornwell, J. (2009). *The Point of care, Measures of patients' experiences in hospital: purpose, methods and use*. London: The Kings Fund.

Cresswell, M.K., Panesar, S.S., Salvilla, A.S., et al. (2013). Global Research priorities to Better understand the Burden of Iatrogenic Harm in Primary Care: An International Delphi Exercise. *PLOS Medicine*, Vol. 10 (11).

D

Davis, M. M., Devoe, M., Kansagara, D. et al. (2012).”Did I do as best as the system would let me?” Healthcare professionals view on hospital to home care transitions. *Journal of General Internal Medicine,* 27 (12):1649-56.

Davis, R.E., Sevdalis. N., Neale, G. et al. (2013). Hospital patients' reports of medical errors and undesirable events in their health care. *Journal of evaluation in Clinical Practice*, 19:875-81.

De Carvalho, P.V.R. (2011). The use of functional resonance analysis method (FRAM) in mid-air collision to understand some characteristics of the air traffic management system resilience. *Reliability Engineering and System Safety.* 96(11):1482-1498.

Dekker, S. (2006). Resilience Engineering: Chronicling the emergence of confused consensus in Hollnagel, E., Woods, D., Leveson, N. (eds). *Resilience Engineering concepts and Precepts.* Ashgate.

Dekker, S. (2011). *Drift into failure. From Hunting broken components to understanding complex systems.* Ashgate.

Dewalt, K.M., & DeWalt, B.R. (2011). *Participant observation: a guide for fieldworkers.* AltaMira Press.

Dhalla, A.I., O' Brian, T., Ko, F.,Laupacis, A. (2012). Towards safer transitions: How can we reduce post-discharge adverse events? *Healthcare quarterly*. Vol.15. Special issue.

Dixon-Woods, M. (2010). Why is patient safety so hard? A selective review of ethnographic studies. *Journal of Health Services Research Policy.* Vol 15 (1):11-16.

Dollarhide, W.A., Rutledge, T., Weinger, B.M., Fisher, S.E. et al. (2013). A Real- Time Assessment of Factors influencing Medication Events. *Journal of Healthcare Quality*, Vol. 0, (0):1-8.

Doyle, C., Lennox, L., Bell, D. (2013). A systematic review of the evidence of links between patient experience and clinical safety and effectiveness. *BMJ Open,* Vol. 3.

E

Edgren, L., & Bernard, K (2012). Complex adaptive systems for management of integrated care. *Leadership in Health Services*, Vol 25 Iss 1 pp.39-51.

Eisenhardt, K. (1989). Building theories from case study research. Academy of management. *The Academy of Management Review,*14 (4):532-50.

Eisenhardt, K., & Graebner, E.M. (2007). Theory building from cases: opportunities and challenges. *Academy of Management Journal.* Vol. 50 (1): 25-32.

Ekstedt, M., & Cook, R.I. (2015). Blizzard: A resilience expression in community based care. In Wears R, Hollnagel E, Braithwaite J. (eds) *Resilience in everyday clinical work.* Ashgate.

Enderlin A.C., McLeskey, N., Rooker,L.J., et al. (2013). Review of current conceptual models and frameworks to guide transitions of care in older adults*. Geriatric Nursing,* 34:47-52.

F

Flemming, K. (2009). Synthesis of quantitative and qualitative research: an example using Critical Interpretive Synthesis. *Journal of Advanced Nursing*, 66 (1): 201-217.

Flin R., Winter, J., Sarac, C., Raduma, M. (2009). Human factors in patient safety: review of topics and tools. *Report for methods and measures working group of WHO patient safety.* Geneva (SW): World Health Organization.

Flink, M., Hesselink, G., Pijnenborg, L., et al. (2012). The key actor: a qualitative study of patient participation in the handover process in Europe. *BMJ Quality & Safety,* 21:89-96.

Foss, C., & Askautrud, M. (2010). Measuring the participation of elderly patients in the discharge process from hospital: a critical review of existing instruments. *Scandinavian Journal of Caring Science*, 24.Suppl. 1:46-55

Forster, A.J., Murff, H.J., Peterson, J.F. et al. (2003). The incidence and severity of adverse events affecting patients after discharge from the hospital. *Annals of Internal Medicine.* 138:161-167.

Francis, R. (2013) *Report of the Mid Staffordshire* NHS Foundation Trust Public Inquiry. London: The Stationery office.

Frost, B., & Mo, P.T.J (2014). System Hazard Analysis of a complex Socio-Technical System: The Functional Resonance Analysis Method in Hazard Identification.

Fujita, Y. (2006). Nature of changes in systems in Hollnagel, E.,Woods, D.D., Leveson N: *Resilience Engineering concepts and Precepts*. Ashgate.

G

Garaasen, H., & Johnsen, R. (2007). The quality of communication about the elderly between hospital physicians and general practitioners: a panel study assessment. *BMC Health Service Research,*7:133.

Geary, R.C., & Schumacher, L.K. (2012). Care Transitions. Integrating Transition Theory and Complexity Science Concepts. *Advances in Nursing Science,* Vol. 35, (3):236-248.

Glaziou, P., Irwin L., Bain C., Colditz G. (2001). *Systematic reviews in healthcare: A practical guide*. Cambridge University Press.

Göbel, B., Zwart, D., Hesselink, G. et al. (2012). Stakeholder perspectives on handovers between hospital staff and general practitioners: an evaluation through the microsystems lens. *BMJ Quality & Safety*, 21:106-113.

Graneheim, U.H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today,* 24:105-112.

Greenwald, J., Denham, C., Jack, B. (2007). The hospital discharge: A review of a high risk care transition with highlights of a reengineered discharge process. *Journal of Patient Safety* ,3:97-106.

Grimsmo, A. (2013). Hvordan har kommunene løst utfordringen med utskrivningsklare pasienter? (In Norwegian). *Sykepleien Forskning,* 8(2):148-155

H

Hammersley, M., & Atkinson, P. (2007). *Ethnography: Principles in practice.* Third Edition. Routledge.

Heimly, V., & Hygen, J. (2011). The Norwegian Coordination Reform and the Role of Electronic collaboration. *Electronic Journal of Health Informatics*, Vol. 6(4).

Helms, A.S., Perez,E.T.,Baltz, J., Donowitz,G. et al. (2011). Use of an Appreciative Inquiry Approach to Improve Resident Sign-Out in an Era of Multiple Shift Changes. *Journal of General Internal Medicine* 27(3):287-91.

Hellesø, R., Lorensen, M., Sorensen, L. (2004). Challenging the information gap-the patients transfer from hospital to home health care. *International Journal of Medical Informatics.* 73:569-580.

Helsedirektoratet (2014): Samhandlingsstatistikk 2012-13 (in Norwegian) Available at: http://www.helsedirektoratet.no/publikasjoner/samhandlingsstatistikk-2012-13/Publikasjoner/samhandlingsstatistikk-2012-2013.pdf

Hesselink, G., Link, M., Olsson, M., et al. (2012). Are patients discharged with care? A qualitative study of perceptions and experiences of patients, family members and care providers. *BMJ Quality & Safety,* 21 Suppl 1:39-49.

Higginbottom, A.M.G., Pillay, J.J., Boadu, Y.N. (2013). Guidance on Performing focused Ethnographies with an emphasis on Healthcare Research. *The qualitative report*, vol.18, 17:1-16.

Hilligoss, B., & Cohen, M. (2013). The Unappreciated Challenges of Between- Unit Handoffs: Negotiating and Coordinating Across Boundaries. *Annals of Emergency Medicine*, vol. 61. No2.

Holen-Rabbersvik, E., Eikebrokk, R.T., Fensli, W.R., et al. (2013). Important challenges for coordination and inter-municipal cooperation in health care services: a Delphi study. *BMC Health Services Research,* 13:451.

Hollnagel, E., & Nygren, M. (2006). *Proposal of performance indicators/model of operational readiness verification (ORV) at restart after a planned shutdown.* (SKI Report 2006:xx). Stockholm, Sweden: Swedish Nuclear Power Inspectorate.

Hollnagel, E., & Woods D.D. (2006). Epilogue: Resilience engineering precepts in Hollnagel, E., Woods, D., Leveson, N. (2006). *Resilience Engineering concepts and Precepts.* Ashgate.

Hollnagel, E., Pruchnicki, S., Woltjer, R., Etcher, S. (2008). Analysis of Comair flight 5191 with the functional resonance accident model. Published *in "8th International Symposium of the Australian Aviation Psychology Association*, Sydney: Australia.

Hollnagel, E. (2009a). The four cornerstones of resilience engineering in Nemeth, C.P., Hollnagel, E., Dekker, S. (Eds). *Resilience Engineering Perspectives, volume 2. Preparation and Restoration.* Ashgate.

Hollnagel, E. (2009b). *The ETTO principle: Efficiency- Thoroughness Trade-Off. Why things that go right sometimes go wrong*. Ashgate Publishing Limited.

Hollnagel, E., Tveiten, K.C., Albrechtsen, E.(2010). Resilient Engineering and Integrated Operations in the Petroleum Industry. Sintef report no:SINTEF A16331. Tapir Uttrykk, Trondheim.

Hollnagel, E. (2011). To learn or Not to learn, that is the question. In Hollnagel, E., Woods, D.D., Wreathall, J. *Resilience engineering in practice.* A guidebook. Ashgate.

Hollnagel, E. (2012a). *FRAM: the functional resonance analysis method. Modeling complex socio- technical systems*. Ashgate Publishing Limited. England.

Hollnagel, E. (2012b). Proactive approaches to safety management (Thought paper).The Health Foundation Inspring Improvement.

Hollnagel, E., Braithwaite. J., Wears, R. (2013). *Resilient Health Care.* Ashgate.

Hollnagel, E. (2013a). An Application of the Functional Resonance Analysis Method (FRAM) to Risk Assessment of Organisational Change. Swedish Radiation Safety Authority, Report number 2013:09.

Hollnagel, E. (2013b). Making Health Care Resilient: From safety-I to Safety-II in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). *Resilient Health Care*. Ashgate

Hollnagel, E (2014). *Safety-I and Safety II. The past and the future of safety management.* Ashgate.

Hollnagel, E (2015). Looking for patterns in Everyday clinical work. In Wears, R.,Hollnagel, E., Braithwaite J (Eds). *Resilient Health Care. Vol 2. The resilience of Everyday Clinical Work*. Ashgate.

Hopkins, A. (2007). *The problem of defining high reliability organizations*. Working paper 51. National research center of OHS regulation. Australian National University.

Hopkins, A. (2014). Issues in safety science. *Safety Science*, 67, 6-14.

Hudson, R,. Comer, L., Whichello, R (2014). Transitions in a wicked environment. *Journal of Nursing Management*. 22:201-210.

I

Iacono, J., Brown, A., Holtham, C. (2009). Research Methods – a Case Example of Participant Observation. *The Electronic Journal of Business Research Methods,* Vol.7 Issue 1: pp.39 – 46.

J

Jeffcott, S.A., Ibrahim, J.E., Cameron, P.A, (2009a). Resilience in healthcare and clinical handover. *BMJ Quality & Safety.* 18: 256-260.

Jeffcott, S. A., Evans, S.M., Cameron, P.A., Chin, G.S.M., Ibrahim, J.E. (2009b). Improving measurement in clinical handover. *BMJ Quality & Safety*, 18:272-277.

Jeffs, L., Tregunno, D., MacMillian, K., Espin, S. (2009). Building Clinical and Organizational Resilience to Reconcile Safety Threats, Tension and Trade-offs: Insight from Theory and Evidence. *Healthcare Quarterly,* Vol. 12. Special issue.

Jeffs, L., Lyons, F.R., Merkley, J., Bell, M.C. (2013). Clinicians' view on improving inter-organizational care transitions. *BMC Health Services Research,* 13:289.

Johnson, K.J., Farnan, M.J., Barach, P., et al. (2012). Searching for the missing pieces between the hospital and primary care: mapping the patient process during care transitions. *BMJ Quality and Safety*. **21**(Suppl 1)**:** 97-105.

Jordan, M.,Lanham, J.L., Anderson, A.R., McDanie, R.R. (2010). Implications of complex adaptive systems theory for interpreting

research about health care organizations. *Journal of Evaluation in Clinical Practice.* 16:228-231.

K

Kanaan, A.O., Donovan, J.L., Duchin, N.P, et al. (2013) Adverse Drug Events After Hospital Discharge in Older Adults: Types, Severity, and Involvement of Beers Criteria Medications. *Journal of the American Geriatrics Society.* doi:10.1111/jgs.12504.

Knechel, A.N. (2013). The Challenges of Enrolling Older Adults into Intervention Studies. *Yale Journal of Biology and medicine*, 86, pp.41-47.

Kitzinger, J. (2006) Focus Groups, in *Qualitative Research in Health Care*, Third Edition (eds C. Pope and N. Mays), Blackwell Publishing Ltd, Oxford, UK.

Kripalani, S., LeFevre, F., Phillips, C.O. (2007). Deficits in Communication and Information Transfer between Hospital- Based and primary care physicians. *Journal of the American Medical Association.* Vol. 297 (8).

Krumholz, M.H. (2013). Post- hospital Syndrome – An Acquired, Transient Condition of Generalized Risk. *The New England Journal of Medicine,* 368:2.

L

LaMantia, M.A., Scheunemann, L.P., Viera, A. et al. (2010). Interventions to improve transitional care between nursing homes and hospitals: A Systematic Review. *Journal of the American Geriatrics Society*, 58:777-782.

Lancet (2014). Global elderly care in crisis. *Lancet,* Vol.383, Issue 9921, Page 927.

Laugaland, K., Aase, K., Barach, P. (2011). Addressing risk factors for transitional care of the elderly – Literature review. In Albolini, S., Bagnare, S., Bellani, T., Llaneza, J., Rosal, G. & Tartaglia, R. (Eds.). *Healthcare Systems Ergonomics and Patient safety 2011 – An alliance*

between Professionals and Citizens for Patient Safety and Quality of Life. CRC Press, Taylor & Francis Group, London, UK. ISBN: 978-0-415-68413-2.

Laugaland, K., Aase, K. & Barach, P. (2012). Interventions to Improve Patient Safety in Transitional Care – A Review of the Evidence. *Work, A Journal of Prevention, Assessment and Rehabilitation,* Vol. 41, Supplement 1/2012, pp. 2915-2924.

Laugaland, K., Aase, K., Waring J. (2014). Hospital discharge of the elderly- an observational case study of functions, variability and performance shaping factors. *BMC Health Services Research,* 14:365.

Laugaland, K., & Aase, K. (2015). The demands imposed by a health care reform on clinical work in transitional care of the elderly: A multi-faceted Janus. In Wears R, Hollnagel E, Braithwaite J. (Eds) *Resilience in everyday clinical* work. Ashgate.

LeBlanc, R.V., Manser, T., Weinger, B.M., et al. (2011). The Study of Factors Affecting Human and Systems performance in Healthcare Using Simulation. *Simulation in Healthcare,* Vol. 6, No 7.

Leslie, M., Paradis, E., Gropper, A.M., et al. (2013). Applying ethnography to the study of context in healthcare quality and safety. *BMJ Quality & Safety,* 0:1-7.

Lincoln, Y.S., & Guba E.G. (1985). *Naturalistic inquiry.* Sage Publication.

Long, J.S., Brown, F.K., Ames, D., Vincent, C. (2013). What is known about adverse events in older medical hospital inpatients? A systematic review of the literature. *International Journal for Quality in Health Care.,* 25(5):542-54.

Longtin, Y., Sax, H., Leape, L., et al. (2010). Patient Participation: Current Knowledge and Applicability to Patient Safety. *Mayo Clinic Proceedings,* 85,1:53.

M

Mainz, J. (2003). Defining and classifying clinical indicators for quality improvement. *International Journal for Quality in Health Care*, Vol. 15 (6): 523–530.

Majeed, M.U., Williams, D.T., Pollock, R., et al. (2012). Delay in discharge and its impact on unnecessary hospital bed occupancy. *BMC Health Services Research*, 12(1):410.

Malterud, K. (2012). Systematic text condensation: A strategy for qualitative analysis. *Scandinavian Journal of Public Health*, 40:795-805.

Mandi, M.A., & Jackson, S. (2009). Towards a conceptual Framework for resilience engineering. *IEEE Systems Journal,* vol. 3(2).

Manzano Santaella, A. (2011). A realistic evaluation of fines for hospital discharges. Incorporating the history of programme evaluations in the analysis. *Evaluation;* 17: 21-36.

Manser, T. (2009). Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. *Acta Anaesthesiol Scandinavica,* 53:143-151.

Manser, T., & Foster, S. (2011). Effective handover communication: An overview of research and improvement efforts. *Best practice & Research Clinical Anaesthesiology*, 25:181-191.

Manser, T. (2013). Fragmentation of patient safety research: a critical reflection of current human factors approaches to patient handover. *Journal of Public Health Research*, vol 2.

Martin-Breen, P., & Anderies, J.M. (2011). *Resilience: A Literature Review*, The Rockefeller Foundation.

Matlow, G.A., Wright G.J., Zimmerman, B., et al. (2006). How can the principles of complexity science be applied to improve the coordination of care for complex pediatric patients? *Quality & Safety in Health Care,* 15:85-88.

McCuster, J., Cole, M., Abrahamowicz, M., et. al. (2001). Environmental risk factors for delirium in hospitalized the elderly. *Journal of the American Geriatrics Society* ,49:1327-34.

McDaniel, RR., Driebe, D.J., Lanham, H.J. (2013). Health care organizations as complex systems: new perspectives on design and management. *Advances in Health Care Management*, 15:3-26.

McMurdo, M.E.T., Roberts H., Parker S., et al. (2011). Improving recruitment of the elderlyto research through good practice. *Age and Aging*, 40:659-665.

McMurdo M.E.T., Witham, M.D. (2013). Unnecessary ward moves. *Age and Ageing*, 42:555-556

Mesteig, M., Helbostad, L.J., Sletvold, O., et al.(2010). Unwanted incidents during transition of geriatric patients from hospital to home: a prospective observational study. *BMC Health Services Research*, 10:1.

Miles, M.B., & Huberman, M.A, (1994), *Qualitative data analysis.* Second edition. Sage Publication.

Mintzberg, H. (1971). Managerial Work: Analysis from Observation. *Management Science*, vol. 18, No. 2, Application Series. (Oct., 1971), pp. B97-B110.

Moray. N. (2000). Culture, politics and ergonomics. *Ergonomics,* 43, 868-868.

Morse, J.M., & Richards, L. (2002). *Read me first for a user's guide to qualitative method*s. Sage Publication.

Moore, C., Wisnivesky, J., Williams, S., et al. (2003). Medical errors related to discontinuity of care from an inpatient to an outpatient setting. *Journal of General Internal Medicine,* vol. 18: 646-651.

Mountford, J., & Shojania, K.G. (2012). Refocusing quality measurement to best support quality improvement: local ownership of quality measurement by clinicians. *BMJ Quality & Safety,* 21:519–23.

N

Naylor, M., & Keating, S.A. (2008). Transitional care. *The American Journal of Nursing,* 108(9):(suppl) 58-63.

Nemeth, C.P., & Cook, R.I. (2007). Reliability versus resilience: what does healthcare really need? In: Dominguez C (chair), ed. Symposium on High Reliability in Healthcare. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting,* Baltimore. 621–5.

Nemeth, C. (2013): Erik Hollnagel: FRAM: The functional resonance analysis method, modeling complex socio-technical systems. *Cognition Technology & Work,* 15:117-118.

Nicholson, P.J. (2007). How to undertake a systematic review in an occupational setting. *Occupational and Environmental Medicine*, 64 (5):353-358.

O

Ocloo, J., Shea, O.A., Fulop, N. (2013). Empowerment or rhetoric? Investigating the role of NHS Foundation Trust governors in the governance of patient safety. *Health Policy*, 111:301-310.
Otterstad, K. (2011). Hva kan vi lære av svensk samhandling (in Norwegian) *Sykepleien*, 99(14):60-62.

Olsen, M.R., Hellzen, O., Skotnes, L.H. et al. (2014). Breakdown in informational continuity of care during hospitalization of older home-living patients: A case study. *International Journal of Integrated Care*: Apr–Jun; URN:NBN:NL:UI:10-1-114779.

P

Rasmussen, J. (1997). Risk management in a dynamic society: A modelling problem. *Safety Science*, Vol.27 no 2-3:183-213.

Patient Rights Act 1999. Available at: http://lovdata.no/all/nl-19990702-063.html (In Norwegian).

Patterson, E.S., Cook, R.I., Woods, D.D., Render, M.L. (2004). Gaps and resilience. In Bogner, M.S. (Ed.) *Human Error in Medicine* 2nd Edition. Lawrence Erlbaum Associates, Hillsdale, NJ.

Patton, Q.M. (1999). Enhancing the Quality and Credibility of Qualitative Analysis. *Health Services Research*, 34:5.

Patton, Q. M. (2002). *Qualitative research & Evaluation Methods*. Third Edition Sage Publications.

Pope, C., & Mays, N. (2006). *Qualitative research in health care.* Third edition. Blackwell Publishing.

R

Ragin, C.C., & Becker, S.H. (2009). *What is a Case? Exploring the Foundations of Social Inquiry.* Cambridge University Press.

Rankin, A., Lundberg, J., Woltjer, W., et al. (2013). Resilience in Everyday Operations: A Framework for Analyzing Adaptions in High-Risk Work. *Journal of Cognitive Engineering and Decision Making,* Vol. XX,(X):1-20.

Raisio, H. (2009).Health care reforms planners and wicked problems. *Journal of Health Organization and Management,* vol. 23 (5): 477-493.

Rennke, S., Nguyen, O., Shoeb, H, M., et al. (2013). Hospital- initiated Transitional Care interventions as a Patient safety Strategy. *Annals of Internal Medicine,* vol.158 (5):433-441.

Reiman, T., & Pietikainen, E. (2012). Leading indicators of system safety – Monitoring and driving the organizational safety potential. *Safety Science*.50:1993-2000.

Report to Parliament no.47 (2008-2009). Coordination reform: Proper treatment – at the right place and right time. Available at: http://www.regjeringen.no/upload/HOD/Dokumenter%20INFO/Samhandling%20engelsk_PDFS.pd

Ringard, Å., Sagan, A., Sperre Saunes, I., Lindahl A.K. (2013). Norway: Health system review. *Health Systems in Transition*, 15(8):1–162.

Ritchey, T. (2005) "Wicked Problems: Structuring Social Messes with Morphological Analysis". Available at: http://www.swemorph.com/pdf/it-webart.pdf

Ring, N., Ritchie K., Mandava, L., Jepson, R.A (2011). A guide to synthesising qualitative research for researchers undertaking health technology assessments and systemic reviews. NHS Quality Improvement Scotland. Available from: http://www.nhshealthquality.org/nhsqis/8837.html

Robinson, C.A., Bottorff, J.L., Lilly, M.B et al. (2012). Stakeholders perspectives on transitions of nursing home residents to hospital emergency departments and back in two Canadian provinces. *Journal of Aging Studies*, 26 (4): 419-427.

Robson, R. (2013). Resilient Health Care in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). *Resilient Health Care*. Ashgate

Romøren, I.T., Torjesen, O.D., Landmark, B. (2011). Promoting coordination in Norwegian health care. *International Journal of Integrated Care.* Vol.11:e127.

Ross, A., & Anderson, J. (2015). Mobilizing resilience by monitoring the right things for the right people at the right time. In Wears R, Hollnagel E, Braithwaite J. *Resilience in everyday clinical work*. Ashgate.

Rossness, R., Grøtan, T.O., Guttormsen, G., et al. (2010). *Organisational accidents and Resilient Organisations: Six perspectives*, Revision 2. SINTEF.

Runciman, B., Merry, A., Walton, M. (2007). *Safety and ethics in healthcare: A guide to getting it right*. Aldershot, UK: Ashgate.

Rutherford, P., Nielsen, G.A., Taylor, J., et al. (2011). *How-to Guide: Improving Transitions from the Hospital to Post-Acute Care Settings to*

Reduce Avoidable Rehospitalisation. Cambridge, MA: Institute for Healthcare Improvement; June 2011. Available at www.IHI.org

S

Scala, E., & Costa, L.L (2013). Using appreciative Inquiry During Care Transitions. An Exploratory Study. *Journal of Nursing Care Quality*, vol 29, no 1. pp.44-50.

Schwappach, D. (2008). "Against the silence": Development and first results of a patient survey to assess experiences of safety-related events in hospital. *BMC Health Services Research*, 8:59.

Schwappach, D.L. (2010) Review: engaging patients as vigilant partners in safety: a systematic review. *Medical Care Research and Review*, 67:119e48.

Shendell-Falik, N., Feinson, M., Mohr,B. (2007). Enhancing Patient Safety. Improving the Patient Handoff Process Through Appreciative Inquiry. *The Journal of Nursing Administration*, vol 37.no 2 pp. 95-104.

Shekelle, G.P., Pronovost, J.P., Wachter, M.R. (2011). Advancing the science of patient safety. *Annals of internal medicine,* 154:693-696.

Sheps, S., & Cardiff, K. (2013). Looking at Successes versus Looking at Failure: Is Quality Safety? Is Safety Quality? in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). *Resilient Health Care*. Ashgate

Shojanina, G.K. (2010). The Elephant of Patient Safety: What you see Depends on How you Look. *The Joint Commission Journal on Quality and Patient Safety*, vol. 36 (9):399-401.

Silverman, D. (2001). *Interpreting Qualitative Data*. Sage, London.

Snyder, N.,& Glueck, F.W (1980). How Managers Plan –The Analysis of Managers' Activities. *Long Range Planning,* vol 13.

St.mld 10 (2012-2013). *God kvalitet- trygge tjenester. Kvalitet og pasientsikkerhet I helse- og omsorgstjenesten* (in Norwegian). Oslo, Helse og – omsorgsdepartementet.

Steenhuis, H.J., & Bruijn, E.J. (2006). *Building theories from case study research: the progressive case study.* In: unspecified.

Stephens, R.J., Woods, D.D., Branlat, M., Wears, R.L. (2011). Colliding dilemmas: interactions of locally adaptive strategies in a hospital setting. Proceedings of the 4th International Conference on Resilience Engineering (pp.256-262), Sophia Antipolis, France, 6-8 June 2011.

Stevens, P.D., & Shojania, G.K. (2011). Tell me about the context, and more. *BMJ Quality & Safety,* vol. 20 (7).

Storm, M., Siemsen, D.M.I, Laugaland, K., Dyrstad N.D., Aase, K (2014). Quality in transitional care of the elderly: Key challenges and relevant improvement efforts. *International Journal of integrated care*, vol. 14.

Stoop, J. (2011).No fact, No Glory. In Hollnagel, E., Woods, D.D., Wreathall, J. *Resilience Engineering in practice. A guidebook.* Ashgate.

Sujan, A.M., & Felici, M. (2012). Combining Failure Mode and Functional Resonance Analysis in Healthcare Settings. *Computer Safety, Reliability, and Security Lecture Notes in Computer Science*, vol. 7612 pp. 364-375.

Sujan, M., Matthew, I.K., Michelle, R., et al. (2014). Clinical handover within the emergency care pathway and the potential risks of clinical handover failure (ECHO): primary research. Health Services and Delivery Research, 2 (5):1-11.

Swanson, J. (2013). *Bed Blocking and the City.* Master Thesis. Department of Health and Management and Health economics, University of Oslo.

T

Taylor, L.S., Dy, S., Foy, R., et. al. (2011). What context features might be important determinants of the effectiveness of patient safety practices interventions? *BMJ Quality & Safety,* 20:611-617.

Toscan, J.,Manderson, B., Santi, M.S., Stolee, P. (2013). "Just another fish in the pond":the transitional care experience of a hip fracture patient. International *Journal of Integrated Care,* vol. 13,26.

Trebble, M.T., Hansi, N., Hydes, T., et al. (2010). Process mapping the patient journey: an introduction. *BMJ:*341:c4078.

Trueland, J. (2013). A moving experience. *Nursing Standard,* vol. 27 (52).

Tsasis, P., Evans, M.J., Owen, S. (2012). Reframing the challenges to integrated care: a complex adaptive systems perspective. *International Journal of Integrated Care*, vol. 12.

Tsilimingras, D., & Bates, D.W. (2008). Addressing Post-discharge Adverse events: A Neglected Area. *The Joint Commission Journal on Quality and Patient Safety,*vol.34(2).

Tsilimingras, D., Brummel-Smith, K., Brooks, G.R. (2009). Post-discharge Adverse Events in the Elderly. *Journal of Patient Safety,* vol. 5(4).

V

Vaismoradi, M., Turunen, H., Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences,* 15:398-405.

Verhaegh, J.K., MacNeil-Vroomen, L. J., Eslami, S. et al. (2014). Transitional care interventions. Prevent hospital readmissions for adults with chronic illnesses. *Health Affairs*, 33 (9): 1531-1539.

Vincent, C. (2006). *Patient Safety*. Elsevier.

Vincent, C., Batalden, P., Davidoff, F. (2011). Multidisciplinary centres for safety and quality improvement: learning from climate change science. *BMJ Quality & Safety*. 20 (Suppl 1):73-78.

Vincent, C. (2010). *Patient Safety*. Wiley- Blackwell.

Vincent, C., Burnett, S., Carthey, J. (2014). Safety measurement and monitoring in healthcare: a framework to guide clinical teams and healthcare organizations in maintaining safety. *BMJ Quality & Safety,* 0:1-8.

Viskum, B. (2012). Der er et misforhold mellem kvalitetskrav for medicinafstemning og den kliniske virkelighed (In Danish) *Ugeskrift for læger. Videnskab*.

W

Walker, A. (2007). Why involve elderly people in research. *Age and Aging,* 36:481-483.

Walsh, A. S. (2009). Conducting research with the elderly: Ethical concerns for a vulnerable population. *Southern online Journal of Nursing Research,* vol. 9 (4), Special issue: Ethics.

Walter S.R., Li, L. Dunsmuir W.T.M et al. (2013).Managing competing demands through task-switching and multitasking: a multi-setting observational study of 200 clinicians over 1000 hours. *BMJ Quality & Safety,* 0:1-11.

Waterson, P. (2009). A critical review of the systems approach within patient safety research. *Ergonomics,* 52(10):1185-1195.

Waring, J. (2000). *Towards an integrated organizational framework of hospital performance.* Aston Business School research papers. Aston centre for Health services Organization Research. Aston Business School. Birmingham.

Waring J. (2009). Constructing and Re-constructing Narratives of patient safety. *Social Science & Medicine.* 69 (12):1722-31.

Waring, J. (2013). What safety-II Might Learn from the Socio-cultural Critique of Safety-I in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). *Resilient Health Care.* Ashgate.

Waring, J., Marshall F., Bishop, S. et al. (2014). An ethnographic study of knowledge sharing across the boundaries between care processes,

services, and organisations: the contribution to "safe" hospital discharge. *Health Service and Delivery Research,* No.2.29.

Weissman, J.S., Schneider, E.C., Weingart, N.S., et al. (2008). Comparing patient-reported hospital adverse events with medical record review: Do patients know something that hospitals do not? *Annals of Internal Medicine,* 149 (2): 100-108.

Whittermore, R., & Knafl, K. (2005). The integrative review: updated methodology. *Journal of advanced nursing,* 52 (5), 546-553.

WHO. The world Health Report (2000). *Health systems: Improving performance*. Geneva: World Health Organization.

WHO. World Health Organization (2007). Communication During Patient Hand-Overs. Patient Safety Solutions 2007; volum 1; solution 3; May 2007.

WHO. World Health Organization (2008). Integration of health care delivery: report of a study group. Geneva Switzerland: Integrated health services – what and why? Technical Report series, No. 861.

WHO. World Health Organization (2012).*Safer primary Care. A Global Challenge.*

Wiig, S., Storm, M., Aase, K., Gjestsen, M. T., et al. (2013). Investigating the use of patient involvement and patient experience in quality improvement in Norway: rhetoric or reality? *BMC Health Services Research,* 13, 206.

Woods, D.D., & Cook, R.I. (2001). From counting failures to anticipating risks: possible futures for patient safety in L.A. Zipperer, S. Cushman, National Patient Safety Foundation (U.S.) (Eds.), *Lessons in Patient Safety, National Patient Safety Foundation,* Chicago, IL.

Woods, D.D., Patterson, E.E.,Cook, R.I. (2006). Behind Human Error: Tamping Complexity to Improve Patient Safety. In P. Carayon (ed.), *Handbook of human factors in healthcare.* Erlbaum (pp 455-472).

Woods, D.D., & Wreathall, J. (2008). Stress-Strain plots as Basis for Assessing System Resilience. In Hollnagel, E.,Nemeth, C.P., Dekker,

S.W.A (Eds), Resilience Engineering perspectives. Aldershot, UK: Ashgate.

Y

Yin, K. (2014). *Case Study Research Design and methods.* Fifth edition. Applied Social Research methods series, SAGE Publication.

Z

Zimmermann, B., Lindberg, C., Plsek, P. (1998). *Insights from complexity science for health care leaders*. Edgeware.3

Part II

List of papers

Paper I
Laugaland, K., Aase, K. & Barach, P. (2011). Addressing risk factors for transitional care of the elderly—Literature review. In Albolini, S., Bagnare, S., Bellani, T., Llaneza, J., Rosal, G. & Tartaglia, R. (Eds.). *Healthcare Systems Ergonomics and Patient safety 2011—An alliance between Professionals and Citizens for Patient Safety and Quality of Life.* CRC Press, Taylor & Francis Group, London, UK. ISBN: 978-0-415-68413-2.

Paper II
Laugaland, K., Aase, K. & Barach, P. (2012). Interventions to Improve Patient Safety in Transitional Care—A Review of the Evidence. *Work, A Journal of Prevention, Assessment and Rehabilitation,* Vol. 41, Supplement 1/2012, pp. 2915-2924.

Paper III
Karina Aase, Kristin Alstveit Laugaland, Dagrunn Nåden Dyrstad & Marianne Storm (2013). Quality and Safety in Transitional Care of the Elderly: the study protocol of a case study research design (phase 1). *BMJ Open,* Vol. 3.

Paper IV
Kristin Laugaland, Karina Aase & Justin Waring. (2014) Hospital discharge of the elderly—an observational case study of functions, variability and performance shaping factors. *BMC Health Services Research,* 14:365.

Paper V
Kristin Laugaland & Karina Aase (2015). The demands imposed by a health care reform on clinical work in transitional care of the elderly: A multi-faceted Janus. In Wears R, Hollnagel E, Braithwaite J. *Resilience in everyday clinical work.* Ashgate.

Paper I

Healthcare Systems Ergonomics and Patient Safety 2011 – Albolino et al. (eds)

Addressing risk factors for transitional care of the elderly—literature review

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ABSTRACT: Transitional care has become one of the most pressing topics in the global efforts to improve the reliability and safety of patients due to the growing evidence indicating the strong correlation of patient handovers with medical errors and adverse events. The elderly population with typically complex health problems frequently requires care in multiple settings. Elders appear to be a group particularly at risk for medical errors in general and during transitions between settings. This population is especially vulnerable for experiencing communication related adverse outcomes and problems of care fragmentation. Existing research has primarily been concerned with adverse events and medical errors occurring within the hospital. Review of the literature reveals that relatively little data is available to estimate the extent and impact of adverse events occurring during the transitions interface between primary and secondary health and care services. Despite the lack of empirical research a common message in existing literature is that adverse events occur in transitional care of the elderly. The major contributing risk factors for adverse events are ineffective care processes and poor communication. The type and incidence of adverse events reported in the literature are related to drug events, procedure related events, diagnostic test follow-up errors, nosocomial infections and falls. The severity of these adverse events varies from laboratory errors only to permanent disability and death. Risk factors related to transitional care should be recognized as a high yield area of intervention and improvement. This is particularly evident given the increasing elderly population and their repeated hospitalizations, iatrogenic complications, and uncoordinated care due to poorly executed transitions.

1 INTRODUCTION

Transitional care is defined as a set of actions designed to ensure the coordination and continuity of health care as patients transfer between different locations and different levels of care within the same location (Coleman et al. 2003). The transfer of essential information *and* the responsibility of care of the patient from one health care provider to another is an integral and vital component of effective communication in health care. This critical transfer point is known as a handover or handoff. An effective handoff supports the transition of critical information and continuity of care and treatment. Ineffective patient handoffs on the other hand can contribute to gaps in patient care and breaches in the systems resilience to protect the patient from harm (Friesen et al. 2008; Cook et al. 2000). The main goal during patient transfer is optimal patient care and safety (Boutilier 2007).

Interest in transitions, (handover or handoff) has grown steadily over the past decade and has become one of the hottest topics in the global patient safety area as researchers, hospital

administrators, educators and policy makers have appreciated that patient transfers represent a dynamic risk factor. The World Health Organisation (WHO) has listed "communication during patient care handovers" as one of its top 5 patient safety initiatives (WHO 2007).

Elderly people (>65) appear to be a group particularly at risk for medical errors. A growing body of evidence further suggests that this population is particularly vulnerable to experiencing discontinuity in care with the potential of adverse outcomes due to poorly executed transitions (Coleman 2003; Coleman & Boult 2003; Naylor & Keating 2008; Tsilimingras et al. 2003). Older patients, many with reduced mental capacity, are those most dependent on a health care system that is able to communicate appropriately and to transfer information and duties properly (Gårasen & Johnsen 2007). Frail older patients, particularly those with cognitive impairment consistently suffer repeated hospitalizations, iatrogenic complications, and uncoordinated care (LaMantia et al. 2010).

An increase in the elderly population in many countries further implies that the interface between primary and secondary healthcare is particularly important in creating a safe and reliable health care delivery system (Alamberti et al. 2005).

2 AIM

This paper focuses upon care transitions at the interface between primary and secondary service providers within elderly health and care. It aims to identify and raise awareness towards factors that are critical to patient safety. We focus upon inter-organizational pathways, in particular from hospital to community and the reverse plus/and also inter-professional communication from hospital-based nurse to community nurse and from hospital-based physician to general practitioner.

3 METHODOLOGY

We conducted a systematic literature search by using the electronic databases PubMed, Medline, Cinahl and Academic Search Elite. We also manually/hand searched references in the retrieved articles, to identify additional articles (snowballing search). The data searches were limited to English language articles that appeared in peer-reviewed journals published from 2000 until January 2011.[1] Keywords in our searches were: care transitions, inter-hospital transfer and elderly, information transfer, transitional care and elderly, patient safety and handover, patient transfer and patient safety, transitional care outcome, discontinuities in transitional care, adverse events and medical error. The criteria for inclusion were articles studying patient transitions between nursing homes, home and hospital in either direction. Samples had to contain a majority of older people (>65). We included studies addressing adverse events and medical errors associated with the process of transitional care. We also searched the following journals' contents page electronically for relevant papers: Journal of clinical nursing, Social science and Medicine, Aging and society, Age and Aging, Social care in the community, International Journal of Integrated Care. A total of 49 articles matched the inclusion criteria and were included in our review. We excluded all literature relating to mental health problems.

4 RISK FACTORS IDENTIFIED WITHIN TRANSITIONAL CARE

Previous research has primarily been concerned with adverse events occurring within the hospital. As a result we find in review that relatively few data are available to estimate the extent of adverse events occurring in the post-hospital period (Tsilimingras & Bates 2008). "To Err is Human"

[1] A ten year span was used in the first phase of the literature search reported in this paper aiming to map the recent studies on risk factors within transitional care of the elderly.

may thus have underestimated the overall safety problem, due to the fact that injuries occurring after discharge and outside the hospital was not included in the evaluation (Institute of Medicine 2000). Many of the studies in our literature review used readmission rates to identify poor transitional care. However, there is evidence that this outcome has limited value as an indicator of quality of care in general (Benbassat & Taragin 2000). There is currently a lack of methods to measure safety of patient care across levels, organizations and professions (Thomas & Lambert 2008) and strategies to improve transitional care are insufficient (LaMantia et al. 2010).

Despite the lack of empirical evidence a few studies indicate that adverse events occur frequently within transitional care and that elders and patients with complex care needs are particularly at risk. Research indicates that up to 49% of the patients will experience at least one discharge-related medical error or adverse event during care transitions (Moore et al. 2003). Several of these events have been identified and reported as preventable or ameliorable, meaning that although they were unavoidable their severity could have been decreased by earlier corrective actions (Foster et al. 2003, 2004). Results also show that the rate of adverse events seems likely to increase as patients age (Foster et al. 2004). The types of adverse events reported are adverse drug events, procedure related events, diagnostic test follow-up errors, nosocomial infections and falls. Missed diagnosis and incorrect treatment were also reported, but to a lesser degree (Moore et al. 2003; Foster et al. 2003, 2004). The severity of the adverse events varied from laboratory abnormalities to permanent disability and death. Fifty percent of patients experiencing an adverse event required the use of extra health care services and some patients was readmitted to the hospital (Moore et al. 2003; Foster et al. 2003, 2004). System problems such as ineffective and poor communication were a contributing factor in a majority of the preventable and ameliorable adverse events occurring (Foster et al. 2003, 2004; Moore et al. 2003). A commonly described contributing factor causing adverse events is the exchange of patient information among health care providers. Individual abilities and characteristics, team behaviours, systemic factors, and the lack of organisational support for a safety culture are factors that have been reported as influencing effective communication in healthcare (Leonard et al. 2004).

4.1 *Deficits in communication*

The handoff process refers to either the verbal or written communication of patient information, designed to familiarize oncoming or covering health care providers with patients from whom they will be responsible (Wachter 2008). In our review we find that when communication breaks down patients are at risk due to the fact that vital information (diagnostic findings, complications, consultations, test results pending, follow-up care) may not be shared adequately between physicians and nurses in the transitions between primary and secondary health and care services, resulting in a disability for them to perform their role and responsibilities effectively and appropriately (Roy et al. 2005). Incomplete or inaccurate information about the hospitalization can contribute to faulty medical decision-making or failure to adequately monitor the condition of the patient during follow-up care. It may negatively affect continuity and contribute to adverse events (Kripalani et al. 2007). Despite such findings relatively little attention has been given to adverse events that are caused by inadequate communication between hospital based physicians and outpatient primary care providers (Moore et al. 2003).

We find that within profession but across organizational boundaries communication is described as difficult and in many cases the communication from hospital-based physicians to community-based general practitioners is rated as poor (Foster et al. 2003; Kripalani et al. 2007; Garåsen & Johnsen 2007) and from hospital-based nurses to community nurses (Payne et al. 2002; Hellesø & Fagermoen 2010). Poor communication and coordination are evident in several studies (Arora et al. 2008; Sharit et al. 2008).

4.2 *Admission and discharge summaries lack vital information*

Our review suggests that admission and discharge summaries play a critical role in care transitions (Kripalani et al. 2007). Hospital discharge summaries serve as the primary documents communicating a patients care plan to the post-hospital care team. Direct and phone

communication occurs infrequently, and the discharge summary is often the only form of communication that accompanies the patient to the next care setting (Kripalani et al. 2007). There have been reported problems with timely receipt of information. Discharge summaries are often delayed or never reach the primary care physician at all (Kripalani et al. 2007). According to Walraven and colleagues (2002) they found a trend towards greater risk for readmission among patients who were seen and treated in follow-up by a physician who had not received a discharge summary. There are several studies reporting that discharge summaries lack essential information such as diagnostic test results, treatment or hospital course, discharge medications, test results pending at discharge, patient or family counseling and follow-up plans (Wilson et al. 2001; Foster et al. 2002; Kripalani et al. 2007). Garåsen and Johnsen (2007) assert that both referral and discharge letters often lack vital medical information, and referral letters to such an extent that it might represent a health hazard for older patients. Conversely, primary care physicians may not provide sufficient information to hospitals at admission. Transfer of information from community to hospital is also crucial for the preparation of discharge planning and subsequent care packages (Werret et al. 2001).

We find that nursing research has also raised awareness towards inadequate information transfer. Several studies report that the information transfer is inadequate. A study of nursing documentation from 36 patient records in Norway revealed that in 15 of the 36 records no nursing discharge note was found. There was no written information exchanged about the patient between the hospital and the receiving service provider in the community. In the 21 remaining nursing discharge notes none of the discharge notes were filled out completely (Hellesø et al. 2004). Essential clinical information, such as medications, medication allergies, caregiver contact information, cognitive status, depression status and follow-up plans were often missing when elderly patients were transferred to the home care services. Significant discrepancies between medication regimens are often identified (Brown et al. 2006).

4.2.1 *Adverse drug events*

In our review we find that failures in transferring adequate medical information, adverse drug events and medication discrepancies both at the time of hospital admission and at discharge represents a significant source of adverse events, with the potential to cause harm (Cornish et al. 2005; Schnipper et al. 2006; Vira et al. 2006; Perrren et al. 2009; Boockvar et al. 2004; Corbett et al. 2010; Gleason et al. 2010; Moore et al. 2003; Coleman et al. 2005; Rothschild et al. 2000; Wong et al. 2008; Unroe et al. 2010). Generally medication errors are the most described common type of adverse events within healthcare (Dean et al. 2002; Tsilimingras & Bates 2008; Foster et al. 2003).

One study reported that medication discrepancies were more common at discharge than during admission (Pippens et al. 2008). Most changes in drug use were discontinuations, followed by dose change and class substitutions (Boockvar et al. 2004). After screening 523 admissions another study found that eighty-one patients had at least one unintended discrepancy. The most common discrepancy was omission of a regularly used medication. Further, the study identified that approximately 40% of the discrepancies had the potential to cause moderate to severe discomfort or clinical deterioration (Cornish et al. 2005).

Elderly patients seem particularly vulnerable to medication discrepancies due to chronic co-morbid medical conditions, functional impairment, complex medical regimens often with prescriptions from several providers and extensive changes in their medication during hospitalization (Corbett et al. 2010). Older age and polypharmacy are known risk factors for medication discrepancies and errors (Coleman et al. 2005; Gleason et al. 2010). A study conducted within Norwegian municipalities revealed serious discrepancies between general practitioners and community nurses related to the medication lists for their common patients due to flaws in their information exchange and the lack of a common integrated ICT system. There was a lack of accordance in 60% of the medication lists that were compared between nurses in home care services and the general practitioners (Rognstad & Strand 2004).

The most common medication classes involved in errors include: cardiovascular agents (represents the majority), antidepressant, gastrointestinal agents, neurological agents, anti-diabetics,

and diuretics (Gleason et al. 2010; Moore et al. 2003; Coleman et al. 2005). However, the issue of medication problems experienced by elderly transitioning across health care settings has received relatively little attention in the medical literature (Coleman et al. 2005).

4.2.2 *Procedure and test follow-up errors*

Another potential risk that a few studies have identified as a risk factor after hospital discharge is related to failure to follow-up on procedures suggested or scheduled and test results (eg. laboratory test and radiological studies) pending at the time of discharge, which is the norm (Roy et al. 2005; Gandhi 2005; Moore et al. 2003). Moore and colleagues (2003) found that patients with a work-up error, described as a test or procedure suggest or scheduled by the inpatient provider but not adequately follow up by the outpatient provider was more likely to be rehospitalized within 3 months after the first outpatient visit. Roy and colleagues (2005) found that nearly half of all discharged patients have test results pending on the day of discharge of which approximately one half of these were abnormal. This study further demonstrated that primary care physicians often are unaware of potentially actionable test results returning after discharge. It is emphasized that few studies have addressed follow-up on test results pending at hospital discharge and suggesting that such test results are frequently overlooked in the handoff from the inpatient physician to the outpatient physician. This in turn can lead to adverse events in which these test result may have important clinical consequences for the patient that in some cases require urgent action (Roy et al. 2005).

4.3 *Summing up*

Effective communication of information is a vital component of the provision of safe transitional care. The result of the literature review indicates that in relation to information transfer across organizational boundaries, most research is concentrated on the hospital to home discharge for elderly patients rather than the reverse phase. This view is supported by the findings of Payne and colleagues who also found that most studies were descriptive and originating from nursing journals (2002). Patients discharged from hospital appear especially vulnerable to adverse events because of possible worsening of their functional impairments since admission, changes in the treatment regimen, discontinuities during their transition, and a limited support system (Tsilimingras & Bates 2008). Medical errors related to the discontinuity of care may be associated with an increased risk of rehospitalization (Moore et al. 2003). The potential for medical errors increases as patients undergo several care transitions (Coleman 2003). This tendency is described to be attributed to the clinical complexity of elderly care rather than age based discrimination (Thomas & Brennan 2000).

5 DISCUSSION

The transfer of patient information between settings and health care providers has been recognized as a risk factor in transitional care (Roy et al. 2005). Current studies on interactions among health care levels show evidence for a lack of communication between primary and secondary care (Dunnion & Kelly 2008). The majority of the types of communication from primary care to hospital form a one way communication rather than real teamwork (Werrett et al. 2001), the communication from hospital to primary care and conversely is also insufficient (Meara et al. 1992). It is stated that errors stemming from transitional care represent one of the most common and consequential errors in healthcare (Watcher 2008). However, to our knowledge there exist limited evidence-based empirical research that supports this statement. Specifically, while several studies introduce and discuss contributing factors and the potential for adverse events within transitional care, very few studies measure the actual extent and frequency of adverse outcomes affecting elderly patients who are transferred between different settings in healthcare. Despite the problem related to generalization across countries the situation appears to be typical. In Figure 1, we outline the prominent risk factors described in the literature we reviewed.

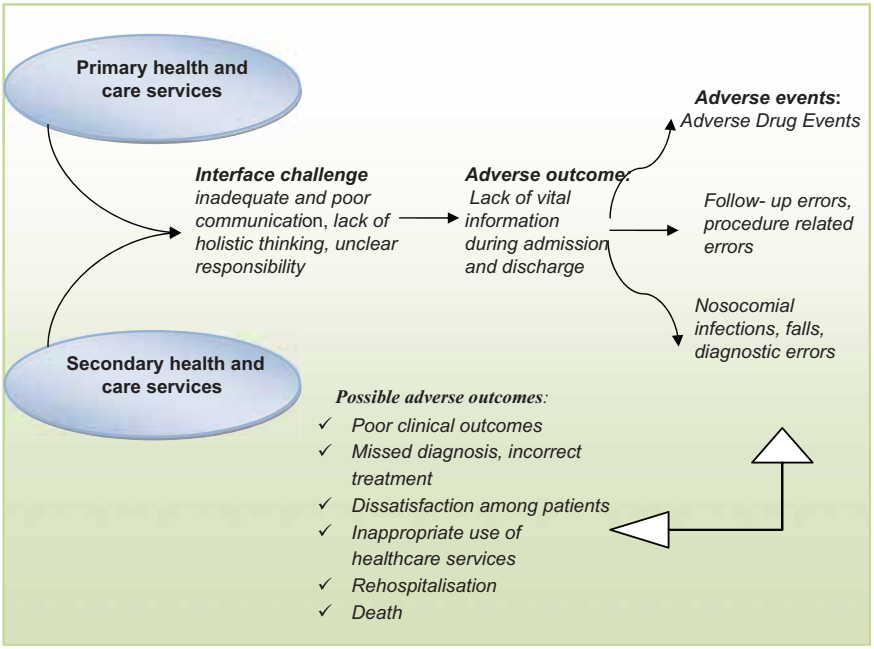

Figure 1. Identified risk factors within transitional care.

Danielsen & Fjær (2010) suggest that the interaction between hospital and primary care are characterized by ineffective communication and a lack of holistic thinking. Each party tends to focus on its own tasks and resources and not on the system as a whole, which is paradoxical given that it is the system the patient actually experiences. The responsibility for improving the interaction, cooperation and communication across the interfaces appears to "fall between two stools" where either part seems to feel accountable (Kvamme et al. 2000; Coleman et al. 2003). We believe one should be concerned with enabling professional groups across different settings to understand their roles and make them feel that their work is complementary with that of others within the health care system (Kvamme et al. 2000). Role clarity with clear lines of responsibility for follow-up must be established to prevent misunderstandings (Gandhi 2005). Each of the organizations, units, professions, and actors during primary and secondary care services might hold valuable intentions according to patient safety, but the dependencies among the actors, the frequency of transitions and interactions, and the variability in risk perception along the health care system (Kewell 2006; Hood et al. 2001) create challenges in creating safe and reliable health care delivery. From a holistic perspective, multidisciplinary collaboration between all health care professionals is necessary to facilitate safe transitional care for elderly patients (Dunnion & Kelly 2008).

The system of care seems to be most vulnerable at transitions, with discontinuities in care arising mainly from poor information transfer and faulty communication patterns. Effective care transitions depend on collaboration across primary and secondary service levels. However, various service levels often function in isolation, and there is no way to hold providers accountable when problems arise (Coleman et al. 2004). This gap gives rise to the potential of fragmentation of care, possible leading to medical errors, service duplication, inappropriate care, and critical elements of the care plan "falling through the cracks". Ultimately, poorly executed care transitions may subsequently lead to poor clinical outcomes, dissatisfaction among patients, and inappropriate use of hospitals, emergency, postacute and ambulatory services (Coleman & Boult 2003).

Inadequate and poor communication may result in lack of transferring vital information during inter-organizational transitions. This in turn poses a potential risk for medical errors

and adverse events because essential elements of the patients care plan developed in one setting are not communicated and followed up at the next care setting (e.g. preparation for the goals of care delivered in the next setting, arrangements for follow-up appointments and laboratory testing and reviewing the current medication regimen) (Coleman et al. 2005). When elderly patients are being transferred between health care settings it is essential that the receiving health teams have accurate information concerning the patients' medications, advance directives, allergies, and previous medical history (Morley 2010). Failure to follow—up on abnormal test results is a critical weakness in patient safety (Gandhi 2005). Diffused responsibility is a concern within handoffs, in that it can lead providers across the inpatient and outpatient settings to assume that someone else is going to follow up on test results, in the worst case resulting in none taking responsibility (Gandhi 2005). According to Bull (2000) re-admissions to hospitals are reduced once community nurses receive effective communication from the hospital care team.

The literature review suggests that most post-discharge studies have usually focused on adverse drug events with very little data on the other types of adverse events or medical errors stemming from transitional care (Tsilimingras & Bates 2008). There are limited data except from the studies conducted by Foster and colleagues (2003, 2004) that examine multiple types of adverse events simultaneously related to post-discharge adverse events. Beyond these studies there are limited data regarding the frequency of procedure-related events, nosocomical infections, therapeutic errors, pressure ulcers, diagnostic errors and falls in the outpatient setting (Tsilimingras & Bates 2008). Some studies have identified and revealed high–risk patients during transitional care are related to specific diagnosis groups (Spehar et al. 2005). For example, numerous efforts have been made to improve transitional care for patients with heart failure, stroke and complex care needs. However, few efforts have specifically addressed transitional adverse events in the elderly in a general population (Tsilimingras & Bates 2008). To improve safety within transitional care we first need to have information on the incidence and type of adverse events occurring (Foster et al. 2003, 2004).

6 CONCLUSIONS

It is widely recognized that effective information transfer between health professionals is vital to optimise patient care and in developing safe outcomes (Foster et al. 2002). Despite an increase in studies focusing on transitions, there are still gaps in the literature in terms of how patient information should be transferred in a way that reduces risk and strategies to improve transitional care are lacking (LaMantia et al. 2010). Despite the fact that problems associated with transitional care of older people have been identified little empirical research exists (Payne et al. 2002). However, the literature suggests that preventable adverse events are likely to occur within transitional care of the elderly due to breakdowns in communication across care providers. Even if there are on-going evidence based interventions aimed at improving the safety of transitional care handovers, these are plagued with the age-old problem of not translating the findings of current research into improved practice (Johnson & Arora 2009). Adverse care and problems engendered by transitions and discontinuities in care should be recognized as an important area of concern for elderly (Tsilimingras & Bates 2008).

REFERENCES

Alamberti R, Auroy Y, Berwick D, Barach P (2005) Five Systems Barriers to Achieving Ultrasafe Health Care. *Annals of Internal Medicine*. 142 (9):756–764.

Arora VM, Johson JK, Meltzer Do et al (2008) A theoretical framework and competency-based approach to improving handoffs. *Qual Saf Health Care*. 17:11–14.

Benbassat J, Taragin M (2000) Hospital readmissions as a measure of quality of health care. *Arch Internal Medicine.* 160:1074–1081.

Boockvar K, Fishman E, Kyriacou E et al (2004) Adverse events due to discontinuations in drug use and dose changes in patients transferred between acute and long term care facilities. *American Medical Association.* Vol 164 (5):545–550.

Boutilier S (2007) Leaving critical care. *Dimensions of Critical Care Nursing*. Vol 26. No 4.
Brown EL, Raue PJ, Mlodzianowski AE (2006) Transition to home care: quality of mental health, pharmacy, and medical history information. *International Journal of Psychiatry in Medicine*. 36 (3): 339–349.
Bull MJ (2000) Discharge planning for older people: a review of current research. *British Journal of Community Nursing*. 5: 75–80.
Coleman EA (2003) Falling through the Cracks: Challenges and opportunities for Improving Transitional Care for Persons with Complex Care Needs. *Journal of the American Geriatric Society*. Vol 51. No 4: 549–555.
Coleman EA, Boult C (2003) Improving the Quality of Transitional Care for Persons with Complex Care Needs. *Journal of the American Geriatric Society*. Vol 51. No 4:556–557.
Coleman EA, Min SJ, Chomiak A et al (2004) Posthospital Transitions: Patterns, Complications, and Risk Identification. *Health Services Reserch.* Vol 39. No 5.
Coleman EA, Smith JD, Raha D et al (2005) Posthospital medication discrepancies: prevalence and contributing factors. *Arsh Intern Med.* Vol 165:1842–1847.
Corbett CF, Setter SM, Daratha KB, Neumiller JJ et al (2010) Nurse identified hospital to home medication discrepancies: implications for improving transitional care. *Geriatric Nursing.* Vol 31. No 3.
Cornish PL, Knowles SR, Marchesano R et al (2005) Unintended medication discrepansies at the time of hospital admission. *Arch Intern Med.* 28;165 (4):424–429.
Cook R, Render M, Woods D. (2000) Gaps in the continuity of care and progress on patient safety. *British Journal of Anaesthesia*. 320, pp. 791–794.
Danielsen B, Fjær S (2010) Erfaring med å overføre syke eldre pasienter fra sykehus til kommune. *Forskning.* 1 (4):28–34.
Dean B, Schachter M, Vincent C, Barber N (2002) Prescribing errors in hospital inpatients: their incidence and clinical significance. *Qual Saf Health Care.* Vol 11:340–344.
Dunnion ME, Kelly B (2008) All referrals completed? The issue of liaison and documentation when discharging older people from an emergency department to home. *Journal of Clinical Nursing.* 17: 2471–2479.
Foster DS, Paterson C, Fairfield G (2002) Evaluation of immediate discharge documents – room for improvement? *Scott Med J.* 47 (4):77–9.
Foster AJ, Murff HJ, Peterson JF et al (2003) The incidence and severity of adverse events affecting patients after discharge from the hospital. *Ann Intern Med*. 138:161–167.
Foster AJ, Clark HD, Menard A et al (2004) Adverse events among medical patients after discharge from hospital. *CMAJ*. 170 (3).
Gandhi TK (2005) Fumbled Handsoffs: One Dropped Ball after Another. *Ann Intern Med.* 142: 352–358.
Gleason KM, McDaniel MR, Feinglass J (2010) Result of the medications at transitions and clinical handoffs study: An analysis of medication reconciliation errors and risk factors at hospital admission. *Journal of General Internal Medicine.* Vol 25. No 5: 441–447.
Garaasen H, Johnsen R (2007) The quality of communication about older patients between hospital physicians and general practitioners: a panel study assessment. *BMC Health Service Research.* 7:133.
Halasyamani L, Krioalani S, Coleman E, Schnipper J et al (2006) Transitions of care for hospitalized elderly patients—development of a discharge checklist for hospitals. *Journal of Hospital Medicine*. Vol 1. No 6.
Hellesø R, Fagermoen MS (2010) Cultural diversity between hospital and community nurses: implications for continuity of care. *International Journal of Integrated Care.* Vol 10.
Hellesø R, Lorensen M, Sorensen L (2004) Challenging the information gap-the patients transfer from hospital to home health care. *Journal of Medical Informatics.* 73:569–580.
Hood C, Rothstein H, Baldwin R (2001) *The Government of Risk—Understanding Risk Regulation Regimes.* Oxford, Oxford University Press.
The Institute of Medicine (IOM) (2000) To Err is Human: Building a Safer Health System. Washington, DC: National Academy.
Johnson JK, Arora VM (2009) Improving clinical handovers: creating local solutions for a global problem. *Qual Saf Health Care.* Vol 18. No 4.
Kewell BJ (2006) Language games and tragedy: The Bristol Royal Infirmary disaster revisited. Health, Risk & Society. 8(4), pp. 359–377.
Kripalani S, LeFevre F, Phillips CO (2007) Deficits in Communication and Information Transfer between Hospital—Based and primary care physicians. *JAMA*. Vol 297. No 8.

Kvamme OJ, Olesen F, Samuelsson M (2001) Improving the interface between primary and secondary care: a statement from the European Working Party on Quality in Family Practice. *Quality in Health Care*. 10:33–39.
LaMantia MA, Scheunemann LP, Viera A et al (2010) Interventions to improve transitional care between nursing homes and hospitals: A Systematic Review. *JAGS*. 58:777–782.
Leape LL, Lawthers AG, Brennan TA et al. (1993) Preventing medical injury. *Quali Rev Bull*. 19: 144–149.
Leonard M, Graham S, Bonacum D (2004) The human factor: the critical importance of effective teamwork and communication in providing safe care. *Qual Saf Health Care*. 13.
Meara JR, Wood JL, Wilson MA, Hart MC (1992) Home from Hospital: a survey of hospital discharge arrangements in Northamptonshire. *Journal of Public Health Medicine.* 14, pp. 145–150.
Moore C, Wisnivesky J, Williams S et al (2003) Medical errors related to discontinuity of care from an inpatient to an outpatient setting. *Journal of General Internal Medicine.* Vol 18: 646–651.
Morley JE (2010) Transitions. JAMDA. Vol 11/9:607–611.
Naylor M, Keating SA (2008) Transitional care. *American Journal of Nursing*. Vol 108. No 9.
Payne S, Kerr C, Hawker S et al (2002) The communication of information about older people between health and social care practitioners. *Age and Aging*. 31:107–117.
Perren A, Previsdomini M, Cerutti B et al (2009)Omitted and unjustified medications in the discharge summary. *Qual Saf Health Care*. Vol 18:205–208.
Poy CL, Poon EG, Karson AS (2005) Patient safety concerns arising from test results that return after hospital discharge. *Ann Intern Med.* 143:121–128.
Pippens JR, Gandhi TK, Hamann C et al (2008) Classifying and predicting errors of inpatient medication reconciliation. *J Gen Intern Med*. Vol 23. No 9.
Rognstad S, Strand J (2004) Vet fastlegen hvilke medisiner hjemmesykepleien gir pasientene? *Tidsskrift for Den Norske Lægeforening*. 6 (124):810–812.
Rothschild JM, Bates DW, Leape LL (2000) Preventable medical injuries in older patients. *Arch Intern Med.* Vol 160 (9).
Schnipper JL, Kirwin JL, Cotungo MC et al (2006) Role of pharmacist counseling in the preventing adverse drug events after hospitalization. *Arch Intern Med.* Vol 166.
Sharit J, McCane L, Thevenin DM, Barach P (2008) Examining links between sign-out reporting during shift changeovers and patient management risks. *Risk Anal.* 28 (4):983–1001.
Spehar AM, Campbell RR, Cherrie C et al (2005) Seamless Care: Safe patient Transitions from hospital to home. *Advances in Patient Safety*. Vol 1.
Thomas EJ, Brennan TA (2000) Incidence and types of preventable adverse events in elderly patients: population based review of medical records. *BMJ*. Vol 320.
Thomas V, Lambert S (2008) An ethnographic study of intermediate care services in Wales: the hidden work. Journal of nursing management 16, 181–187.
Tsilimingras D, Rosen AK, Berlowitz DR (2003) Patient safety in Geriatrics: A Call for Action. *Journal of Gerontology*. Vol 58. No 9: 813–819.
Tsilimingras D, Bates DW (2008) Addressing Postdischarge Adverse events: A Neglected Area. *The Joint Commission Journal on Quality and Patient Safety.* Vol 34. No 2.
Vira T, Colquhoun M, Etchells E (2006) Reconcilable differences: correcting medication errors at hospital admission and discharge. *Qual Saf Health Care*. Vol 15:122–126.
Unroe KT, Pfeiffenberger T, Riegelhaupt S (2010) Inpatient medication reconciliation at admission and dsischarge: a prospective cohort study of age and other risk factors for medication discrepancies. *The American Journal of Geriatric Pharmacotherapy*. Vol 8. No 2.
Wachter R (2008) Understanding patient safety. The McGraw-Hill companies.
Walraven C, Seth R, Austin PC et al (2002) Effect of discharge summary availability during postdischarge visits on hospital readmission. *J Gen Intern Med*. 17:186–192.
Werret JA, Helm RH, Carnwell R (2001) The primary and secondary interface: the educational needs of nursing staff for the provision of seamless care. *Journal of Advanced Nursing*. 34 (5)629–638.
Wong JD, Bajcar JM, Wong GG et al (2008) Medication reconciliation at hospital discharge: evaluating discrepancies. *Ann Pharmacother.* Vol 42. No 10:1373–1379.
Wilson S, Ruscoe W, Chapman M (2001) General practitioners – hospital communication: A review of discharge summaries. *Journal of Quality in Clinical Practice*.
World Health Organization (WHO). Patient Safety. 1 November 2007. http://www.who.int/patientsafety/events/07/01_11_2007/en/index.html.

Paper II

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Interventions to improve patient safety in transitional care – a review of the evidence

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Abstract: When a patient's transition from the hospital to home is less than optimal, the repercussions can be far-reaching – hospital readmission, adverse medical events, and even mortality. Elderly, especially frail older patients with complex health care problems appear to be a group particularly at risk for adverse events in general, and during transitions across health providers in particular. We undertook a systematic review to identify interventions designed to improve patient safety during transitional care of the elderly, with a particular focus on discharge interventions. We searched the literature for qualitative and quantitative studies on the subject published over the past ten years. The review revealed a set of potential intervention types aimed at the improvement of communication that contribute to safe transitional care. Intervention types included profession-oriented interventions (e.g. education and training), organisational/culture interventions (e.g. transfer nurse, discharge protocol, discharge planning, medication reconciliation, standardized discharge letter, electronic tools), or patient and next of kin oriented interventions (e.g. patient awareness and empowerment, discharge support). Results strongly indicate that elderly discharged from hospital to the community will benefit from targeted interventions aimed to improve transfer across healthcare settings. Future interventions should take into account multi-component and multi-disciplinary interventions incorporating several single interventions combined.

Keywords: Transitional care, elderly, patient safety, adverse events, interventions

1. Introduction

Transitional care has been recognized as a high risk area for patients due to the growing evidence indicating a strong correlation between patient handovers and adverse events [1-3].Transitional care has been defined as a set of actions designed to ensure the coordination and continuity of health care as patients transfer between different levels of care within the same or other locations [4]. The main goal of transitional care is optimal patient care and safety [5]. Elderly, especially frail older patients with complex health care problems appear to be a group particularly at risk for adverse events in general, and during transitions across health providers in particular [6-7]. Elderly typically receive care from many providers and move frequently within and across health care settings [4] and has been defined as a research priority [8]. The type and incidence of adverse events reported in the literature relate to adverse drug events, procedure related events, diagnostic test follow-up errors, nosocomial infections and falls. Ineffective care processes, poor communication and deficient documentation represent the major risk factors associated with these adverse events [9]. The physical and mental health of elderly may deteriorate after discharge. They may experience changes in the treatment regimen, and discontinuities during their transitions. In addition many elders often have a limited support system [10]. Combined with poor general health this leaves

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the elderly at high risk for rehospitalization, morbidity and mortality after discharge. The tendency in today`s health care systems is that patients are often discharged "quicker and sicker" which in turn challenges the health care team to adequately prepare and complete the discharge process (i.e., planning, support and follow-up). It is vital that healthcare providers have the proper information to act as representatives for the elderly patient. The pursuit of patient safety interventions within transitional care of frail elderly should thus ideally be designed to address the current risk factors.

2. Aim

This paper focuses upon interventions designed to improve patient safety within transitional care of the elderly. We focus on the effects of discharge interventions on patient safety, e.g adverse events confined to elderly patients (>65) who have been discharged either home or to a nursing home from tertiary care hospitals. The paper seeks to identify and evaluate the effects of the interventions in terms of effectiveness and efficiency of care processes.

3. Methods

A systematic literature search was conducted by using the electronic databases: PubMed, Medline, Cinahl, Academic Search Elite, the Cochrane Database of Systemic Reviews and the controlled trials register and in addition we scanned the reference lists of selected articles (snowballing). The following search terms were used: "discharge planning", "patient care planning", "follow-up care", "transitional care", "handoff", and "clinical pathways", all concepts in combination with "patient safety" AND/OR "interventions" AND "elderly". The following journals' contents pages were searched electronically for relevant papers: Journal of clinical nursing, Social science and Medicine, Aging and society, Age and Aging, Social care in the community, International Journal of Integrated Care. The search included randomized studies, review articles and descriptive studies and was limited to English language articles in peer-reviewed journals. The review concentrates on recent literature published between 2000 and 2010. The criteria for inclusion were intervention studies proposed to improve transitional care, and more specifically, hospital discharge. The sample subjects were older patients (over age of 65) with a medical condition (e.g., chronic disease or frail elderly). We excluded studies of patients with a surgical condition or a mental/psychiatric condition from the review. Studies were eligible for inclusion if they described or measured the effects of discharge interventions on adverse patient outcome (i.e. readmission rates, rehospitalization, adverse events, medical errors, delay in diagnosis or treatment, mortality, patient, family and carer satisfaction).

4. Results

A substantial literature regarding discharge arrangements for elderly patients from hospital to home exists. The initial literature search identified 569 publications of which 37 met the inclusion criteria: 12 were review [8,11-21] papers , 11 were randomized controlled trials (RCT) [22-32], and 10 were descriptive studies [33-42]. The review revealed several systematic reviews that assess the effects of supporting elderly discharge from hospital to home. On average at least one review paper has been published each year for the past ten years. The oldest article included data from 1966 and the most recent one from 2010. A majority of review papers included solely RCT studies and other comparative designs. Two reviews included both qualitative and quantitative designs, and one review included evidence of descriptive studies solely. Some of the reviews included studies in which interventions target mixed patient population, elders in general (>65) while others were restricted to studies with a specific patient group, in particular patients with congestive heart failure. All the review articles differed to some extent in their objectives. Several reviews state that there exists uncertainty about the overall effectiveness of discharge arrangements. The meta-review by Mistian and colleagues (2007) concludes that there is overall very limited evidence that discharge interventions are effective. Occasionally, significant results are achieved due to local factors that may not be generalizable. For instance, comprehensive discharge planning and interventions in patients with heart failure have been proven effective. However, even though significant effects overall are absent, several reviews provide evidence that discharge arrangements for the elderly population is of value and has beneficial effects on reducing readmission rates and drug related problems. Interventions which address family and educational components show promising results. There is evidence indicating that interventions should commence well before discharge to have the best preconditions for successful results. A common feature recognized by most reviews is that interventions combining discharge planning and discharge support tend to yield the greatest effects. In the review of primary trials and studies the literature addressed several interventions and revealed a set of potential intervention types aimed to improve safe transitional care (see table 1).

Table 1
Interventions with positive outcomes

Author and year	Design	Type of intervention	Sample	Outcome Measures	Main results
Naylor et al 1999	Randomized clinical trial	Comprehensive discharge planning and home follow-up (at 2,6,12, 24 weeks) protocol designed for elders at risk for poor outcomes after discharge and implemented by advanced practise nurse	A total of 363 patients (age >65) 186 in the control group and 177 in the intervention group	Readmission, time to first readmission, acute care visits after discharge, cost, functional status, depression and patient satisfaction	An advanced practice nurse-centered discharge planning and home care intervention for at-risk hospitalized elders reduced readmissions, lengthened the time between discharge and readmission, and decreased the costs of providing health care. However there were no significant group differences in postdischarge acute care visits, functional status, depression or patient satisfaction.
Caplan et al 2004	Prospective randomized controlled trial	Comprehensive geriatric assessment (CGA)	A total of 575 (age >75) (intervention n=293; control n=282)	Primary; all admissions to the hospital within 30 days of the initial ED visit. Secondary: Elective and emergency admissions , and nursing home admissions and mortality.	Intervention patients had a lower rate of all admissions to the hospital during the first 30 days after the initial ED visit (16.5% vs 22.2%;*P*=0.048), a lower rate of emergency admissions during the 18-month follow-up (44.4% vs. 54.3% *P*=0.007). There was no difference in admission to nursing homes or mortality.
Naylor et al 2004	Randomized controlled trial	An advanced practice nurse directed discharge planning and home follow up (through 52 weeks postindex hospital discharge) protocol	A total of 239 (age >65) (control n= 121; intervention n=118)	Time to first rehospitalisation or death, number of rehospitalizations, quality of life, functional status, cost and satisfaction with care.	Time to first readmission or death was longer in intervention group patients. At 52 weeks, intervention group patients had fewer readmissions and lower mean total cost. However, only short term improvements were demonstrated in the intervention group concerning overall quality of life and patient satisfaction.
Anderson et al 2005	Randomized controlled trial	A comprehensive community hospital-based heart failure program. (Discharge planning and follow-up).	A total of 121 patients (mean age 78.5) Intervention n= 44: control n= 77)	Readmission rate and utilization of home health care services	Intervention subjects had an 11.4% readmission rate within 6 months, compared with a 44.2% readmission rates in control subjects. There was a significant increase in the number of both skilled nurse visits and home health aide visits required in the control group.
Sinclair et al 2005	Randomized controlled trial	A single-blind randomised controlled trial comparing home-based intervention by a nurse with usual care for patients with cardiac problems	A total of 324 Patients (qge>65) (intervention n= 163; control group n=161).	Deaths, hospital readmissions and use of outpatient services	At 100 day follow-up there was no difference in deaths, activities of daily living or overall quality of life, but those in the intervention group scored significantly better on the confidence and self-esteem subsections. The intervention group had fewer hospital readmissions (35 versus 51, relative risk 0.68, 95% CI 0.47-0.98, P < 0.05).
Coleman et al 2006	Randomized controlled trial	Care transition intervention. Intervention patients received (1) tools to promote cross –site communication; (2) encouragement to take	A total of 712 patients (age>65) (intervention n= 360; control n= 352)	Rates of rehospitalisation at 30, 90 and 180 days after hospital discharge	Intervention patients had lower rehospitalisation rates at 30 days and at 90 days than control subjects. The mean hospital cost were lower for intervention patients vs control at 180

		a more active role in their care; and, (3) continuity across settings and guidance from a "transition coach"			days.
Schnipper et al 2006	Randomized trial	Patient counselling and follow-up by pharmacist	A total of 178 patients (mean age 58.4) (intervention n= 92; control n = 84)	Rate of preventable adverse drug events (ADEs)	Medication review, discharge counselling and telephone follow-up by pharmacist were associated with a significant lower rate of preventable ADEs 30 days after hospital discharge. Preventable medication related ED visits and hospital readmissions were similarly reduced. On the other hand the groups did not differ significantly with respect to total ADEs, total health care utilization, or patient satisfaction.
Midlov et el 2008 a	A prospective intervention with retrospective controls	Use of medication report at discharge	A total of 427 patients (age>65)(intervention n =248;control group n=179)	Need for medical care in hospital or primary care within three months after discharge from hospital.	The use of medication report reduced the need for medical care due to medication errors. Of the patients with medication report 11 out of 248 (4.4%) needed medical care because of medication errors compared with 16 out of 179 (8,9) of patients without medication report. The use of medication report also reduced the need for administrative corrections due to medication errors.
Midlov et al 2008 b	A prospective intervention with retrospective controls	Use of medication report at discharge describing all medication changes during hospital stay and the reason for these changes	A total of 427 patients (age>65) (intervention n =248;control group n=179)	Number of medication errors	79 (32%) patients in the intervention group had at least one medication error as compared with 118 (66%) patients in the control group. In the intervention group 15 % of the patients had errors that were considered to have moderate or high risk of clinical consequences compared with 32% in the control group.
Courtney et al 2009	Randomized controlled trial	Comprehensive nursing and physiotherapy assessment and follow-up	A total of 128 patients(age>65) (intervention n= 64;control n=64)	Emergency health service utilization and high-related quality of life 4,12 and 24 weeks after discharge.	The intervention group required significantly fewer emergency hospital readmissions (22% of intervention group vs 47% of control group) . The intervention group reported significantly greater improvements in quality of life than the control group.
Rytter et al 2010	Randomized controlled trial	Follow-up program by GPs and district nurses.	A total of 331 patients /(age>65) intervention n= 166;control n= 165)	Primary: Readmission and any kind of concordance between the GPs knowledge of the medical treatment and what the patient was actually taking. Secondary: degree to which the GP implemented the recommended follow-up as described in the hospital discharge letter, cost, functional ability, death rate, patient satisfaction and self rated health.	Control group patients were more likely to be readmitted than intervention group patients (52% vs 40% *P*=0.03). In the intervention group, the proportions of patients who used prescribed medication of which the GP was unaware (48% vs 34% and who did not take the medication prescribed by the GP (39%vs 28%) were smaller than in the control group.

As several studies were identified, table 1 is limited to interventions that demonstrate positive effects on measures related to the prevention of adverse patient outcomes. These intervention types included *profession-oriented interventions* (e.g. education and training); *organisational interventions* (e.g. transfer nurse, transition coach, discharge protocol, discharge planning, discharge follow-up, medication reconciliation, standardized discharge letter, electronic tools); or *patient-and next of kin- oriented interventions* (e.g. patient empowerment, discharge support). The primary articles included in our review overlap somewhat with those cited by other review papers. Despite the variety of interventions reported in the literature, the review did not provide evidence for the validity of one intervention over others. However, some interventions have achieved good results and therefore deserve attention. The characteristics of these interventions are presented in table 2. Supplementary comments for each are then given.

Table 2
Features of successful interventions

Features of successful interventions
➢ Interventions that commence at an early stage and are maintained throughout hospitalization and the post-discharge period. ➢ Interventions that consist of a key health care worker which acts as a discharge coordinator. ➢ Interventions that include patient participation and /or education. ➢ Interventions that involve family caregivers. ➢ Interventions which undertake a multidisciplinary approach. ➢ Curriculum interventions teaching transitional care. ➢ Pharmacy interventions- medication reconciliation. ➢ Standardized medication reports. ➢ Comprehensive transitional care programs with multi-interventional components.

➢ *Discharge planning and support*

Two categories of discharge interventions, are divided in discharge preparation and discharge support [16]. A common feature in several studies is that combining hospital discharge preparation/planning (interventions that mainly take place during admission in the hospital) and discharge support (interventions that mainly take place after discharge from the hospital) for older patients provides significant results when compared with interventions provided in the hospital or community setting only. The effects, especially on readmission risk reduction appear most apparent in interventions provided in both care settings [22-24, 27]. However, it must be mentioned that Rytter and colleagues [32] among others [26] achieved positive but not significant effects based solely on discharge support including joint follow-up home visits involving both the general practitioner and the district nurse. Halasyamani and colleagues [37] highlight and emphasize the need for follow-up appointment within at most 2 weeks of discharge or sooner with patients with fragile clinical conditions.

➢ *Key - coordinator*

Several intervention studies have designated a nurse, most frequently an advanced practice registered nurse as the intervention clinical manager or leader [21-22, 24]. Naylor and colleagues [21] identified in their review nine studies that reported a statistically positive effect on readmission. The common feature among these interventions was that they all relied on a nurse as the clinical leader or manager of care. Interventions that included a key liaison person, or discharge coordinator to organize information exchange and transfer had in addition to improving communication a positive impact on patient and caregiver satisfaction [12]. Payne and colleagues [12] stress that there is still insufficient research evidence to determine from which professional background this key-coordinator should come and whether they should be based in the hospital or community. Naylor and colleagues [22] successfully tested the effectiveness of a comprehensive advanced practice nurse (APN) centered discharge planning and follow-up intervention, designed for older people at risk for rehospitalization. The APN centered discharge intervention was found to reduce readmission, lengthen the time between discharge and readmission and decrease cost. The intervention included a comprehensive patient and caregiver assessment of knowledge, education, caregiver burden and resources and an individualized and documented discharge plan developed in collaboration with the caregiver, patient, physician and other health team members. The post discharge follow-up support in terms of home visits and telephone contact was also a part of the intervention. It is stressed that APNs involvement throughout the transition from hospital to home provided a safety net designed to prevent medication and other medical errors and assure accurate transfer of information. Naylor and colleagues [24] tested a similar APN directed intervention program to elder patients with heart failure, achieving even better results. The authors argued that the success was largely driven by two factors; (1) the continuity of care provided by the same APN who coordinated the patients discharge plan and implemented in the patients home; and, (2) the use of highly skilled APNs who are prepared to use a holistic approach to address the complex need of patients and their caregivers.

➢ *Patient and family involvement/Education*

Compelling evidence supported by both qualitative [34,41] and quantitative

(22,24,27)studies highlight the importance of involving patient and family care givers in the hospital discharge process. Numerous studies on discharge planning have identified the importance of the role of the family, suggesting it as one of the most significant factors influencing the success of discharge planning for frail older patients [43]. Studies indicate that patients express clear preference for participation [41] and that approximately 46 % of families reported little or no involvement in discharge planning [33]. Evidence has shown that family caregivers who were included in discharge planning had significantly higher scores on satisfaction, feelings of preparedness and acceptance of the caregiver role [34]. Providing patients with educational sessions pre- and post- discharge have been found to have positive effects. Parker and colleagues [13] imply that educational programs/ interventions represent the single most positive effect of any single type of intervention, and stress that interventions which empower patients by paying particular attention to their specific educational needs should be of great interest to the field.

- *Multidisciplinary approach*

A multidisciplinary approach to the provision of services for patients following discharge is viewed as a best practice [17]. Avlund and colleagues [44] demonstrate that elders discharged from medical wards most likely benefit from interdisciplinary home-visits following discharge. A multidisciplinary team approach is applied in several studies which report positive effects [22-25,45]. All the health care professionals interviewed in the study by Bull and Roberts [34] identified a multi-disciplinary team approach as critical for a proper discharge because elders have complex needs and each discipline brought different perspectives in planning for the elders` needs following hospitalization. In addition the interdisciplinary team emphasized that members of the team learned from each other, valued each others' perspectives and came to trust the judgement of other team members.

- *Education and training*

Historically there have been few curricular/curriculum interventions teaching transitional care to physicians. However, it has been recognized that curricular interventions teaching this topic to physicians in training and physicians have increased dramatically over the past ten years [46]. Study findings from an education intervention [40] reveal that medical students transitional care skills improved after the implementation of a transition in care curriculum. In addition students also rated the usefulness of such education above all other project work in all required clerkships. Another educational intervention conducted by Ouchida and colleagues [39] reported similar significant results using a pre and post test design. This multi-modal educational intervention for medical students increased their transitional care knowledge. After the intervention 56 % (vs 14.9%) identified medication errors as the most common source of adverse events after discharge. Significantly more participants reported feeling competent or expert in safely discharging chronically ill patients (66.3% vs. 9.8 %) and in educating patients about discharge medications. Participants also reported changes in transitional care behaviours after educational interventions to ensure safe transitions [39]. It is an imperative to implement interventions that teach physicians and nurses to recognize their role within the interdisciplinary team and their responsibility to ensure safe transitions at an early stage of clinical training [4].

- *Pharmacy interventions / medication reconciliation*

It is widely known that older age and polypharmacy are risk factors for medication discrepancies and errors [47-48].It is also widely known that medication discrepancies occur commonly during hospital discharge. All the studies included in the review by Garcia-Caballos and colleagues [19] underscored the high frequency and complexity of drug related problems in elderly patients after hospital discharge. Several studies test the impact of pharmacist interventions at discharge aimed to prevent and reduce adverse drug events following discharge. Studies indicate that pharmacists may play an important role in preventing prescribing errors or medical related problems [28,49,50] Schnipper and colleagues [28] showed that medication review, discharge counseling and telephone follow-up by a pharmacist were associated with a significant lower rate of preventable adverse drug events 30 days after hospital discharge. The same study also revealed that the medical team often misunderstood the patients` preadmission medication regimen and carried these inaccuracies to the discharge medication orders. Similar findings have been identified by Glintborg and colleagues [38] revealing that the hospital had insufficient knowledge of prescriptions and that they only reported half of the administered drugs in the discharge letter. The use of a pharmacist transition coordinator improved aspects of inappropriate use of medicines across health sectors [28, 50-51]. Pharmacist review of medication list may help identify omitted or indicated medications on transfer [8]. We also found studies that question the benefit of such interventions [52]. However, the studies included in the review by Hanlon and colleagues [14] provided considerable evidence that clinical pharmacy interventions reduced the occurence of drug related problems for elderly,

including improvements in medication adherence and suboptimal prescribing. There was limited evidence that such interventions reduce morbidity, mortality or health care costs. Medication reconciliation includes the collection of a complete medication list from the patient at the point of entry; using that information when prescribing medications; and, comparing the new medication orders against the original medication list to ensure that all the correct medications are ordered or held as appropriate [53].

- *Standardized medication reports/discharge summary*

The use of standardized medication reports at discharge have also been proven beneficial. Midlov and colleagues [30] conduced an intervention study to assess the effects on medication errors when elderly patients are transferred from the hospital to primary care by use of a structured medication report. In contrast to the regular information exchange this report also described all medication changes during hospital stay and the reasons for these changes. The study demonstrated that the use of the developed structured medication report reduced the number of medication errors by more than 50%. Midlov and colleagues [29] also tested if the same medication report could reduce the number of patients with clinical outcomes due to medication errors. They concluded that the medication report appears to represent an effective tool to decrease adverse clinical consequences when elderly patients are discharged from the hospital. Several studies have proposed standardized summaries or checklist for elderly patients in order to improve information transfer [37,54]. However, present information on the implementation or evaluation of these summaries or checklists is lacking.

- *Comprehensive transitional care programs*

The studies conducted by Naylor and colleagues [22,24] and Coleman and colleagues [27], focus on long term effects on rehospitalization. All studies are distinguished by the use of comprehensive transitional care programs which undertake a multi-interventional component approach. These comprehensive interventional care programs address several primary factors (highlighted in table 1) that are considered significant for successful discharge. Coleman and colleagues [27] reported significant reduction in readmission at 180 days post discharge compared to the control group. Similarly, Naylor and colleagues [22] achieved significant reduction in readmission rates at 24-weeks post-discharge. Naylor and colleagues argue that comprehensive transitional care programs have not been adopted due to lack of Medicare reimbursement, absence of marketing forces, and the challenges such care present to the culture of current practice. These challenges are characterized by the organization of care in distinct and separate silos, and limited longitudinal integration of physician and nursing care to support patients` needs.

5. Discussion

Elderly patients benefit from targeted interventions aimed at facilitating cross site communication and accurate information transfer in transitional care. Some studies report intervention effects related to decrease in adverse drug events and readmission rates, and an increase in patient and family satisfaction. Others demonstrate effects on cost effectiveness. Strong evidence of effectiveness seems principally to be limited to specific diagnostic groups managed in specific settings. This may suggest that developing a single approach within transitional care of the elderly is not possible because of the diversity and complexity of elderly health care [55]. This confirms that one–size fits all approaches to transitional care may not be sufficient [56]. Improving safe transitional care of the elderly will require future interventions that involve a multi-component approach which incorporates and takes into account the characteristics presented in table 2. We encourage that future interventions must focus in particular on comprehensive discharge planning combined with follow-up care. Interventions must incorporate patient participation and family involvement to a greater extent, where one must consider and take into account their preferences, goal settings, and an individualized care plan.

Educational efforts that strengthen patient self-management have been proven effective. Though the family is often the first line of defense against problems within transitional care, little work has been done that focuses on building partnerships between patients, families and healthcare providers [57]. Poor communication between patients, family and health professionals, including deficient documentation is one of the primary obstacles to improving the patient discharge process [18]. There is a need for further investigation into the experiences and needs of older people and their families at home following hospitalization [17]. Interventions should further be based on effective multidisciplinary teamwork both within the hospital and between the hospital and the community. This teamwork should be based on clear and explicit core competencies [58].

This review reveals that interventions often focus on single groups such as nurses, physicians, patients or families, social workers, or occupational therapists. To our knowledge few studies undertake a multidisciplinary approach which involves multiple stakeholders. An interesting and somewhat surprising finding also recognized by Shepperd and colleagues [20] in their review is the fact that there

are limited studies that involve secondary care settings in discharge planning. In the pursuit of patient safety, models that provide interventions across the hospital –community interface seem essential. Elders often have complex health care needs and each discipline may bring and fulfill different perspectives in planning for the elders' needs following hospitalization. We argue that it is vital to undertake a multidisciplinary approach if the objective is to improve transitional care of the elderly. We also highlight the need to increase the awareness of healthcare providers to the challenges of transitional care and make discharge planning a priority. Both nurses and physicians need formal training in transitional care as a core competency for caring for the elderly population [4]. Content in training and education must reflect skills that are necessary to promote cross-site collaboration (e.g. medication reconciliation and provider- provider communication). Lack of knowledge, experience and ability were all sited as important concerns related to discharge planning effectiveness in the study conducted by Bowles and colleagues [59]. Learning to work effectively in multidisciplinary teams should become an essential component of nursing and medicine education [33, 60].

Last we emphasize that simple tools have been proven effective, such as the use of structured medication reports at discharge, read back checklists, pharmacy interventions, and discharge support and follow-up in primary care. Single interventions appear to achieve short term effects as opposed to multi–component interventions which seem to achieve sustained long term effects especially in regards to reducing rehospitalization and health care utilization.

6. Limitations

A major weakness in this review is the absence of a thorough assessment of the methodological quality of the included studies. We emphazise that the studies are not bias-free, indicating the need for caution when interpreting the results. Several methodological problems limit the interpretation of findings. Ministian [16] stresses that "summing up bias generally results in more bias". However with this in mind, methodological issues have been taken into account in the framing of the conclusions. Most randomized controlled trials stated that control patients received "usual care". However, the authors seldom described what constituted "usual care". The intervention studies also varied considerably in measured outcomes, although a majority used readmission rates to identity poor transitional care. However, there is evidence that this outcome measure has limited value as an indicator of quality of care process in general [61].The sample size in the primary studies also varied in range, from 96 to 712 subjects. Overall, there is lack of large-scale empirical research in this field. Strategies to improve transitional care are insufficient and not sustained [8, 62-63]. Further research is therefore necessary to develop operationalized definitions for safe transitional care.

7. Conclusions

The study results presented in the paper indicate that elderly discharged from hospital to the community will benefit from targeted interventions aimed to improve transfer across healthcare settings and health care providers. Successful interventions have been proven to reduce readmission rates, adverse drug events, health care utilization, increased patient, family satisfaction and decreased cost. The characteristics of these successful interventions have been identified and highlighted in this review. Future interventions should take into account multi-component and multi-disciplinary interventions incorporating several single interventions combined. Finally, an important step is to introduce and highlight transitional care knowledge in curriculums for both nurses and physicians in addition to multidisciplinary training at an early stage of their education.

References

[1] A.J. Foster, H.J Murff, J.F Peterson et al, The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med (2003) 138:161-167.
[2] A.J. Foster, H.D Clark, A. Menard et al, Adverse events among medical patients after discharge from hospital. CMAJ (2004).
[3] C. Moore, J. Wisnivesky, S. Williams et al, Medical errors related to discontinuity of care from an inpatient to an outpatient setting. Journal of General Internal Medicine (2003), 18.
[4] E.A Coleman and C. Boult, Improving the quality of transitional care for persons with complex care needs. J Am Geriatr Soc (2003) 51:4, 556-7.
[5] S. Boutilier, Leaving critical care. Dimensions of critical care nursing (2007) 26:4.
[6] E.A Coleman, Falling through the Cracks: Challenges and opportunities for Improving Transitional Care for Persons with Complex Care Needs. Journal of the American Geriatric Society (2003) 51:4, 549-55.
[7] M. Naylor and S.A Keating, Transitional care. American Journal of Nursing (2008) 108:9.
[8] M.A LaMantia, L.P Scheunemann, A. Viera, et al, Interventions to improve transitional care between nursing homes and hospitals: A Systematic Review. JAGS (2010) 58.
[9] K. Laugaland, K. Aase, P. Barach, Addressing Risk Factors for Transitional Care of the Elderly – Literature review. Healthcare Systems Ergonomics and Patient Safety. Taylor & Francis Group (2011) 1183-191.
[10] D. Tsilimingras and D.W Bates, Addressing postdischarge adverse events: A neglected area. The Joint Commission Journal on quality and Patient Safety (2008) 34: 2.
[11] C.J Hyde, I.E Robert, A.J Sinclair A, The effects of supporting discharge from hospital to home in older people. Age and Aging (2000) 29.
[12] S. Payne, C. Kerr, S. Hawker et al, The communication of information about older people between health and social care practitioners. Age and Aging (2002) 31.

[13] S.G. Parker, S.M Peet, A. McPherson, A.M Cannaby et al, A systematic review of discharge arrangements for older people. Health Technology Assessment (2002) 6, 4.
[14] J.T Hanlon, C.I Lindblad, S.L Gray, Can clinical pharmacy services have a positive impact on drug-related problems and health outcomes in community-based older adults. The American Journal of Geriatric Pharmacotherapy (2003)2,1.
[15] C.O Phillips, S.M Wright, D.E Kern, et al, Comprehensive Discharge Planning With Postdischarge Support for Older Patients With Congestive Heart Failure. JAMA (2004) 291,11.
[16] P. Mistiaen, A.L Francke, E. Poot, Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systemic meta-review. BMC Health Services Research (2007) 7, 47.
[17] A. Coffey, Discharge older people from hospital to home: what do we know? International Journal of Older People Nursing (2006) 1.
[18] M. Bauer, L. Fitzgerald, E. Haesler, M. Manfrin, Hospital discharge for frail older people and their family. Are we delivering best practice? A review of the evidence. Journal of clinical Nursing (2009)18, 2539-2546.
[19] M. Garcia- Caballos, F. Ramos-Diaz, J.J Jimenez-Moleon, A. Bueno-Cavanillas, Drug- related problems in older people after hospital discharge and interventions to reduce them. Age and Aging (2010) 39, 430-438.
[20] S. Shepperd, J. McClaran, C.O Phillips, et al, Discharge planning from hospital to home (Review). The Cochrane Library (2010) Issue 1.
[21] M.D Naylor, E.T Kurtzman, D.M Olds, K.B Hirschman, The importance of transitional care in achieving health reform. Health Aff (2011) 30, 4: 746-54.
[22] M.D Naylor, D. Brooten, R Campbell, et al, Comprehensive Discharge Planning and Home Follow-up of Hospitalized Elders. JAMA (1999)281, 23.
[23] A.G Caplan, A.J Williams, B. Daly, K. Abraham, A Randomized, Controlled Trial of Comprehensive Geriatric Assessment and Multidisciplinary Intervention After Discharge of elderly from The Emergency Department –The DEED 11 Study. JAGS (2004) 52, 1417-1423.
[24] M.D Naylor, D. Brooten, R.L Campbell, et al, Transitional Care of Older Adults Hospitalized with Heart Failure: A Randomized controlled Trial. JAGS (2004) 52, 5.
[25] C. Anderson, B.V Deepak, Y. Amoateng-Adjepong, S. Zarich, Benefits of Comprehensive inpatient Education and Discharge Planning combined With Outpatient Support in Elderly Patients with Congestive Heart Failure. Congestive Heart Failure (2005) 11, 6: 315-321.
[26] A.J Sinclair, S.P Conroy, M. Davies, A.J Bayer, Post-discharge home-based support for older cardiac patients: a randomized controlled trial. Age and Aging (2005)43,338-343.
[27] E.A Coleman, C. Parry, S. Chalmers, S.J Min, The Care Transitions Intervention. Arch Intern Med (2006) 166,1822-1828.
[28] J.L Schnipper, J.L Kirwin, M.C Cotugno, et al, Role of a pharmacist Counseling in preventing Adverse Drug Events After Hospitalization. Arch Intern Med (2006)166.
[29] P. Midlov, E Deierborg, L. Holmdahl, et al, Clinical outcomes from the use of Medication Report when elderly patients are discharged from hospital. Pharm World Sci (2008a) 30, 840-845.
[30] P. Midlov, L. Holmdahl, T. Eriksson et al, Medication report reduces number of medication errors when elderly patients are discharged from hospital. Pharm World Sci (2008b)30, 92-98.
[31] M. Courtney, H. Edwards, A. Chang et al, Fewer emergency readmissions and better quality of life for older adults at risk for hospital readmission: a randomized controlled trial to determine the effectiveness of a 24-week exercise and telephone follow-up program. J Am Geriatr Soc (2009) 57, 3:395-402.
[32] L. Rytter, H.N Jakobsen, F. Rønholt et al, Comprehensive discharge follow-up in patients` homes by GPs and district nurses of elderly patients. Scandinavian Journal of Primary Health Care (2010) 28,146-153.
[33] M.J Bull, H.E Hansen, C.R Gross, Differences in Family Caregiver Outcomes by Their Level of Involvement in Discharge planning. Applied Nursing Research (2000)13, 2.
[34] M.J Bull and J. Roberts, Components of a proper hospital discharge for elders. Journal of Advanced Nursing (2001) 35, 4:571-581.
[35] K.H Bowles, J.B Foust, M.D Naylor, Hospital Discharge Referral Decision Making: A Multidisciplinary Perspective. Applied Nursing Research (2003) 16, 3:134-143.
[36] R. Hellesø, L. Sorensen, M. Lorensen, Nurse`s information management at patients discharge from hospital to home. International journal of integrated care (2005) 5.
[37] L. Halasyamani, S. Kripalani, E. Coleman, J. Schnipper et al, Transition of care for Hospitalized Elderly Patients – Development of a Discahrge Checklist for Hospitalists. Journal of Hospital Medicine (2007) 1,6.
[38] B. Glintborg, S.E Andersen, K. Dalhoff, Insufficient communication about medication use at the interface between hospital and primary care. Qual Saf Helath Care (2007)16, 34-39.
[39] K. Ouchida, M.V LoFaso, C. F Capello et al, Fast Forward Rounds: An Effective Method for Teaching Medical Students to Transition Patients Safely Across Care Settings. JAGS (2009) 57, 910-917.
[40] S. Bray-Hall, K. Schmidt, E. Aagaard, Towards Safe Hospital Discharge: A transition in care Curriculum for Medical Students. J Gen Intern Med (2010) 25, 8: 878-81.
[41] C. Foss C and D. Høfoss, Elderly persons` experiences of participation in hospital discharge process. Patient Education and Counseling (2010)
[42] K. Ornstein K, K.L Smith, D. H Foer et al, To the Hospital and Back Home Again: A Nurse Practitioner- Based Transtional Care Program for Hospitalized Homebound People. JAGS (2011)59,3.
[43] V. Goodwin and B. Happell, Conflicting agendas between consumers and carers: the perspective of carers and nurses. International Journal of Mental Health Nursing (2006) 53, 646-655.
[44] K. Avlund, E. Jepsen, M. Vass, H. Lundemark, Effects of Comprehensive Follow-up Home Visits after Hospitalization on Functional Ability and readmission among Old Patients. A Randomized Controlled Study. Scandinavian Journal of Occupational Therapy (2002) 9, 17-22.
[45] L.A Blewett, K. Johnson, T. McCarty, Improving geriatric transitional care trough inter-professional care teams. Journal of Evaluation in Clinical Practice (2010) 16, 57-63.
[46] I.M Buchanan and R.W Besdine, A Systematic review of curricular interventions in teaching transitional care to physicians in training and physicians. Academic Medicine (2011) 86, 5.
[47] E.A Coleman, J.D Smith, D. Raha et al, Posthospital medication discrepancies: prevalence and contributing factors. Arsh Intern Med (2005) 165, 1842-7.
[48] K.M Gleason, M.R McDaniel, J. Feinglass et al, Result of the Medications At Transitions and Clinical Handoffs (MATCH) Study: An Analysis of Medication Reconciliation Errors and Risk Factors at Hospital Admission. J Gen Intern Med (2010) 25, 5:441-7.
[49] P.C Walker, S.J Bernstein, J.N Tucker Jones et al, Impact of a pharmacist-Facilitated Hospital Discharge Program. Arch Intern Med (2009) 169, 21.
[50] M. Crotty, D. Rowett, L. Spurling et al, Does the addition of a pharmacist transition coordinator improve evidence-based medication management and health outcomes in older adults moving from the hospital to a long-term care facility? Results from a randomized, controlled trial. Am J Geriatr Pharmacother (2004) 2,4.
[51] D.H Adel Quader, L. Harper, J.A Cantrill, M.P Tully, Pharmacists`s interventions in prescribing errors at hospital discharge. Drug saf (2010) 33, 11.
[52] I. Nazareth, A. Burton, S. Shulman et al, A pharmacy discharge plan for hospitalized elderly patients – a randomized controlled trial. Age and Aging (2001) 30, 33-40.

[53] S. Paparella and H. Pa, Medication Reconciliation: Doing What`s Right for Safe Patient Care. J Emerg Nurs (2006) 32.
[54] M.J Kergoat, J. Latour, I. Julin et al, A discharge summary adapted to the frail elderly to ensure transfer of relevant information from the hospital to community settings: a model. Geriatrics (2010)10,6.
[55] K.J Johnson and P. Barach, Patient care handovers: what will it take to ensure quality and safety during times of transition? MJA (2009) 190, 11.
[56] H. Brown-Williams, L. Neuhauser et al, From hospital to home: Improving transitional care for older adults. Health Research for Action: University of California, Berkley, California (2006)
[57] L.L Popejoy, K. Moylan, C. Galambos, A Review of Discharge Planning Research of Older Adults 1990-2008). Western Journal of Nursing Research (2009) 31, 7.
[58] C. Baker, J. Battles, H. King, et al, The Role of Teamwork in the Professional Education of Physicians: Current Status and Assessment Recommendations. Joint Commission Journal on Quality and Safety (2005) 31,4: 185-202.
[59] K.H Bowles, J.B Foust, M.D Naylor, Hospital Discharge Referral Decisions Making: A Multidisciplinary Perspective. Applied Nursing Research (2003) 16:3.
[60] D. Baker, E. Salas, P. Barach et al, The Relation between Teamwork and Patient Safety. Handbook of Human Factors and Ergonomics in Health Care and Patient Safety, Carayon (Ed.). Lawrence Erlbaum Associates (2006) pp, 259-271.
[61] J. Benbassat and M. Taragin, Hospital readmissions as a measure of quality of health care. Arch Internal medicine (2000) 160:1074-81.
[62] T. Manser and S. Foster, Effective handover communication: An overview of research and improvement efforts. Best Practice & Research Clinical Anaesthesiology (2011) 25:181-191.
[63] E.S Patterson and R.L Wears, Patient Handoffs: Standardized and Reliable Measurement Tools Remain Elusive. Journal on Quality and Patient Safety (2010) 36:2.

Paper III

BMJ open

Quality and safety in transitional care of the elderly: the study protocol of a case study research design (phase 1)

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ABSTRACT

Introduction: Although international studies have documented that patients' transitions between care providers are associated with the risk of adverse events and uncoordinated care, research directed towards the quality and safety of transitional care between primary and secondary health and care services, especially for the elderly receiving care from multiple healthcare providers due to complex health problems, is lacking. This study investigates how different aspects of transitional care can explain the quality and safety of elderly healthcare services in Norway. The overall aim of the study was to explore different aspects of transitional care of the elderly, in different contexts and how they might explain the quality and safety of care.

Methods and analysis: The study applies a case study design. Two cases are chosen: one city-based hospital and one rural hospital with associated nursing homes and home-based nursing services. Admission and discharge to/from hospital to/from nursing homes or home-based nursing services constitute the main focal areas of the study, including the patient, next-of-kin and the professional perspective. The qualitative methods employed include participant observation, individual interviews and document analysis. To ensure trustworthiness in the data analysis, we will apply analyst triangulation and member checks. A total impression of the data material will first be created in a systematic text condensation approach. Second, the qualitative data analysis will involve in-depth analyses of two specific themes: the risk perspective and the patient perspective in transitional care.

Ethics and dissemination: The study is approved by the Norwegian Regional Committees for Medical and Health Research Ethics. The study is based on informed written consent, and informants can withdraw from the study at any point in time. Interview and observation data material will be managed confidentially.

Results: It will be disseminated at research conferences, in peer-reviewed journals and through public presentations to people outside the academic community.

INTRODUCTION

Transitional care has become one of the most pressing topics in the global efforts to improve the quality and safety of patients due to the growing evidence indicating a correlation of patient handovers with medical errors and adverse events. Transitional care in this setting is defined as a set of actions ensuring the coordination and continuity of healthcare as patients transfer among different locations and different levels of care within the same location.[1] The transfer of essential information and the responsibility for the care of the patient from one healthcare provider to another are integral and vital components of quality and safety in healthcare services.

The elderly population with complex health problems typically receives care from numerous healthcare providers and moves frequently within and across healthcare settings. A growing body of evidence suggests that the elderly are particularly vulnerable to experiencing discontinuity in care with the potential for adverse outcomes due to poorly executed transitions.[1–4] Elderly patients, many with reduced mental capacity, are those most dependent on a healthcare system that is able to communicate appropriately and transfer information and duties properly.[5] Frail elderly patients, particularly those with cognitive impairment, consistently suffer repeated hospitalisation, iatrogenic complications and uncoordinated care.[6] A review of the growing body of literature reveals that relatively little data are available to document quality and safety-related issues occurring during the transitions that interface between primary and secondary healthcare services.[7] Thus far, little data have been available to estimate the breaches to quality and safety in the posthospital period.[8] A commendable exception is the recent HANDOVER study, a large multicentre and multinational study on patient transitions from the acute hospital to the primary care setting using a mixed-methods approach involving patients and care providers.[9]

The Coordination Reform, launched in 2009, is the principal healthcare reform implemented in Norway from 1 January 2012. The reform aims to solve three primary challenges in the Norwegian healthcare services: (1) patients' needs for co-ordinated services, (2) increased attention on disease prevention and (3) population development and the changing range of illnesses among the population. The Coordination Reform further accentuates the relevance of the 'Quality and Safety in Transitional Care of the Elderly' study as it implies changes to the contextual setting in which the transitional care of the elderly takes place.

AIMS

The 'Quality and Safety in Transitional Care of the Elderly' study has two main objectives:

1. To explore different aspects of transitional care of the elderly (eg, coordination, multiprofessional collaboration, patient participation) in different contexts (eg, admission or discharge, densely or sparsely populated geographical areas) and how they might explain the quality and safety of care (phase 1).
2. To design and test an evidence-based intervention programme to assess the impact of transitional care on quality and safety and to implement improvements within the transitional care of the elderly (phase 2).

This study protocol covers phase 1 of the project.

Thus far, most studies on transitional care (handovers, handoffs, etc) have employed methods such as individual or focus group interviews with patients and professionals[10–14] and, to a much lesser extent, methods involving the real-time observation of practice when patients cross care provider boundaries. Real-time observational studies have been more common within, for instance, anaesthesia and surgery,[15] where different methods and techniques have been employed in the study of behaviour of, for instance, operating theatre teams. Here, the focus is the professional perspective as the patient plays a passive role, having been anaesthetised. A clinician-centred approach has also been the focus of different observational studies of handovers at hospitals, often with the aim of mapping information dynamics and communication processes.[16 17] As part of the patient-centred care movement, techniques such as patient and family shadowing have been developed within a more practice-based improvement or change perspective.[18] The aim of such efforts is to have an observer follow a patient and family throughout a selected care experience (often in-hospital surgery or trauma care) to view and capture the details of the entire care experience from the point of view of the patient and family.

In the 'Quality and Safety in Transitional Care of the Elderly' study, real-time observations of transitional care practice constitute the main data material (supported by structured interviews and document analyses), combining the professional perspective and the patient perspective by including patients, next of kin and care providers in observational case studies.

METHODS AND ANALYSIS

The 'Quality and Safety in Transitional Care of the Elderly' study (phase 1) employs a case study research design using multiple qualitative methods. Case studies are a preferred design within complex contexts where it is difficult to isolate variables or where strong interactions occur among variables,[19] which is particularly relevant for this study of transitional care involving multiple contexts and variables. Two cases are chosen based on a most dissimilar strategy, where a case consists of one hospital along with its associated nursing homes and home-based nursing services:

- *Case A* consists of a small rural hospital (approximately 2000 employees) and three relatively small rural nursing homes with associated home care services in three municipalities.
- *Case B* consists of a relatively large city-based university hospital (approximately 7000 employees) and three relatively large city-based nursing homes with associated home care services in one municipality.

Both cases are situated in the same Regional Health Authority in Norway.

The aim of the case study research design was fourfold: (1) to explore the phenomenon of transitional care; (2) to become familiar with each case as a stand-alone entity, allowing unique patterns of each case to emerge; (3) to conduct cross-case comparisons, searching for patterns across the cases (similarities and differences) and (4) to contribute to the development of context-specific theories of transitional care and the factors influencing quality and safety in transitional care.

Two types of transitions will be studied in case A and case B, as illustrated in figure 1. The transitions included are the admission of elderly patients to the hospital from the nursing home or home with home-based care services and the discharge of elderly patients from the hospital to the nursing home or home with home-based care services.

The admission transitions included are acute admissions of the elderly from nursing homes or home with home-based care services to the emergency department at the hospital via ambulance or the municipal emergency clinic. The discharge transitions included are the discharge of elderly patients from different hospital departments via ambulance or taxi transport to nursing homes or home with home-based care services.

The overarching research questions guiding the study of transitional care in the two case studies are as follows:

A. How are admission and discharge transitions of the elderly across primary (nursing homes, home-based services, general practitioners) and secondary (hospitals) care providers carried out?
B. How can different aspects of admission and discharge transitions of the elderly (eg, coordination,

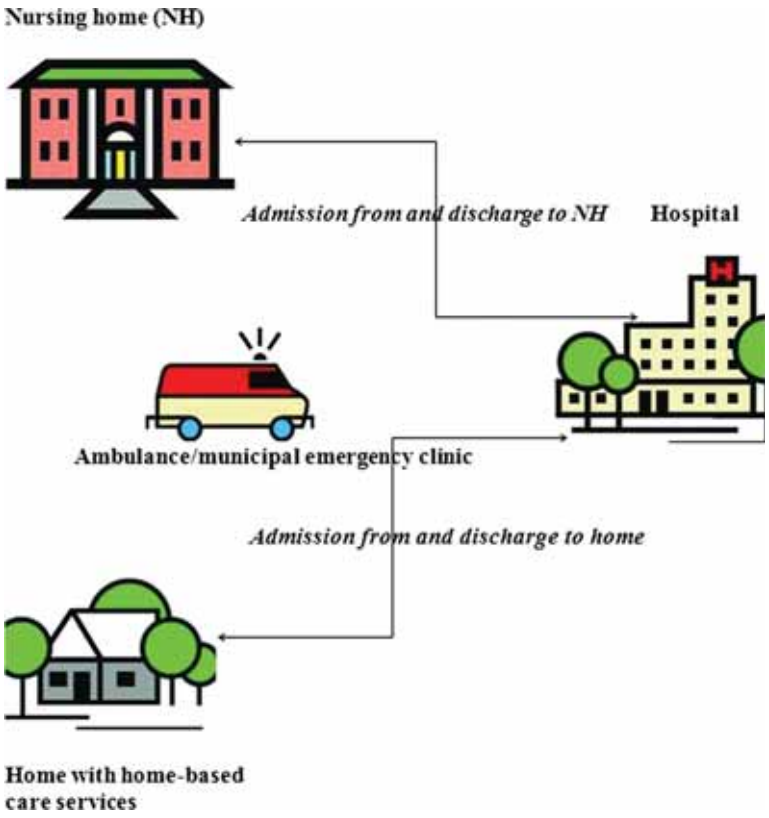

Figure 1 Transitions included in the study.

multiprofessional collaboration, patient participation) explain the quality of transitional care across primary and secondary care providers?

C. What are the risks associated with admission and discharge transitions of the elderly across primary and secondary care providers?
D. How is the patient perspective (patients and next of kin) embedded in admission and discharge transitions of the elderly across primary and secondary care providers?
E. What measures need to be initiated to ensure quality and safety in admission and discharge transitions of the elderly across primary and secondary care providers?

Study sample

The main aim of phase 1 of the 'Quality and Safety in Transitional Care of the Elderly' project is to explore different aspects of transitional care of the elderly in different contexts. Including admission and discharge and employing the most dissimilar case strategy (case A and case B) addresses the issue of different aspects and contexts. Concerning the elderly group, we focus on the frail elderly[i] (>75 years old). Our literature review demonstrated that few studies exist concerning the quality and safety of frail elderly patients.[7]

Within the frail elderly group, we want to include patients with different diagnoses covering orthopaedic and medical conditions. We also want to cover patients with poly-pharmacy (>5 medications), given the knowledge that adverse events in transitional care of the elderly are often associated with medication errors.[7] In Norway, approximately 50% of the elderly (>70 years old) receive prescriptions for more than five medications, and 20% receive them for more than 10 medications.[21] Within orthopaedic conditions, the frail elderly are at high risk of hip fracture (upper femur); in

[i]One of several definitions of the frail elderly is "*A person older than 75 years of age who has been hospitalized three or more times in the last 12 months and has three or more diagnoses in their medical records according to the International Classification of Diseases (ICD-10)*".[20] In this study, we seek to include patients according to such a definition of frail elderly in parts of the study sample.

Norway, 9000 elderly are admitted to hospital with this diagnosis each year.[22]

Hip fracture represents a marker for vulnerability and is often associated with trauma (bleeding, pain, loss of function, increased care need) for the elderly patient.[23] Among the medical conditions, chronic obstructive pulmonary disease (COPD) is a diagnosis that increases among the elderly with a high mortality rate.[24] In Norway, the elderly with COPD have a significantly higher risk (26%) of being readmitted to hospital than with other diagnoses.[25] Other frequent medical conditions for the elderly are stroke, diabetes, malnutrition and infections often occurring in addition to other chronic diseases, resulting in a compound treatment and care picture requiring integrated care.

Dementia is another common condition among the elderly. In Norway, 70 000 elderly individuals were diagnosed with dementia in 2009. The incidence is close to 20% in the 80–84-year-old age group, increasing to approximately 40% for the 90+ age group.[22] A country-wide supervision (Norwegian Board of Health Supervision) of municipal health and social services for the elderly concluded that a lack of continuity exists in the care of the frail elderly with dementia.[22]

Based on the discussion thus far, the patient and next-of-kin inclusion criteria for the study are as follows:

- Elderly patients (>75 years old) receiving healthcare in the municipality (nursing home or home-based care services) with
  - Hip fracture (upper femur) or
  - COPD-related problems (eg, pneumonia, respiratory disorder)
  - Patients with dementia admitted or discharged with one of the two diagnoses (upper femur hip fracture or COPD-related problems)
- Poly-pharmacy (>5 medications)
- Next of kin for the patients meeting the above inclusion criteria.

Inclusion criteria might be adjusted if patient volume is limited. If that is the case, patients older than 70 years with other medical conditions (eg, stroke, diabetes, malnutrition, infections) than upper femur fracture and COPD-related problems will also be included. Poly-pharmacy and variation across orthopaedic and medical patients will be sought.

The main criterion for inclusion of healthcare personnel in the study has been their relation to the transitional care of the included patient group, as previously described. Healthcare personnel involved in admission or discharge, in community-based care (nursing homes or home-based services) or hospital services to be included in the study sample, include the following professional groups in case A and case B: (1) paramedics, (2) doctors at hospital, (3) doctors employed at nursing homes, (4) general practitioners, (5) nurses at hospital, (6) nurses in municipalities (nursing homes, home-based services), (7) physiotherapists at hospital, (8) physiotherapists in municipalities and (9) community-based patient coordinators. Variation in gender and experience among healthcare personnel will be sought.

Data collection

The study employs a triangulation of qualitative methods;[26] participant observation constitutes the main part, supported by document analysis and followed by structured interviews. Table 1 displays the different qualitative methods employed in the study together with expected data materials in case A and case B.

Data collection will be standardised across the two case study sites using an agreed observation guide and

Table 1 Data collection methods and material

Methods	Case A (rural)	Case B (city)
Participant observation (including open-ended, interactive conversations with patients, next of kin, staff)	*Admission*: 8–10 patient cases (mix of orthopaedic and medical, 2–5 h of observation per case) *Discharge*: 8–10 patient cases (mix of orthopaedic and medical, 5–10 h* of observation per case)	*Admission*: 12–15 patient cases (mix of orthopaedic and medical, 2–5 h of observation per case) *Discharge*: 12–15 patient cases (mix of orthopaedic and medical, 5–10 h* of observation per case)
Individual interviews with staff	*Admission*: 12–15 (ambulance workers, ER nurses, ER doctors) *Discharge*: 20–30 (hospital doctors, general practitioners, nursing home doctors, hospital nurses, nursing home nurses, home-based care nurses, hospital physicians, community-based physicians, community-based patient coordinators)	*Admission*: 12–15 (ambulance workers, ER nurses, ER doctors) *Discharge*: 20–30 (hospital doctors, general practitioners, nursing home doctors, hospital nurses, nursing home nurses, home-based care nurses, hospital physicians, community-based physicians, community-based patient coordinators)
Document analysis	*Admission*: admission summaries, medication lists *Discharge*: discharge summaries, medication lists, follow-up care notes	*Admission*: admission summaries, medication lists *Discharge*: discharge summaries, medication lists, follow-up care notes

*If practically possible, some of the observations will include data collection (patient and personnel conversations, number of transitions) related to follow-up care (30 days).

interview guide. One researcher (DND) will conduct observations and interviews related to admission in case A and case B while another researcher (KAL) will conduct observations and interviews related to discharge in case A and case B. The two researchers will conduct data collection simultaneously at the two case study sites and will meet regularly to discuss first impressions, review data collection tools and methods, and conduct possible follow-ups of data. The three data collection methods are described in more detail in the following sections.

Participant observation

Participant observation[27] will be carried out related to admission and discharge transitions according to an agreed-upon observation guide based on several literature reviews.[7 28 29] Themes in the observation guide include: (1) structures/plans, (2) coordination with other care providers, (3) conversation/coordination with patient and next of kin, (4) interdisciplinary collaboration, (5) documentation/information, (6) time factors, stress, other elements and (7) results. In addition, demographic data related to patients (age/gender, diagnosis, medications) and personnel (age/gender, position, work experience) will be noted. No tape-recording will be used during the observations due to the complexity of personnel, patient and next of kin involved. Observation summaries will be written consecutively. Observations include short conversations with all personnel involved in the transition and with the patients and next of kin.

Observation of admissions will start with the handover from the ambulance personnel to the nurses in the emergency room and end with a structured conversation with the patient at the ward 1 or 2 days after hospital admittance. The researcher will observe the interaction, coordination and dialogue (written in the forms of information and documentation developed and transferred and oral in the forms of communication) among the healthcare personnel (eg, paramedics, nurses, doctors), patient and next of kin. Copies of admission summaries and medication lists will be made during the participant observations. The observations on the day of admittance will conclude with short conversations with healthcare personnel asking them to clarify aspects of the current admission and evaluate the quality of the admission process.

Observations of discharges will start on the morning of the day of discharge (with the doctor's round) and end with structured conversations with the patient and involved personnel at the nursing home or in the home-based care services from 1 or 2 days after discharge and up to 30 days after discharge. The researcher will observe the interaction, coordination and dialogue (written and oral) among the healthcare personnel (eg, nurses, doctors, physiotherapists), patient and next of kin on the day of discharge. Copies of discharge summaries and medication lists will be made during the participant observation. The researcher will, if possible, observe the patient on arrival at the nursing home or home with home-based care services and conduct a follow-up observation 1 or 2 days after discharge. During the follow-up observation, copies of written documentation related to follow-up care (care plans, medical cards, doctors' and nurses' notes) will be made, if available. During discharge observations, short conversations with nurses and physicians at hospital and in primary care will be conducted to clarify aspects of the current discharge and evaluate the quality of the discharge process. If possible, some of the patients will be observed up to 30 days after discharge to map follow-up care, readmissions and transitions between short-term and long-term rehabilitation institutions. The follow-up observations will include mapping of where the patients stay during the 30-day period, the care providers involved and short conversations with the patients, next of kin and personnel (face to face or via the phone).

Individual interviews

As part of the participant observations, short-ended and open-ended individual interviews will be conducted with the observed patients and next of kin 1 or 2 days after admission to and discharge from hospital. The interviews will be in the form of unstructured and interactive conversations with the aim of capturing interviewees' experiences of transitional care, as well as perspectives and stories related to the observed admission or discharge process. Themes to be covered in the patient and next-of-kin conversations include (1) transition process, (2) preparation/preparedness, (3) involvement/participation, (4) information, (5) interdisciplinary collaboration, (6) satisfaction, (7) incidents and (8) improvements. During observations of discharge transitions, several conversations might take place during the period of up to 30 days of follow-up care.

After finishing the participant observation data collection, structured interviews will be conducted with personnel in primary and secondary healthcare services involved in admissions and discharge processes following an agreed-upon interview guide. Themes to be covered in the personnel interviews include (1) coordination/interaction among care providers (experiences, success, insufficiency, improvements), (2) multidisciplinary collaboration, (3) information exchange, (4) knowledge sharing, (5) quality and safety, (6) patient and family involvement/education, (7) structure/planning and (8) challenges/barriers. The structured interviews will build on the participant observations as the same researcher will conduct the observations and interviews. Although no detailed analysis of observational data will exist at the time of the structured interviews, the researcher will have conducted a rough 'first impression' analysis based on observational notes and summaries, giving her the possibility to pick up on important issues after being in the field of transitional care. This approach will provide her with an important contextual

understanding that will enable her to give the structured interviews more depth and examples on which to build the conversation. The structured interviews of personnel in case A and case B will build on a saturation principle,[27] meaning that the number of interviews will be adjusted according to the amount of accumulative information they bring.

Document analysis

Admission and discharge summaries, medication lists and written documentation related to admission and follow-up care will be copied during the participant observations at hospitals, nursing homes and home-based nursing care settings. The documentation will act as important data material to be used in follow-up conversations and interviews related to each of the observed patients and in general to evaluate the quality of written documentation.

Registered adverse events related to coordination issues (mandatory field in the registration system) will be analysed for the 2008–2012 period according to frequency. A selection of events will be analysed in detail according to types, causes and topics. The documented events will be used to inform research question C and a detailed analysis of the risks involved in transitional care in case A and case B.

Data analysis

To ensure trustworthiness in the analysis, we will apply analyst triangulation and member checks.[30 31] Our research team will discuss and refine the analysis according to our research questions and themes emerging in the data. All transcribed observations and interviews will be uploaded and systematised using Nvivo.

A 'big picture' or total impression of the data material will first be created using Malterud's step 1 in a systematic text condensation approach.[32 33] This will involve the entire research team and an external researcher not involved in the design of the study. Researchers in the research team will individually read the data material and discuss the overall emerging themes. After agreeing on a set of themes, the research team will meet with the external researcher who has individually created his/her overall themes to discuss and agree on a common set of themes to be included in the 'big picture'. It is this total impression that will form the basis for the development of phase 2 of the 'Quality and Safety in Transitional Care of the Elderly', the evidence-based intervention programme, and that will inform research questions A, B and E.

Step 2 of the qualitative data analysis will involve in-depth analyses of two specific themes. This will involve the risk perspective in transitional care (research question C), carried out by KAL as the principal analyst, and the patient perspective in transitional care (research question D), carried out by DND as the principal analyst. These analyses will involve creating subthemes, categories and meaning units[32] as well as applying different theoretical perspectives (patient participation, risk/resilience) to the data material and including researcher triangulation with the rest of the research team.

After analysing the data from observations, interviews and documents, member checks[30 31] will be conducted in two focus groups (one hospital based and one community based) and in one workshop (common for hospital-based and community-based services) to validate the research findings and involve the participants in possible intervention measures (phase 2) in each of the two cases (a total of four focus groups and two workshops). All participants in phase 1 of the 'Quality and Safety in Transitional Care of the Elderly' study will be invited to attend the workshops. The focus groups will consist of five to seven participants included in the study covering admission and discharge at the hospital and nursing homes and home-based care services in the municipalities.

Ethical concerns and dissemination

The study has been approved by the Norwegian Regional Committees for Medical and Health Research Ethics (REC, no. 2011/1978).

The study is based on informed written consent, and informants can withdraw from the study at any point in time. Interview and observation data material will be managed confidentially (indirect person identifiable). Tape recordings will be deleted immediately after transcription. Each transcribed interview and observation will be marked with a code, and the list matching the person identification and code will be securely stored (locked cabinet or password-protected PC at the university) by the research group (principal researcher). Transcribed data material will be stored at the research institution for 3 years after the project ends. Paper copies of admission and discharge summaries, medication lists and written documentation related to follow-up care (if available) will be made, deleting direct person-identifiable information and any information not relevant for this study. Thus, superfluous information (eg, previous medical conditions) will not be included. Copies will be made and signed by the responsible nurse, checking that all direct person-identifiable information and access information are deleted. The copies of patient-related summaries will be stored in a locked cabinet at the research institution.

Results are to be disseminated at several congresses and research conferences and in articles published in peer-reviewed journals. In addition, we are going to present study results to people outside the academic community through public presentations.

DISCUSSION

Real-time observation of transitions involving patients crossing care provider and care-level boundaries is a complex endeavour. It involves data collection in

multiple locations, with multiple professions, patients and next of kin. Transitional care is furthermore a complex phenomenon involving a substantial set of dimensions or factors (eg, patient involvement, coordination, multiprofessional collaboration, documentation, information or communication) to be explored and mapped. As a whole, this complexity forces fierce prioritisations on the design of a study of transitional care of the elderly. In this study, prioritisations have been taken along the axes of the patient groups included (hip fracture and COPD, with or without dementia), the cases included (one rural and one city based) and the researchers included (single researchers on admission and discharge, respectively, but with analyst triangulation).

The main contribution of the study will be contextual knowledge created by real-time observations of transitional care practices of the elderly crossing care provider boundaries. This adds to the existing literature primarily concerned with individual and focus group interviews with professionals and/or patients.

Undoubtedly, several limitations exist in terms of the design of the 'Quality and safety in Transitional Care of the Elderly' project due to the complexity of the scope and aims of the study. Most of the limitations are caused by practical and resource-based constraints and obstacles. One of the limitations concerns data collection at admission, where observation start is set in the emergency room at the handover from the ambulance personnel to the ER nurse. Ideally, data collection on admission transitions from primary care to secondary care would benefit from starting at the nursing home or home with home-based care services and following the patient on the day of admission. This has not been possible to incorporate into the current project due to the size of the study and practical problems with recruiting these patients and their care providers.

In addition, it would have been valuable for the study to acquire data on the entire elderly patient pathway, from the day of admission through hospital stay (with belonging transitions) through discharge and 30-day follow-up care. As the 'Quality and Safety in Transitional Care of the Elderly' study is designed, data from hospital stay are restricted to the number of days hospitalised. Another limitation relates to the challenges of data collection in case A (rural). Owing to its rural location, practical and resource-based issues (eg, travel costs for researchers) will create obstacles for the depth and length of data collection activities. In particular, this will influence the possibility to do follow-up observations up to 30 days after discharge.

Finally, a note on the possible observer bias is worth mentioning as we have chosen to conduct the observations with single researchers (both having a nursing background), doing the observations and interviews in admission and discharge transitions. Ideally, an observation team with a minimum of two researchers with different backgrounds could better cover the complexity of the observation setting involving the professional as well as the patient perspectives. We tried to control the observer bias by setting up the observations of admission and discharge at the same point in time so that the regular exchange of fieldwork impressions between the two researchers could take place. In one or two observations, we will include an additional researcher from the research team to validate the observation summaries. In addition, we have set up weekly meetings or updates in the observational periods with the entire research team (backgrounds within nursing, management, and quality and safety) to debrief and discuss preliminary impressions. Regular discussions among the research group and a wider international advisory board will also provide opportunities for reflexivity and the development of insights into fieldwork and data analysis.

Despite the limitations of the study design, we argue that the uniqueness of our study design applied to explore different aspects of transitional care is considerable. Thus far, a limited number of studies have applied participant observation in order to grasp the context and complexity surrounding transitional care. The use of the triangulation of methods to increase the credibility of the research findings[26] and the focus on the frail elderly identified as a particularly vulnerable group in transitional care[34] represent other novel aspects of this study. The application of professional-centred and patient-centred perspectives will generate new and increased understanding within the field of transitional care of the elderly. The study results will furthermore be used to guide the design of an intervention programme with specific measures to be implemented to ensure quality and safety in the transitional care of the elderly across primary and secondary care (phase 2).

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Contributors KA developed the original proposal for grant application, planned the study design and the study protocol, contributed to the development of data collection tools and drafted and revised this manuscript. KAL contributed to the study design, was responsible for the development of data collection tools and ethical approval, and contributed to the drafting and revision of the manuscript. DND contributed to the development of data collection tools and commented on the study protocol and manuscript draft and revision. MS commented on the study protocol and data collection tools, and contributed to the manuscript draft and revision. All authors read and approved the final manuscript.

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REFERENCES

1. Coleman EA, Boult C. Improving the quality of transitional care for persons with complex care needs. *J Am Geriatr Soc* 2003;51:556–7.
2. Coleman EA. Falling through the cracks: challenges and opportunities for improving transitional care for persons with complex care needs. *J Am Geriatr Soc* 2003;51:549–55.
3. Tsilimingras D, Rosen AK, Berlowitz DR. Patient safety in geriatrics: a call for action. *J Gerontol* 2003;58:813–19.
4. Naylor M, Keating SA. Transitional care. *Am J Nurs* 2008;108:58–63.
5. Garaasen H, Johnsen R. The quality of communication about older patients between hospital physicians and general practitioners: a panel study assessment. *BMC Health Serv Res* 2007;7:133.
6. LaMantia MA, Scheunemann LP, Viera A, *et al*. Interventions to improve transitional care between nursing homes and hospitals: a systematic review. *JAGS* 2010;58:777–82.
7. Laugaland KA, Aase K, Barach P. Addressing risk factors for transitional care of the elderly—literature review. In: Albolino, Bagnara, Bellandi, Llaneza, Rosal, Tartaglia, eds. *Healthcare systems ergonomics and patient safety*. London: Taylor & Francis Group, 2011:161–2.
8. Tsilimingras D, Bates DW. Addressing post-discharge adverse events: a neglected area. *Jt Comm J Qual Patient Saf* 2008;34:85–97.
9. Johnson J, Barach P, Vernooij-Dassen M. Conducting a mulitcentre and multinational qualitative study on patient transitions. *BMJ Qual Saf* 2012;21(Suppl 1):i22–8.
10. Hesselink G, Flink M, Olsson M, *et al*. Are patients discharged with care? A qualitative study of perceptions and experiences of patients, family members and care providers. *BMJ Qual Saf* 2012;21(Suppl 1):i39–49.
11. Flink M, Ohlen G, Hansagi H, *et al*. Beliefs and experiences can influence patient participation in handover between primary and secondary care—a qualitative study of patient perspectives. *BMJ Qual Saf* 2012;21(Suppl 1):i76–83.
12. Flink M, Hesselink G, Pijnenborg L, *et al*. The key actor: a qualitative study of patient participation in the handover process in Europe. *BMJ Qual Saf* 2012;21(Suppl 1):i89–96.
13. Groene RO, Orrego C, Sunol R, *et al*. "It's like two worlds apart": an analysis of vulnerable patient handover practices at discharge from hospital. *BMJ Qual Saf* 2012;21(Suppl 1):i67–75.
14. Siemsen IMD, Madsen MD, Pedersen LF, *et al*. Factors that impact on the safety of patient handovers: an interview study. *Scand J Public Health* 2012;40:439–48.
15. Flin R, Mitchell L,. eds. *Safer surgery. Analysing behaviour in the operating theatre*. Ashgate: Surrey, 2009.
16. Abraham J, Kannampallil TG, Patle VL. Bridging gaps in handoffs: a continuity of care based approach. *J Biomed Informatics* 2012;45:240–54.
17. Lyhne S, Georiou A, Marks A, *et al*. Towards an understanding of the information dunamics of the handover process in aged in care settings—a prerequisite for the safe and effective use of ICT. *Int J Med Informatics* 2012;8:452–60.
18. DiGioia A, Greenhouse KP. Patient and family shadowing. *JONA* 2011;41:23–8.
19. Yin RK. *Case study research: design and methods*. 3rd edn. Applied social research methods series. Thousand Oaks: SAGE Publication, 2003.
20. Gurner U, Thorslund M. Holistic perspective is needed in care of multiimpaired elderly. A proposal for structural change of the organization of care in the county of Stockholm. *Läkartidningen* 2001;98:2596–602.
21. *The Norwegian Prescription Database 2004–2008 Medication Statistics 2009:2*. Oslo: Norwegian Institute of Public Health, 2009. http://www.fhi.no/dokumenter/197a20d501.pdf (accessed 22 Dec 2012).
22. Norwegian Board of health Supervision. *Complex tasks and services require stronger governance. Summary report of countrywide supervision in 2010 of municipal health and social services for elderly people*. Report no. 5/2011.
23. Nickelsen T. *Venter for lenge på operasjon: Eldre med hoftebrudd får delirium*. Norway: Research Magazine Apollon, University of Oslo, 2010. http://www.apollon.uio.no/artikler/2010/delirium.html (accessed 22 Dec 2012).
24. World Health Statistics (2008).
25. Lindman AS, Damgaard K, Tjomsland O, *et al. Re-admissions of elderly in Norway*. Oslo: The Norwegian Knowledge Centre for the Health Services (NOKC), 2012.
26. Lincoln YS, Guba EG. *Naturalistic inquiry*. London: Sage Publication, 1985.
27. Polit DF, Beck CT. *Nursing research: generating and assessing evidence for nursing practice*. 8th edn. Philadelphia, PA: Wolters Kluwer/Lippincott/Williams & Wilkins, 2008.
28. Laugaland KA, Aase K, Barach P. Interventions to improve patient safety in transitional care—a review of the evidence. *Work* 2012;41:2915–24.
29. Dyrstad DN, Testad I, Aase K, *et al. A systematic review of the literature on patient participation in transitions of the elderly*. Cognition: Technology & Work, 2013, Special Issue. In press.
30. Lincoln YS, Guba EG. *Naturalistic inquiry*. Beverly Hills, CA: Sage, 1985.
31. Seale C. *The quality of qualitative research*. London: Sage, 1999.
32. Malterud K. *Kvalitative metoder i medisinsk forskning*. Universitetsforlaget, 2003.
33. Malterud K. Systematic text condensation: a strategy for qualitative analysis. *Scand J Public Health* 2012;40:795–805.
34. Coleman EA, Min SJ, Chomiak A, *et al*. Posthospital transitions: patterns, complications, and risk identification. *Health Serv Res* 2004;39:1449–65.

Quality and safety in transitional care of the elderly: the study protocol of a case study research design (phase 1)

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Hospital discharge of the elderly-an observational case study of functions, variability and performance-shaping factors

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Abstract

Background: Understanding and improving hospital discharge has assumed major importance since it represents an error-prone transition in care. One barrier to improvement is the lack of detailed understanding of how hospital discharge is organized, including its interdependencies and influential performance-shaping factors (PSFs). This study examines the discharge of elderly patients using the Functional Resonance Analysis Method, developed to analyze performance variability in complex systems. Our main aim was to identify hospital discharge functions, variability, and PSFs that may explain the variability and different outcomes in discharge practices by incorporating multiple-stakeholder perceptions (health-care providers, patients, next of kin).

Methods: The data consisted of moderate participant observations of 20 elderly patients (>75) discharged from hospital to primary health care. The data comprised 90 hours' observations at hospital wards, including 173 conversations with patients, next of kin, and health-care personnel involved in discharge.

Results: We identified 10 common functions in the discharge of elderly patients to primary health care. We found substantial variability in terms of *timing*, *duration*, and *precision*. Duration is a significant source of variability, primarily determined by the time of day the patient was determined medically fit for discharge. Precision issues related to (1) decision-making criteria concerning the medical fitness decision and appropriate level of care, (2) quality of discharge planning, (3) degree of patient involvement, and (4) quality of information transfer. PSFs were temporal conditions (degree of time pressure), individual and team characteristics, patient factors, organizational factors (unit, specialization, leadership, institutionalized routines), work environment factors (bed availability, availability in municipal services, quality of discharge planning, familiarity with the patient, pressure from next of kin, doctor's specialization) and regulatory influences (financial incentives).

Conclusions: The study provides a detailed understanding of the discharge of elderly patients by describing common functions and variability in performance caused by multiple PSFs. Our findings indicate the necessity for studying multiple factors related to discharge, interdependencies, and their effects on a range of discharge outcomes incorporating a multiple-stakeholder perspective. We argue that the existing sequential approaches to the complexity surrounding hospital discharge are inadequate. Given the interdependencies among functions, there is a need for corresponding multi-factorial interventions.

Keywords: Hospital discharge, Elderly, Functions, Variability, Performance-shaping factors

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Background

Understanding and improving the process of hospital discharge has assumed major importance [1] since it represents an error-prone transition in care [2]. Elderly patients are notably at risk for adverse events in general and with transitions across health-care providers in particular [3-5]. In this regard, ineffective care processes, poor communication, and deficient documentation have been identified as major contributing factors [1,6]. Despite efforts to improve hospital discharge, current evidence is scant and inconclusive, and progress toward improvement has been limited and slow [7].

Mainstream patient safety research has tended to be reactive: it investigates adverse events to identify cause-and-effect relationships, from which improvements can be formulated [8]. We argue that the existing, sequential approaches to the complexity of hospital discharge are inadequate. A barrier to improvement is the lack of detailed understanding as to how the process of hospital discharge is organized, including its interdependencies and contextual factors [7,9,10]. Little consideration has thus far been afforded to the inherent variability in everyday practice and how this can prospectively create system vulnerabilities [11]. Knowledge about performance variability has not commonly been recognized as an asset, and it has rarely been gathered in a systematic fashion [12].

In the health-care context, the wide variety in patients, their relatives, geographic settings, professional groups, and working conditions means that continuous adaptations are essential toward ensuring overall performance [13]. Variability thus represents a normal, necessary part of clinical work, and it demands the ability to cope with unpredictable, unstable working environments [14]. However, performance variability and the factors that influence hospital discharge practices and outcomes are for the most part poorly understood and have not been fully investigated.

This paper applies an integrated approach to the study of hospital discharge, focusing on functions, interdependencies, and performance-shaping factors from a multiple-stakeholder perspective. Qualitative observational case studies of the hospital discharge of elderly patients are used to identify functions and demonstrate the performance variability that surrounds hospital discharge practices by applying the Functional Resonance Analysis Method (FRAM). The FRAM is an innovative method that is developed to analyze performance variability in complex systems [14]. Specifically, the main aims of the paper are to identify;

- The functions of hospital discharge;
- The areas of variations within those functions, and;
- The performance shaping factors (PSFs) that may explain those variations.

To accomplish these aims we gather and incorporate the perceptions of not just healthcare providers, but patients and their next of kin.

Before introducing the case study and findings, we describe the characteristics and practical approach of the FRAM. We explain how it was used analytically to determine the details of elderly patient discharges in a Norwegian setting.

Functional resonance analysis method

The FRAM is a systemic, non-linear approach that defines complex systems in terms of both their overall and constituent functions. "Functions" here refers to the activities or sets of activities that are necessary to produce a particular outcome, e.g., hospital discharge of the elderly. The aim is to identify and assess the interdependencies among functions within complex systems. In practice, this involves a description of what individuals or groups do to achieve their functional aim—as opposed to analyzing prescribed models of behaviors, e.g., standard operating procedures or care pathways [14]. The FRAM clarifies outcomes in terms of how functions become connected, how everyday performance variability may result from the way individual functions are completed, and how these functions affect one another. In this regard, a system is a set of coupled or mutually dependent functions [14].

In practical terms, the FRAM consists of a five-step approach [14]. The first step involves deciding the purpose of the FRAM analysis, i.e., the clinical work under examination. The second step is identifying the functions that are necessary for that work to be accomplished (as defined by the participants involved in the activity) as well as describing each function in terms of six basic aspects (output, input, precondition, resource, control, and time), as illustrated in Figure 1. The third step involves identification and description of variability in the identified functions in addition to a consideration of the manner and reason for their variation. The fourth step is that of determining how variability within one function affects other functions and how such effects spread across the system in the manner of functional resonance. The final step is to propose ways of managing or diminishing the possible occurrence of uncontrolled performance variability.

The five-step approach of the FRAM can serve a number of purposes. The aim in the present study was to use the method to gain a detailed understanding of the functioning of hospital discharge among elderly patients. This paper thus applies the first three steps of the FRAM—identifying essential discharge functions, variability, and PSFs—which may account for variability and different outcomes across discharge practices.

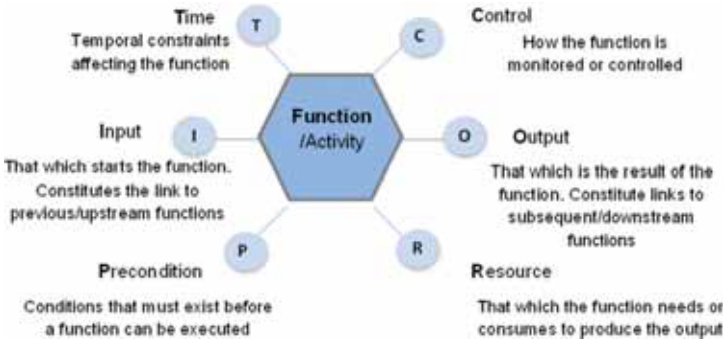

Figure 1 Describing a function by six aspects [11]:p.46.

An important consideration with the FRAM is determining the basis or categorization of successful functioning. With the FRAM, it is proposed that this categorization be developed based on a mutual understanding among a team of experts consisting of the people performing the functions under consideration [14]. However, given the broad range of stakeholders involved in hospital discharge, e.g., various health-care providers in different hospitals and primary-care units, patients, and their next of kin, this approach appears to be inadequate. We therefore define the concept of successful discharge functioning in terms of the perception of the stakeholders.

Methods

Study design and method

The observational case study approach of the present investigation was appropriate for examining local systems and organizational processes [15]. The use of observational research in conjunction with ethnographic research methods allows for a close analysis of naturally occurring social processes and practices within a given organizational context [16]. It offers the possibility of in-depth analysis within particular cases and theoretical generalizations among different cases. It can also allow a study of patterns of hospital discharge practices with different patients, thereby enabling the identification of functions, variability, and components affecting performance and outcome.

Setting

The Norwegian health-care system comprises two organizational structures: primary care (general practitioner, nursing home, and home care); and specialized secondary care. Primary care is managed by local municipalities, whereas specialized health care is provided in state-owned hospitals and operated by four regional health authorities. The Coordination Reform [17] was implemented in January 2012. One of the main focal areas of the reform is to stimulate a good patient flow between hospitals and primary care institutions and to overcome challenges with delayed discharge better known as "bed blocking" (i.e., patient blocking beds in specialist care while awaiting municipal services) [18]. Several measures have been initiated to accomplish this goal, including legislation, mandatory agreements on cooperation between hospitals and municipalities, offering guidance, and providing financial incentives. The most important types of financial support are municipal cofinancing of specialist health-care services and municipal financial responsibility for patients who are ready to be discharged. Specifically, payment (fee of 533 euros per day) to an acute provider unit is required if the municipality does not accept the patient before midnight on the day they are deemed ready for discharge. Under the terms of the Coordination reform, hospital and municipalities are obliged to enter into legally binding contracts that set out formal requirements for care transitions and discharge planning [17].

Sample and selection

The research was conducted in two hospitals in Norway (one rural and one city-based hospital) situated within the same regional health authority. The observations took place in three types of wards (geriatric, medical, and orthopedic) with the intention of developing cross-case comparisons of activity patterns across settings and among different patient groups. Seven wards were included in the study: one geriatric, three orthopedic, and three medical wards. In those seven wards, we selected 20 elderly patients (>75 years old) with orthopedic and medical conditions who would be in need of municipal services

after discharge, e.g., rehabilitation, nursing home care, and home health care. To provide a comprehensive insight into hospital discharge practices, we sought to sample across the broad range of stakeholders involved in the process, i.e., health-care personnel groups, patients, and their next of kin. The broad inclusion criteria applied in this study (different hospitals, wards, patient groups, stakeholder perspectives) was intended to maximize data variation [19]. Table 1 presents the distribution of ward types, hospital types, and numbers of patients.

Data collection

We investigated the discharge of the 20 elderly patients; in line with the requirements of the FRAM approach, using moderate participant observations [20]. Moderate participant observation entails that the researcher be present and identifiable, though not an active participant (i.e., does not have a role in the social setting); the researcher observes and interacts occasionally. This type of participant observation allows the researcher to obtain a high level of involvement while maintaining a level of detachment [20].

The data were collected from March to October 2012. The data consisted of 90 hours of observation, including 173 conversations with patients, their next of kin, and health-care providers involved in the discharge processes. The first author (nursing background) conducted the observations based on a semi-structured observation guide, which is in accordance with the FRAM approach. The guide included topics that are relevant to hospital discharge, e.g., coordination, multi-disciplinary approach, information exchange, patient and family involvement, discharge planning, and challenges or barriers. In addition, the guide allowed for issues to emerge from the observations. In this way, it was intended to provide a detailed description of how discharge works. Observations started in the morning of the day of expected discharge, and they focused on interaction, coordination, and dialogue among health-care personnel and patients. During the observations, the researcher was dressed in hospital clothing so as to be inconspicuous [21].

Table 1 Distribution of patients in hospitals and wards

Hospital (rural)	**Patients**	**Hours of observation**
Orthopedic ward	2	10 h
Medical ward*	4	20 h
Hospital (city)	**Patients**	**Hours of observation**
Orthopedic ward 1	2	11 h
Orthopedic ward 2	3	13 h
Specialized medical ward 1 (pulmonary diseases)	3	12 h
Specialized medical ward 2 (kidney diseases and infections)	2	9 h
Geriatric ward	4	15 h

*There was no specialized geriatric ward at the rural hospital.

Conversations with health-care personnel and patients were carried out in situ to clarify work practices and obtain assessments and viewpoints regarding the current discharge process [20]. The purpose of the conversations was also to stimulate dialogue about impressions and interpretations. Conversations with next of kin were conducted via telephone after discharge. Patients and next of kin were asked to describe their experiences of the discharge process. These conversations followed a particular structure. Besides being requested to relate experiences connected with the overall discharge process, stakeholders were asked about their satisfaction, involvement, participation, and concerns as well as information exchange, discharge planning, and possible improvements.

Copies of discharge summaries (with person-identifiable information deleted) were collected so that community-based health-care personnel could be asked to assess the written documentation and evaluate the overall quality of the current discharge process. No recording was made of the conversations owing to ethical considerations (confidentiality issues) and to the fact that numerous health-care providers, patients, and next of kin were involved (sound recording issues). Observation notes were written during the observations, and a summary of each, including researcher reflections opinions, was written immediately afterward.

Data analysis

In line with the FRAM, data analysis involved a two-stage process: first, we identified common functions in the discharge process; second, we determined variability and PSFs within those functions. We identified common functions through an iterative process. All observational materials (150 written pages of field note summaries) were thoroughly reviewed individually by the first and second authors and then within a team of four researchers involved in the project (an experienced team with backgrounds in nursing, safety, user involvement, and change management). The functions were revised several times until final consensus was reached. A detailed description of the functions (including associated aspects—time, control, input, output, resources, and preconditions) was then developed based on an aggregated analysis of the 20 patient discharge cases, including the conversations with health-care personnel, patients, and their next of kin. Legally binding contracts (i.e., requirements for organizing hospital discharge) for the hospitals and municipalities included in this study were also used to support the description of functions.

The aggregated description of the functions and associated aspects was used for the analysis of variability and PSFs. The variability of each singular function was examined based on the descriptors from the various cases as well as the conversations with health-care personnel, patients, and relatives. Three analytic themes emerged through this process, which characterized the functional variability among the 20 patients: timing, duration, and precision in performance. PSFs were elaborated in the final step of the analysis using the aggregated description of the functions and associated aspects compared across the patient cases. The appropriate level of analysis at which to operationalize variety in organizational work processes has been questioned [22]. In the present study, PSFs were analyzed by applying a multilevel approach based on a stratification similar to Moray's organizing framework of sociotechnical systems [23]. This entails that the analysis of PSFs involved the individual and team level as well as the organizational and contextual factors that were observed and expressed as being important. In the Results section, the main sources of variability among the patients are examined on an aggregated level, with the focus on general patterns.

Ethical considerations

Ethical approval was obtained from the Committee for Medical and Health Ethics of Norway (REC, no. 2011/1978). This study was based on informed, voluntary consent among the patients, their next of kin, and health-care personnel. Ethical issues related to consent capacity were taken into consideration during the recruitment process. Recruitment during hospitalization may be ethically challenging owing to the ability of elderly patients to provide informed consent as a result of functional decline, strain, and cognitive impairments. The health-care providers at the hospitals assessed the cognitive functioning and overall situation of the patients and judged them as being suitable for recruitment. The researchers did not contact patients before they had provided their verbal consent to be contacted and informed about the study. Next of kin were included only if the patient approved of such contact. Next of kin were contacted by phone and informed about the study. The paper follows the STROBE guidelines for reporting of observational studies. An additional file shows the completed STROBE checklist [see Additional file 1].

Results

Hospital discharge functions

Hospital discharge takes place on a day-to-day basis, and involves complex, interdependent functions that require interaction and coordination among a multidisciplinary team of stakeholders, i.e., doctors, nurses, receiving health-care providers, patients, next of kin, and patient coordinators. This study identified 10 common functions that constitute the daily routine for discharging elderly patients from the hospital to primary health-care services in the municipality. The set of functions represent essential activities necessary for hospital discharge to succeed. The set of functions involve;

- Review of hospital inpatients—classifying patients that are medically fit for discharge
- Notifying the municipality that the patient is medically fit
- Informing the patient that they are ready for discharge
- Assigning an appropriate post-discharge site of care and notifying the hospital
- Notifying and informing the patient's next of kin (if any)
- Preparing a nursing discharge record
- Preparing a medical discharge letter
- Providing oral information about the transfer to post-discharge care providers
- Ordering transportation
- Transferring the patient to the post-discharge site of care and ensuring the transfer of written information

A brief description of the identified functions, including a description of the essential associated aspects, is presented in Table 2.

The functional descriptions provided in Table 2 demonstrate that hospital discharge is a complex multi-agency care process, which is composed of multi-functional activities aimed at accomplishing many goals. Those goals include making appropriate care decisions, assigning an appropriate post-discharge site of care, avoiding delays in the discharge, transfer information, continuity of care, and the preparation and involvement of patients and their next of kin. On an aggregated level, the set of functions primarily involves decision-making and knowledge-sharing activities among various health-care personnel, disciplines, patients, and their next of kin. We need to examine how these functions vary in everyday discharge practices.

Performance variability—observed functioning of discharge practices

Our data indicated substantial variability in the way discharge functions are performed. Accordingly, patients, their next of kin, and health-care personnel reported some discharge practices as having been more successful than others. Success here was defined in terms of reported quality of information transfer, the level of post-discharge care, the duration of the process, and level of satisfaction. We found considerable variability in the discharge functions in three main dimensions:

Table 2 Brief description of hospital discharge functions

Function	Brief functional description	Contribution
Review of hospital inpatients—classifying patients that are medically fit for discharge.	Normally, hospital discharge is initiated by conducting a pre-ward round. The activity involves a clinical process in which the clinical care of hospital inpatients is reviewed. The responsible doctor reviews the patient's progress and determines whether the patient is medically fit for discharge. The activity normally involves knowledge sharing among a multidisciplinary team, including the lead consultant, interns, junior doctors, responsible nurse (primary nurse or team nurse depending on the nursing care model applied at the ward), and sometimes physiotherapists. It is essential that all relevant information is shared to support the appropriate care decisions; this indicates that input is needed from multiple sources (i.e., information about the patient's medical records, lab results, test results, medications, and functional and cognitive status). This function is controlled by guidelines for assessment stated in the regulations on municipal co-funding of patients ready for discharge [24].	Activates the discharge process.
Notifying the municipality that the patient is medically fit.	When the lead consultant has classified the patient as being ready for discharge, a message is sent to the receiving municipality (electronically, by phone or fax). For this notification to be considered valid, certain preconditions concerning discharge planning must be fulfilled as agreed upon in the cooperation agreements between the hospitals and municipalities.	Activates the discharge process in the receiving municipality; assigns an appropriate post-discharge site of care.
Informing the patient that they are ready for discharge.	The patient is normally informed about the decision for medical fitness during the ward rounds, which are the daily formal opportunity for dialogue and interaction among the patient, doctor, and care team. From the patient's perspective (preparedness and satisfaction), it is essential that they have been prepared and involved in the discharge planning process prior to the day of discharge (to reduce anxiety, distress, and strain). The ward round normally takes place after the pre-ward round activity is completed, and it is conducted at the patient's bedside. Normally, several professionals attend the ward rounds. In general, the round is led by the senior doctor or doctor in charge of the ward, with junior doctors or medical students and nursing staff present. This function is controlled by regulations stating the patient's right to information, participation, and involvement [25].	Prepares and provides the patient with discharge information or instructions and plans for follow-up care.
Assigning an appropriate post-discharge site of care and notifying the hospital.	The receiving municipality has (according to the cooperation agreement) a 3-hour response time (from the time the notification of the patient being medically fit is received—if sent correctly) to contact the hospital and indicate whether and when a post-discharge site of care is available. For the municipality to determine the most appropriate setting for post-discharge care, it is essential that there is compliance with the discharge planning agreements and that the hospital provides accurate and sufficient information. Different ways of organizing the coordination in discharge planning are recognized depending on the municipality size. In a city region, patient coordinators in the municipality are responsible for organizing the information exchange during the discharge. In a rural region, a helpline has been established across municipalities with an assigned person (i.e., head nurse at a nursing home) responsible for coordination in each municipality. In the city region, information is exchanged electronically between the hospital and patient coordinators in the municipality; in the rural region, this is done over the phone or via fax.	Avoids delayed discharges. Determines the most suitable post-discharge site or level of care.
Notifying and informing the patient's next of kin (if any).	Normally, the patient's nurse contacts (usually over the phone) the patient's next of kin (if any) to inform them about the discharge and plans for follow-up care when clarified. From the next of kin's perspective, it is essential that they are provided with information and are involved in the discharge planning process prior to the day of discharge. This function is controlled by regulations stating that the patient's next of	Prepares and provides the patient's next of kin with discharge information and plans for follow-up care.

Table 2 Brief description of hospital discharge functions *(Continued)*

	kin should receive information about the patient's state of health, treatment, and care provided (if the patient has given their consent) [25].	
Preparing a nursing discharge record.	The nursing discharge record is completed according to statutory regulations [26], stating that the patient's record shall be sent to the professionals who need the information to provide the patient with appropriate follow-up care. The nursing record should include descriptions of the nursing care delivered, the patient's status, assessments, and recommendations for continuing care.	Ensures written information transfer and continuity of care.
Preparing a medical discharge letter.	The medical discharge letter is similarly governed by regulations [26], stating that the discharge summary must contain information about the patient's medical diagnosis and former medical history, treatment performed during hospitalization, functional level and assessment, a complete medical list, and prescriptions for new medications. Plans for follow-up care are also provided. The nursing and medical record is normally not prepared until after the patient is deemed medically fit for discharge.	Ensures written information transfer and continuity of care.
Providing oral information about the transfer to post-discharge care providers.	When post-discharge arrangements have been clarified and confirmed by the receiving municipality, the patient's nurse contacts the assigned care facility to provide direct oral information about the patient. The function depends on pre-conditions, such as information and knowledge about the patient, follow-up care plans, hospital course, treatment, and current medications. The latter is emphasized as important to ensure that the receiving care providers or site of care have the patient's current medications available.	Ensures the continuity of care and agrees on a time of transfer.
Ordering transportation.	Transportation can be arranged and ordered after it has been clarified when and where the receiving municipality has availability. Patients can either be transported to the post-discharge site of care by ambulance, by taxi, or by next of kin, according to their conditions and preferences. If an ambulance is required, an order is sent electronically, which also specifies the time the patient will be ready for transfer.	Arranges suitable transportation.
Transferring the patient to the post-discharge site of care and ensuring the transfer of written information.	To ensure the continuity of care, it is crucial that written information be present and available when the patient leaves the hospital. This function is controlled by regulations [26], the cooperation agreement, and by established routines or procedures at the wards, which state the information that is to be provided. The information (nursing record and discharge letter) is sent with the patient on discharge in addition to being sent electronically or by post (to the receiving care providers and the patient's general practitioner). From the perspective of those assuming responsibility for post-discharge care, it is desirable that the patient be transferred and arrives during the daytime (9 a.m. to 3 p.m.) since more resources and greater competence are available then. There is also a challenge for health-care personnel in the municipality to contact hospital staff for clarification if the responsible doctor or nurse has ended their shift and the next shift has little knowledge of the patient. Similarly, hospital personnel prefer to transfer patients that are ready for discharge during the day shift to safeguard the process and avoid shift handover issues.	Ensures the continuity of care. Ends the hospital discharge process: the patient physically leaves the hospital, and the municipality takes over responsibility.

1. *Timing* (the time of day the discharge functions were carried out),
2. *Duration* (the time spent performing the functions) and,
3. *Precision* (performance characteristics and perceived success of the function by the various stakeholders)

We found time to be a main source of variability. The temporal range in the functional variability was the duration of the discharge process, and it varied considerably among the 20 patients, from a few hours to a few days. The main variations in precision were related to the following: (1) decision-making criteria with respect to medical fitness and post-discharge arrangements; (2) the quality of the

discharge planning process; (3) patient participation and engagement of their next of kin; and (4) the quality of the information transfer. The variability for each function and the recognized and reported outcome variability are presented in Table 3.

Performance-shaping factors

A PSF is anything that affects the health-care provider's performance of a function within the health-care system [27]. We found multiple, diverse PSFs, which accounted for the variability presented in Table 3. In this section, we will examine only the main variations.

Temporal conditions

Temporal variability across the observed cases was typically determined by the three functions indicated below. These functions served either to activate or delay the discharge process, and they thereby influenced the overall duration of the discharge processes (from being determined medically fit to the transfer of care). Variability in these three linked functions created time constraints on associated functions. The three functions were as follows:

- Review of hospital inpatients—classifying patients that are medically fit for discharge.
- Notifying the municipality that the patient is medically fit.
- Assigning an appropriate post-discharge site of care and notifying the hospital that site.

One of the most critical functions is the review of hospital inpatients to determine whether a patient is medically fit for discharge. This function activates the overall discharge process and affects all subsequent functions by determining when they are initiated. Considerable variations were identified in terms of the actual time (hour of day) the patient was determined medically fit; the range was from 9 a.m. to 1:30 p.m. The discharge process was found to be more rushed when the patients were declared medically fit later in this period, i.e., after noon. This was because of the reduced possibility to prepare the discharge requirements for care transfer if the transfer was to take place the same day. The health-care personnel clearly stated that time pressure potentially increased performance variability, affecting precision issues. The following statements reflect these concerns:

> "It's busy . . . of course there is an increased chance or risk that you forget something." (Chief doctor, orthopedic ward)

> "It's clear that things can happen a lot faster toward the end of the day." (Head nurse, orthopedic ward)

> "After the decision was made that I was ready to be discharged, it was a rush right up to the time I left . . . It was like I had to get dressed and get out." (Patient, female 87 years)

Other factors stated as influencing the duration were as follows: the quality of the discharge planning process; patient characteristics; the degree of simultaneous responsibilities among the clinical team; the degree of familiarity with the inpatients; and the availability of sufficient resources, i.e. updated patient information. Doctors often referred to pending lab and test results as a factor that guided the decision about medical fitness; this affected the duration and completeness of the decision-making process.

The temporal completeness of the decision about medical fitness determined the time (hour of day) of notifying the local municipality. This function activates the discharge process for the receiving municipality (i.e., assigning an appropriate post-discharge site of care); if there are delays through late notification, this puts time pressure on the municipality personnel. Bed availability in the receiving municipality determined whether the patient was assigned a post-discharge site of care on the day they were determined medically fit or if they had to spend additional days in the hospital—a delay in the discharge process.

Time variations in determining medical fitness have knock-on effects across the system. In particular, when decisions are made later in the day, this created time pressure for local municipality personnel, who had to initiate the functions related to care planning and post-care transfer. This time pressure was exacerbated by financial penalties for delayed discharge; these encourage municipal staff to rush care planning to avoid paying the daily fee. Such time pressure could have a knock-on effect in terms of the precision of care planning. Only five of the 20 patients in our study spent additional days at the hospital: the time varied from 1 to 5 days. It was emphasized, especially by nurses, that there was better time to prepare and perform the discharge functions if the patient spent additional days at the hospital. Some nurses acknowledged that the available time could affect precision issues in particular related to patient and next of kin involvement, discharge planning, and quality of information transfer. This was confirmed by the patients and their next of kin. Patients who spent additional days in the hospital stated that they had more time to prepare mentally for the discharge, and this appeared to be connected with a higher level of patient and next-of-kin satisfaction.

Precision issues

We identified considerable variability in the decision-making criteria concerning both the decision about medical

Table 3 Functional performance and outcome variability in hospital discharge of elderly patients

Functions	Variability in discharge practices		Variability in outcome
	Time and duration	Precision	
Review of hospital inpatients—classifying patients that are medically fit for discharge.	Time of day when the decision was determined.	Criteria upon which the decision was established and degree of knowledge sharing with the care team.	Time of day the patient was determined medically fit (i.e., duration of the discharge process) Patient's degree of readiness Receiving health-care provider's degree of satisfaction with the decision about medical fitness.
Notifying the municipality that the patient is medically fit.	Time of day when the municipality was notified.	Degree of compliance with cooperation agreements.	Duration of the discharge process (i.e., delay in the discharge process in the case of non-compliance).
Informing the patient that they are ready for discharge.	Time of day the patient was informed and time allotted to each patient.	Approaches concerning content or type of information provided, the language used, and how the patient was approached.	Patient involvement in the discharge planning process and degree of satisfaction.
Assigning an appropriate post-discharge site of care and notifying the hospital.	Time of day the hospital was notified	Criteria for prioritizing patients for post-discharge care.	Duration (i.e., number of additional days spent after being determined medically fit). Level of post-discharge care offered. Degree of satisfaction concerning post-discharge arrangements.
Notifying and informing the patient's next of kin (if any).	Time of day relatives were informed and time spent.	Degree of information provided and by whom (level of competence, doctor or nurse).	Next of kin's degree of satisfaction and perceived involvement in the discharge planning process.
Preparing a nursing discharge record.	Time of day the record was prepared and time available (time spent).	Prevalence and quality of the contents.	Quality of the information transfer Receiving health-care provider's degree of satisfaction.
Preparing a medical discharge letter.	Time of day the letter was prepared and time available (time spent).	Quality of the contents, structure, and readability.	Quality of the information transfer Receiving health-care provider's degree of satisfaction.
Providing oral information about the transfer to post-discharge care providers.	Time of day and time spent.	Degree and quality of the information provided and by whom (level of competence).	Receiving health-care provider's degree of satisfaction.
Ordering transportation.	Time/hour arranged for transfer.	The choice of arrangements and transportation (taxi, ambulance, next of kin) and the dialogue between the doctor and nurse.	The responsible doctor's involvement in the decision concerning the time for transfer—affected degree of time pressure to prepare the medical discharge letter.
Transferring the patient to the post-discharge site of care and ensuring the transfer of written information.	Time of day the patient was transferred.	Degree of compliance with arrangements. Unpredictable if carried out by the ambulance service (owing to simultaneous responsibilities).	Time of day the patient arrived in primary care and the receiving health-care provider's degree of satisfaction with the time of arrival.

fitness and post-discharge arrangements. The quality of the discharge planning process also varied among the patients, as did patient involvement and quality of information transfer. As indicated above, the temporal conditions (i.e., degree of time pressure) are a major PSF that influences the precision issues. Below, we describe other PSFs that influence precision.

Medically fit for discharge

There was variability in the criteria for the decision about medical fitness and its quality, especially among the hip fracture patients. For example, doctors appeared to put different emphasis on involving and consulting with the responsible nurse or the patient in their decision-making process. At one ward (orthopedic), nurses were not present when the decision for medical fitness was determined. This was explained as being due to institutionalized routine and effectiveness. The contribution of nurses to the decision-making process varied. Some were passive and did not interact with the doctor; others participated more actively. Work experience, relationship with the doctor, the doctor's characteristics, and the degree of familiarity with the patient were cited as possible explanatory factors for this. In several cases, doctors and nurses were unfamiliar with the patient; this was explained as being due to time off work, the patient's short hospital stay, and high patient turnover. The degree of familiarity (i.e., care continuity) was observed to affect the level of knowledge sharing among the doctors and nurses in the decision-making process. Some orthopedic doctors also indicated that they were more thorough

(spent more time) with patients for whom they felt responsible (e.g., patients on whom they had performed surgery), and this potentially influenced the decision-making process.

Nurses in municipal services experienced variability in the doctors' criteria for regarding patients as medically fit. Some wards seemed to pay more attention to the patients' overall health-care status rather than the strict clinical condition; this was particularly true of hip fracture patients. For example, there was a lack of attention to the underlying social or physical causes of a patient's fall and hip fracture. In contrast, geriatric wards appeared to make more holistic decisions and took into account factors beyond the medical determinants, such as assessing activities of daily living, cognition, social support, psychological well-being, and psychosocial factors.

Another factor that affected the decision-making criteria was bed availability. Doctors were particularly under pressure to discharge patients when units were crowded. In one case, it was observed that the head of a medical department on a morning visit informed the head nurse that they should discharge patients that day since there had been many new arrivals in the emergency unit.

Post-discharge arrangements

The level and site of post-discharge care varied among the patients; these especially affected the patient and next-of-kin satisfaction with the discharge process. The next of kin appeared to be more pleased if the patient was discharged to a nursing home rather than to home with health-care services. The majority of the patients in this study were discharged to a higher level of post-discharge care than the care they had received prior to admission. Of the 20 patients, 18 were admitted to the hospital from home; of these, 16 were discharged for a short-time stay at a nursing home. The remaining four patients were discharged directly to home with home health-care services. Not all the patients in this study had next of kin; however, for those that did, the next of kin played an important role as advocates in the decision making. In some cases, the next of kin questioned whether their involvement and persistence had an impact on the level of post-discharge care offered.

According to the patient coordinators (responsible for determining the appropriate level of post-discharge care), a number of factors influenced the decision-making process. These factors included the following: information and recommendations provided by the hospital; the quality of the discharge-planning process; prior knowledge or familiarity with the patient (the nature of the patient's current home and its suitability for the patient's condition and the presence of next of kin); degree of pressure from the next of kin; financial incentives; and current availability of beds and resources in the receiving municipality. According to hospital providers, some municipalities struggled more with availability than others. For some patients, the patient coordinator and assigned municipality staff tried to negotiate a later discharge date if the municipality had limited capacity. Hospital providers also stated that owing to a lack of bed availability and to avoid paying the daily fee, municipalities could decide to discharge patients directly to home with home-based nursing care—even if a short-term nursing home stay was recommended by the hospital.

Quality of the discharge planning process

The degree of compliance with discharge planning agreements varied among the patients. Municipality personnel, i.e., patient coordinators and assigned contact people, stressed the importance of good discharge planning (compliance with discharge arrangements and close dialogue during the hospital course) in determining the most appropriate setting for post-discharge care and to avoid delays. Short hospital stays were a challenge in the discharge planning process. For example, it was not unusual for municipality personnel to receive the medical and nursing records describing the patient's activity level and cognitive status on the same day as they received the decision for medical fitness. As such, patient coordinators had less time to make the preparations for the necessary post-discharge care. It was also apparent that some units were more efficient than others in notifying the municipality early on the day of discharge. Ward leadership seemed to play a key role in this regard. Some head nurses were more active in communicating with the care team. They verified compliance with the discharge planning agreements and reminded the responsible nurses to send notification about the patient being medically fit for discharge to the municipality.

Degree of patient participation and engagement of next of kin

This study also found considerable variability in how patients and their relatives were involved in the discharge planning process; this influenced the success of the post-discharge planning and overall satisfaction. The notification about discharge was often unexpected, which indicates that patients and their next of kin may have been insufficiently involved in the discharge planning process.

New discharge planning demands (i.e., requirements for information exchange, notifications during hospitalization) increased administrative work, and documentation limited the interaction between health-care providers (especially nurses) and patients and their next of kin. We found that the interaction between health-care personnel and patients varied according to the following: the type of information provided; the language used; how the personnel approached the patient (standing, speaking above the patient, speaking

directly to the patient); the engagement with patient preferences; and different degree of encouragement.

The time allotted to each patient when providing the discharge information also varied considerably—from 3 to 10 minutes. Doctors and nurses offered several explanations for this variability, such as individual characteristics and communication skills, patient characteristics, various conditions and preferences for participation, and time pressure. The patient's characteristics (cognitive or mental status, disabilities, communication skills, and complexity of care) and preferences also showed great variation. Some patients were more active than others or had more knowledge of their situation, diagnoses, and medications; this appeared to affect the degree of information and knowledge sharing between patients and doctors.

Quality of the information transfer

The quality of the information transfer, i.e., nursing records and medical discharge summaries, was reported to vary considerably among the patients. A nursing record was present for 16 of the 20 observed patients, and a medical discharge letter was available for all the observed patients. With 11 patients, health personnel outside the hospital reported information inconsistencies or inaccuracies, such as missing information about medicine regimes, lab test results, or follow-up care plans. For three patients, the medication list was lacking (hip fracture patients), and two patients were discharged with the wrong medication list.

The receiving health-care providers generally found that the discharge letters prepared by the medical doctors, especially geriatric doctors, were of good quality; conversely, the surgical discharge summaries tended to have more incomplete or missing information. For three patients, there was inconsistency between what the nurse wrote and what the doctor wrote about the same patient. Variability in the content and quality here may be explained by the character of the hospital unit and the doctor's specialization and preferences. Deficiencies in the nursing records at discharge were explained by the hospital nurses as being due to the lack of care continuity, a short hospital stay, insufficient and poor documentation, temporal conditions, and the degree of simultaneous responsibilities (e.g., number of patient discharges for which the nurse was responsible, new admissions requiring attention). Information provided in nursing records was often characterized by cutting and pasting from previous documents if nurses were unfamiliar with the patient.

Senior doctors often delegated the responsibility for preparing the medical discharge summary to interns, junior doctors, or medical students. However, we found variations in the senior doctors' quality assessment of records before being sent with the patient or to receiving healthcare personnel. At some hospital wards, it was a standard procedure for all discharge letters to be approved by a senior doctor, but in others this was not normal practice. Hospital doctors referred to several influential factors that affected both temporal and precision issues. These included the following: level of familiarity with the patient; degree of available and accurate information; patient characteristics (e.g., degree of complexity of condition, length of hospital stay); information input overload (influenced by the patient characteristics, length of hospital stay, number of transfers within the hospital, number of doctors involved); time pressure (influenced by the time of day the letter was prepared); and the degree of simultaneous responsibilities (e.g., the number of patient discharges, new admissions requiring attention, and other tasks to perform). Nurses at the orthopedic wards reported inconsistencies and unpredictable patterns related to the doctors' presence in the wards, which resulted in difficulties in preparing a medical discharge document on time.

In summary, this study identified multiple, diverse PSFs that influenced the functioning of hospital discharge. They included the following: variations attributed to temporal conditions (i.e., degree of time pressure) surrounding the discharge process; the characteristics of the individuals and care team involved (doctors, nurses, other members of the care team and their approach, preferences, risk awareness, decision-making criteria, communication and team skills); variability in patient factors (i.e., resources, preferences, cognitive or mental status, disabilities, communication skills, complexity of care); organizational factors (i.e., the unit, specialization, work organization, leadership, institutionalized routines); and local work environment factors (i.e., bed availability, familiarity with the patient, current availability in municipal services, simultaneous responsibilities, quality of the discharge planning process, and degree of pressure from the next of kin).

Discussion

Most research about hospital discharge has tended to focus on particular, isolated aspects (i.e., information transfer, discharge planning, patient participation, medication reconciliation) [28-31], specific outcome measures (i.e., adverse events, readmission rates, adverse drug events, satisfaction with care) [32-36], or the experiences of professional groups or stakeholders in isolation [10,28,37]. As such, the present study is unique since it applies a multiple-stakeholder perspective in examining hospital discharge functions, variability and the factors contributing to the variability, and perceived outcomes in discharge practice. Through the application of the FRAM, this study expands our understanding about the complexity of hospital discharge and context-specific factors that explain hospital discharge, shape performance, and introduce variability.

This paper demonstrates that the FRAM is a powerful method for studying and analyzing the complexity of hospital discharge practice; it provides a detailed, systemic analysis of hospital discharge for elderly patients, which has not previously been presented. Our findings illustrate how hospital discharge for elderly patients is a commonly occurring function, though it varies in numerable ways. By observing the everyday practice of hospital discharge for these patients, we have identified the common functions that typically occur on the day of discharge and the multiple, diverse sources of performance variability among those functions (i.e., timing, duration and precision issues).

Individual characteristics are an important determinant of performance [38], and studies conducted of PSFs in health care at the individual level have largely focused on fatigue, stress, and aging [39]. The interaction of individual characteristics is fundamental to team performance [40]. The present study emphasizes the importance of knowledge sharing, especially among doctors and nurses, toward appropriate decision making. The degree of familiarity with the patient was perceived to have strong implications for the quality and level of knowledge sharing among the members of the care team. This is in accordance with previous findings, where a lack of familiarity with patients was found to compromise assessments and the decision- making process [10]. Research on team performance has been conducted within specific settings, especially in intensive care units, operating theaters, and emergency medicine, and has been largely concerned with emergency patient-care processes [41]. Less attention has been given to the role of team performance on more complex inter-organizational processes, such as hospital discharge. This area needs to be investigated further along with factors that facilitate or constrain successful team performance during hospital discharge.

Individual and team performance is further influenced by organizational factors, e.g., unit, specialization, leadership, work organization, and institutionalized routines. Hospital wards are highly specialized and are perceived as shaping the clinician's and care team's preferences, attention, information exchange, and decision-making criteria. In this study, the unit of analysis (the hospital ward) had an impact on outcome (i.e., satisfaction, decision-making criteria, and quality of information transfer). The receiving health-care care providers appeared to make more negative remarks about the process related to patients discharged from orthopedic wards than from medical, especially geriatric, wards. The importance of geriatric knowledge and assessment has been investigated in previous studies [10,42,43]; there, it was argued that increasing specialization within health professions and fragmentation through disciplinary knowledge may result in inappropriate decisions that fail to meet the complex needs of patients [10,40]. Despite such concerns, the impact and effect of organizational factors (e.g., ward specialization) related to specific discharge processes and outcomes demands investigation. Future studies should extend our understanding of the relationship among ward or clinical specialization, discharge functioning, and discharge outcomes.

Our findings also raise the awareness of the temporal aspects related to the current discharge processes. The results of this study strongly suggest that the time of day the patient is declared medically fit is important: this determines the temporal conditions (degree of time pressure) for the subsequent actions. This decision about medical fitness being made later in the day (after noon) was associated with increased time pressure; it led to variability, and it affected duration and precision issues. Previous studies have addressed the importance of the timing of discharge [10]; they indicated that the time interval (i.e., time between making the decision for a patient to be discharged and the actual transfer) is a potential barrier for information sharing since time constraints lead to less flexibility, greater time pressure, and increased performance demands [44]. Psychological studies have shown that time pressure decreases performance standards [45]. However, this matter has not been systematically addressed within health care.

A key contextual factor that was perceived as affecting the temporal completeness of the decision about medical fitness was availability of beds. The problem of crowded wards and its implications on performance have been illustrated with the notion of "going solid" [46], and it leads to increased pressure to discharge patients so as to make way for new ones. It puts pressure on the clinical decision-making process, encouraging staff to accelerate the completion of care, increases performance pressure, and creates the potential for poor performance [46]. Our results suggest that the time aspects influencing discharge performance and outcome should be further examined for hospital discharge practices on a larger scale.

The results presented here further emphasize the role of the elderly patient (i.e., their resources, preferences, needs, communication skills, cognitive and functional status, and capacity to participate) and that of their next of kin (i.e., preferences, involvement, and degree of pressure) in the reported satisfaction with the discharge process and outcome. Patient factors have been found to affect the elderly patient's ability to be involved or participate in the discharge process [47]; however, knowledge is limited on the factors that facilitate or hinder patient-centered performance during the discharge process [48]. It has been suggested that clinicians should put more effort into understanding patients' and relatives' preferences for participating in decisions concerning discharge and that clinicians should tailor their approach to meet

specific needs [49]. The time allotted, language used, number of people present, and disturbing elements were described as factors that influenced patients' and relatives' involvement, understanding, and level of satisfaction. In accordance with our results, financial factors, lack of familiarity with the patient, bed availability, and lack of time have been identified as factors that constrain patient-centered performance [44,48].

With the inclusion of the multiple-stakeholder perspective, our findings also reveal one of the main challenges with the FRAM approach in the context of health-care delivery. The FRAM appears to emphasize health-care providers' definitions and concepts of acceptable, successful outcomes without considering the experiences of patients and their next of kin. Our results illustrate that the various stakeholders had different concerns and used different measures to evaluate the degree of successful hospital discharge functioning. This study implies that the assessment of acceptable, successful outcomes depends on the focus of the stakeholder groups. We argue that the process of determining successful outcomes must incorporate all stakeholder groups. The multiple perspectives of all stakeholders, including patients and their next of kin, have not received systematic attention in the literature on hospital discharge [10]; it has been suggested that the experiences of patients and their next of kin provide valuable input and can help produce improvements [50-52].

From our results, we would argue that the multiple PSFs related to hospital discharge and multiple-stakeholder perspectives have not been fully considered in interventional studies targeted at improving this process. Our findings illustrate that it is insufficient to isolate functions (i.e., merely consider information transfer, patient participation, decision-making processes) as independent activities (i.e., treat them as "functional silos") owing to the functional dependencies on which hospital discharge performance relies. Future studies on hospital discharge should consider the health-care providers involved, the available resources, the patient being discharged, their next of kin, the organizational setting, and the current situational factors related to the functioning of discharge. Without considering these interdependencies, progress on hospital discharge improvements will be constrained [9,14,53,54].

Study limitations

There are several limitations that should be considered when interpreting our results. The observations took place during regular working hours (8 a.m. to 4 p.m.). Thus, evenings, nights, and weekends were excluded owing to practical and resource-based issues. This represents a possible limitation because other performance issues (variability, PSFs) may be influential at other times. This study was performed in the context of the Norwegian health-care system with a relatively small sample size (20 patients) in two hospitals, which restricts the generalizability of the findings. Possible observer bias should also be mentioned since the observations were conducted by a single researcher (first author) with a nursing background, which entails a pre-understanding of the context. Such an inside perspective may advance data collection but also affect the accuracy of the observations. An observation team with a minimum of two researchers with different backgrounds could better cover the complexity of the observation setting involving both professional and patient or next-of-kin perspectives. We tried to control this observer bias by setting up weekly meetings or updates in the observation periods with the larger research team (the members have backgrounds in nursing, management, and safety) to discuss preliminary impressions. Triangulation during the analysis process was carried out, with the three authors and members of the research team all being active in discussing the findings. Following the aims of the paper we have chosen to focus on the FRAM`s applicability to hospital discharge to explore its characteristics (e.g. functions) and general patterns of variability in discharge practices rather than addressing the specificities of each case. Finally, the study focused on the final stage of hospitalization, i.e., the actual discharge process. It would have been valuable for the study to have acquired data on the patients' course from the day of admission to the end of their hospital stay.

Conclusions

Hospital discharge is a complex multi-agency care process that is composed of multi-functional activities; it has multiple purposes, but its core activities are decision making and knowledge sharing. Through the application of the FRAM and use of observational methods, we have provided detailed insight into the range of functions that are performed during hospital discharge. We have called attention to the ways in which these functions vary, and we gained insight into the multiple PSFs that can be attributed to a range of contextual features (situational, organizational, individual teams, patients, next of kin, regulatory influences and interdependencies). Such multifaceted understanding of PSFs is necessary in improving hospital discharge practices.

Based on our findings, we argue that the existing, sequential approaches to the complexity of hospital discharge are inadequate. Given the interdependence among the functions, there is a need for corresponding multi-factorial interventions. Future research should focus on understanding the relationships between various functions and PSFs and their impact on hospital discharge practices and outcomes.

Study results illustrate that the FRAM represents a powerful methodology, enabling new insight into complex

inter-organizational processes. Further on study findings emphasize that functional performance and outcomes entail various stakeholder perspectives whereby assessment of acceptable, successful performance and discharge outcomes depends on each individual perspective. These differences in outcome values need to be acknowledged in order to create a common ground on what constitutes acceptable, successful discharge functioning.

Additional file

Additional file 1: STROBE Statement—checklist of items that should be included in reports of observational studies.

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
KAL participated in the study design, was responsible for the development of data collection tools, carried out data collection and data analysis, and drafted and revised this manuscript. KA was responsible for the conception of the study, planned the study design, and contributed to the development of data collection tools, data analysis, and manuscript draft and revision. JW contributed to the data analysis, manuscript drafting, editing, and revision. All authors read and approved the final manuscript.

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References
1. Laugaland K, Aase K, Barach P: **Addressing risk factors for transitional care of the elderly – Literature review**. In *Healthcare Systems Ergonomics and Patient safety 2011 – An alliance between Professionals and Citizens for Patient Safety and Quality of Life.* Edited by Albolini S, Bagnare S, Bellani T, Llaneza J, Rosal G, Tartaglia R. London, UK: CRC Press, Taylor & Francis Group; 2011. ISBN ISBN ISBN: 978-0-415-68413-2.
2. Foster AJ, Murff HJ, Peterson JF, Gandhi FJ, Bates WD: **The incidence and severity of adverse events affecting patients after discharge from the hospital.** *Ann Intern Med* 2003, **138:**161–167. [http://annals.org/article.aspx?articleid=716006]
3. Long JS, Brown FK, Ames D, Vincent C: **What is known about adverse events in older medical hospital inpatients? A systematic review of the literature.** *Int J Qual Health Care* 2013, **25**(5):542–554.
4. Vincent C: *Patient Safety.* Oxford: Wiley- Blackwell; 2010.
5. Tsilimingras D, Bates DW: **Addressing postdischarge Adverse events: A Neglected Area.** *Jt Comm J Qual Patient Saf* 2008, **34**(2):85–97.
6. Kripalani S, LeFevre F, Phillips CO: **Deficits in Communication and Information Transfer between Hospital- Based and primary care physicians.** *JAMA* 2007, **297**(8). [http://jama.jamanetwork.com/article.aspx?articleid=205790]
7. Rennke S, Nguyen O, Shoeb H, Magan Y, Wachter R, Ranji RS: **Hospital-initiated Transitional Care interventions as a Patient safety Strategy.** *Ann Intern Med* 2013, **158**(5):433–441. [http://annals.org/article.aspx?articleid=1656449]
8. Rowley E, Waring J (Eds): *A Socio-cultural perspective on patient safety.* Farnham Surrey, UK: Ashgate Publishing Limited; 2011.
9. Abraham J, Kannampallil GT, Patel LV: **Bridging gaps in handoffs: A continuity based approach.** *J Biomed Informantics* 2012, **45:**240–254. [http://www.j-biomed-inform.com/article/S1532-0464(11)00177-8/abstract]
10. Robinson CA, Bottorff JL, Lilly MB, Reid C, Abel S, Lo M, Cummings GG: **Stakeholder perspectives on transitions of nursing home residents to hospital emergency departments and back in two Canadian provinces.** *J Aging Stud* 2012, **46:**419–427. [http://www.ncbi.nlm.nih.gov/pubmed/22939538]
11. Hollnagel E: **An Application of the Functional Resonance Analysis Method (FRAM) to Risk Assessment of Organizational Change**. In *Swedish Radiation Safety Authority, Report number.* 2013:09. [http://www.stralsakerhetsmyndigheten.se/Publikationer/Rapport/Sakerhat-vid-karnkraftverken/2013/201309/]
12. Rankin A, Lundberg J, Woltjer W, Rollenhagen C, Hollnagel E, Resilience in Everyday Operations: **A Framework for Analyzing Adaptions in High- Risk Work.** *J Cognitive Eng Decision Making* 2013, **XX**(No X):1–20.
13. Amalberti R: **Resilience and Safety in Health Care: Marriage or Divorce?** In *Resilient Health Care.* Edited by Hollnagel E, Braithwaite J, Wears R. Farnham Surrey, UK: Ashgate Publishing Limited; 2013.
14. Hollnagel E: *FRAM: the functional resonance analysis method.* England: Modeling complex socio- technical systems. Ashgate Publishing Limited; 2012.
15. Yin RK: **Case study research: design and methods**. In *Applied social research methods serie.* 3rd edition. Thousand Oaks: SAGE Publications; 2003.
16. Leslie M, Paradis E, Gropper AM, Reeves S, Kitto S: **Applying ethnography to the study of context in healthcare quality and safety.** *BMJ Qual Saf* 2013, **0:**1–7. [http://qualitysafety.bmj.com/content/early/2013/10/04/bmjqs-2013-002335]
17. *Report no. #47 (2008–2009). Report to Parliament: Coordination reform: Proper treatment – at the right place and right time.* [http://www.regjeringen.no/upload/HOD/Samhandling%20engelsk_PDFS.pdf]
18. Majeed MU, Williams DT, Pollock R, Amir F, Liam M, Foong SK, Whitaker JC: **Delay in discharge and its impact on unnecessary hospital bed occupancy.** *BMC Health Services Res* 2012, **12**(1):410. [http://www.biomedcentral.com/1472-6963/12/410]
19. Miles MB, Huberman MA: *Qualitative data analysis.* Secondthth edition. London, UK: Sage Publication; 1994.
20. Dewalt KM, DeWalt BR: *Participant observation: a guide for fieldworkers.* Plymouth, UK: AltaMira Press; 2011.
21. Hammersley M, Atkinson P: *Ethnography: Principles in practice.* Thirdthth edition. Abingdon, Oxon: Routledge; 2007.
22. Pentland TB: **Sequential Variety in Work Processes.** *Organizational Sci* 2003, **14**(5):528–540. [http://www.jstor.org/discover/10.2307/4135147?uid=25578&uid=3738744&uid=2129&uid=2&uid=70&uid=3&uid=5909240&uid=67&uid=25576&uid=62&sid=21104644953503]
23. Moray N: **Culture, politics and ergonomics.** *Ergonomics* 2000, **43:**868–868.
24. Law concerning Pri: *Law concerning Primary Health and Care Services.* Norwegian: 2012. [http://lovdata.no/dokument/NL/lov/2011-06-24-30]
25. *Patient right Act.* 1999. [http://lovdata.no/all/nl-19990702-063.html]
26. *The Norwegian Patient Record Regulation.* 2000. [http://lovdata.no/dokument/SF/forskrift/2000-12-21-1385]
27. Rooney JJ, Vanden Heuvel NL, Lorenzo KD, Reduce human error: **How to analyze near misses and sentinel events, determine root causes and implement corrective actions**. In *Quality Progress. American Society for Quality.* 2002. Retrived from: [http://en.calidadpr.com/reducing%20human%20error%20QP.pdf]
28. Hilligoss B, Cohen M: **The Unappreciated Challenges of Between- Unit Handoffs: Negotiating and Coordinating Across Boundaries.** *Ann Emerg Med* 2013, **61**(2):155–160. [http://www.ncbi.nlm.nih.gov/pubmed/22560466]
29. Bauer M, Fritzgerald L, Haesler E, Manfrin M: **Hospital discharge planning for frail older people and their family. Are we delivering best practice? A review of the evidence.** *J Clin Nurs* 2009, **18**(18):2539–2546. [http://www.ncbi.nlm.nih.gov/pubmed/19374695]

30. Foss C, Hofoss D, Romøren TI, Bragstad LK, Kirkevold M: **Elderly patients' experiences with hospital discharge (in norwegian).** *Sykepleien Forskning* 2012, **7**(4):324–333. [http://www.sykepleien.no/forskning/forskningsartikkel/1038259/eldres-erfaringer-med-utskrivning-fra-sykehus]
31. Vira T, Colquhoun M, Etchells E: **Reconcilable differences: correcting medication errors at hospital admission and discharge.** *Qual Saf Health Care* 2006, **15**(2):122–126. [http://qualitysafety.bmj.com/content/15/2/122.long]
32. Foster AJ, Clark HD, Menard A, Dupuis N, Chernish R, Chandok N, Khan A, Van Walraven C: **Adverse events among medical patients after discharge from hospital.** *CMAJ* 2004, **170**(3):345–349. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC331384/]
33. Mesteig M, Helbostad LJ, Sletvold O, Røsstad T, Saltvedt I: **Unwanted incidents during transition of geriatric patients from hospital to home: a prospective observational study.** *BMC Health Serv Res* 2010, **10:**1. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2827472/]
34. Coleman EA, Smith JD, Raha D, Min SJ: **Posthospital medication discrepancies: prevalence and contributing factors.** *Arch Intern Med* 2005, **165**(16):1842–1847. [http://archinte.jamanetwork.com/article.aspx?articleid=486693]
35. Gruneir A, Dhalla AI, Walraven C, Fischer DH, Camocho X, Rochon AP, Anderson MG: **Unplanned readmissions after hospital discharge among patients identified as being at high risk for readmission using a validated predictive algorithm.** *Open Med* 2011, **5**(2):104–111. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3148002/]
36. Bull MJ, Roberts J: **Components of a proper hospital discharge of elders.** *J Adv Nurs* 2000, **35**(4):571–581. [http://www.ncbi.nlm.nih.gov/pubmed/11529957]
37. Reid CR, Cummings EG, Cooper LS, Abel LS, Bissell JL, Estabrooks AC, Rowe HB, Wagg A, Norton GP, Ertel M, Cummings GG: **The Older Persons' Transition in Care (OPTIC) study: pilot testing of the transition tracking tool.** *BMC Health Serv Res* 2013, **13:**515. [http://www.biomedcentral.com/1472-6963/13/515]
38. Patterson SE, Woods DD, Roth ME, Cook IR, Wears R, Render LM: **Three Key Levers for Achieving Resilience in Medication Delivery with Information Technology.** *J Patient Safety* 2006, **2**(1):33–38.
39. Leblanc RV, Manser T, Weinger BM, Musson D, Kutzin J, Howard KS: **The Study of Factors Affecting Human and Systems performance in Healthcare Using Simulation.** *Simul Healthc* 2011, **6**(7):24–29. [http://www.ncbi.nlm.nih.gov/pubmed/21817860]
40. Nancarrow AS, Booth A, Ariss S, Smith T, Enderby P, Roots A: **Ten principles of good interdisciplinary team work.** *Hum Resour Health* 2013, **11:**19. [http://www.human-resources-health.com/content/11/1/19]
41. Manser T: **Teamwork and patient safety in dynamic domains of healthcare: a review of the literature.** *Acta Anaesthesiol Scand* 2009, **53**(2):143–151. [http://www.ncbi.nlm.nih.gov/pubmed/19032571]
42. Kleinpell RM, Fletcher K, Jennings MB: **Reducing Functional Decline in Hospitalized Elderly in Patient Safety and Quality**. In *An Evidence-Based Handbook for Nurses.* Edited by Hughes RG. Rockville MD: Agency for Healthcare Research and Quality US; 2008. [http://www.ncbi.nlm.nih.gov/books/NBK2629/]
43. Caplan GA, Williams AJ, Daly B, Abraham K: **A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary interventions after discharge of elderly from the emergency department – the DEED II study.** *J Am Geriatrics Soc* 2004, **52**(9):1417–1423. [http://www.ncbi.nlm.nih.gov/pubmed/15341540]
44. Glenny C, Stolee P, Sheiban L, Jagal S: **Communicating during care transitions for older hip fracture patients: family caregiver and health care provider's perspective.** *Int J Integrated Care* 2013. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3817953/]
45. Tsiga E, Panagopoulou E, Sevdalis N, Montgomery A, Benos A: **The influence of time pressure on adherence to guidelines in primary care: an experimental study.** *BMJ Open* 2013, **3**(4). [http://bmjopen.bmj.com/content/3/4/e002700.full?rss=1]
46. Cook R, Rasmussen J: **Going Solid: A model of system dynamics and consequences for patient safety.** *Qual Saf Health Care* 2005, **14**(2):130–134.
47. Perry CAM, Hudson S, Ardis K: **"If I didn't have anybody, what would I have done?: Experiences of older adults and their discharge home after lower limb orthopedic surgery.** *J Rehabil Med* 2011, **43**(10):916–922. [http://www.medicaljournals.se/jrm/content/?doi=10.2340/16501977-0874]
48. Hesselink G, Link M, Olsson M, Parach P, dudzik-Urbaniak E, Orrego C, Toccafondi G, Kalkman C, Johnson KJ, Schoonhoven L, Vernooij- Dassen M: **Are patients discharged with care? A qualitative study of perceptions and experiences of patients, family members and care providers.** *BMJ Qual Saf* 2012, **21**(Suppl 1):39–49. [http://qualitysafety.bmj.com/content/21/Suppl_1/i39.long]
49. Popejoy L: **Participation of elder persons, families, and health care teams in hospital discharge destination decisions.** *Appl Nurs Res* 2011, **24**(4):256–262. [http://www.ncbi.nlm.nih.gov/pubmed/20974080]
50. Ocloo J, O'Shea A, Fulop N: **Empowerment or rhetoric? Investigating the role of NHS Foundation Trust governors in the governance of patient safety.** *Health Policy* 2013, **111**(3):301–310. [http://www.sciencedirect.com/science/article/pii/S0168851013001309]
51. Wiig S, Storm M, Aase K, Gjestsen MT, Solheim M, Harthug S, Robert G, Fulop N: **Investigating the use of patient involvement and patient experience in quality improvement in Norway: rhetoric or reality?** *BMC Health Serv Res* 2013, **13:**206. [http://www.biomedcentral.com/1472-6963/13/206]
52. Longtin Y, Sax H, Leape L, Sheridan ES, Donaldson L, Pitter D: **Patient Participation: Current Knowledge and Applicability to patient safety.** *Mayo Clin Proc* 2010, **85**(1):53–62. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2800278/]
53. Plesk EP, Greenhalgh T: **The challenge of complexity in health care.** *BMJ* 2001, **323:**625–628. [http://www.bmj.com/content/323/7313/625]
54. Kannampallil GT, Schauer FG, Cohen T, Patel LV: **Considering complexity in healthcare systems.** *J Biomed Inform* 2011, **44**(6):943–947. [http://www.ncbi.nlm.nih.gov/pubmed/21763459]

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Paper V

The demands imposed by a health care reform on clinical work in transitional care of the elderly: A multi-faceted Janus

Kristin Laugaland and Karina Aase

"One must constantly be aware that changes can increase the complexities of the health care system and generate new performance demands"

Introduction

Health care systems worldwide face challenges as demands increase including a growing elderly population, often requiring care by various providers in multiple settings. Promoting health care integration (i.e. coordination of care between and within various levels of the health care delivery system) has long been a concern and an ongoing challenge (WHO, 2008). Various strategies have been suggested to overcome and meet these challenges, taking into account various perspectives including the patients and next-of-kin, or system components such as quality, efficiency, correct utilization of resources or cost-effectiveness (Grone and Garicia-Barbero, 2001).

This chapter will focus on the adaptation of everyday clinical work to the demands imposed by a commonly used strategy to promote health care integration, i.e. system reforms to coordinate care between primary and specialist health care services. The aim of the reported study is to illustrate how clinical environments[1] adjust their functioning to sustain a set of new demands imposed by a system reform. This affects the perceived outcomes of transitional care[2] of the elderly, and more specifically the discharge of patients from hospital to primary health care. We argue that the outcome of hospital discharge of the elderly is a multi-faceted notion that varies depending on the different perspectives of the actors involved.

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1 By clinical environments we mean different wards or units in hospital and primary care respectively

2 By transitional care we mean a set of actions to ensure the coordination and continuity of health care as patients transfer between different levels of care within the same or other locations (Coleman and Boult, 2003)

The system reform described is the Norwegian Coordination Reform as of 2012, implemented to promote better coordination of primary and secondary health care services (Norwegian Ministry of Health and Care Services, 2009). By studying the changes imposed by this system reform, the chapter will provide opportunities to learn how clinical environments adjust to new performance demands, how they actually function, and how they sometimes mal-function. The chapter highlights some of the pertinent characteristics of everyday clinical work, namely the two-folded, and sometimes conflicting, goal of attending to both system demands and patient demands. The first section includes a brief description of the health care reform under study, followed by a brief overview of the discharge process and the way it is conceived to take place in regulation and agreements, corresponding to the work as imagined (WAI) concept of the resilience literature (Hollnagel 2012). In the second section we present findings from an empirical study conducted to identify work as actually done (WAD) in discharge practises. In the last section we discuss some of the resilience concepts in light of our study results.

Context

A system reform

One of the main focal areas of the Norwegian Coordination reform is to stimulate a good patient flow between hospitals and primary care institutions and to overcome challenges with delayed discharge better known as 'bed blocking' (i.e. patients blocking beds in specialist care while awaiting municipal services) (Majeed et al. 2012). Financial measures are thus implemented to facilitate rapid discharge involving municipal co-financing of the specialist health care services including financial responsibility for patients ready for discharge (Norwegian Ministry of Health and Care Services, 2009). Specifically, payment (533 EURO per day) is required if the municipality does not accept the responsibility for the patient before midnight the day he/she is determined ready for discharge. Hospitals and municipalities are also obliged by the government to make legally binding contracts to formalize requirements for the organization of the hospital discharge processes (i.e. tasks, responsibilities, interaction, information transfer, information contents, discharge planning, deadlines for information exchange). The reform poses new performance demands on both hospital and municipality in order to sustain efficient functioning of the discharge system.

The Coordination reform also highlights the importance of the patient perspective in order to ensure continuity and high quality care. Incorporating patient participation is thus referred to as essential to obtain improvements (Norwegian Ministry of Health and Care Services, 2009).

The discharge system according to the new reform

Hospital discharge of patients takes place on a day-to-day basis and involves a complex process of functions that requires interaction and coordination within and among a multi-disciplinary team of actors. Co-operation agreements between hospitals and municipalities require health care providers to assess the need of post-discharge care at admittance to hospital. If the patient is assessed to be in need for municipal services post-discharge the hospital must also notify the municipality within 24 hours after hospitalisation, or as soon as possible, predicting a discharge date. If the patient's condition is inconclusive or information first provided deviates, the hospital must notify the municipality during the patient's hospital stay. If follow-up care is assessed to be suitable, medical and nursing records describing the patient's activity level and cognitive status must be available prior to notifying the municipality (i.e. patient is medically fit for discharge). Recommendations concerning the level of post-discharge care are provided by the hospital based on their assessment. However, the municipality is eventually responsible for determining the appropriate post-discharge site or level of care. The patient or next-of-kin (if the patient suffers from cognitive impairment) must consent to the need for post-discharge health care services. In the co-operation agreements there is set a time criterion in terms of a three hour deadline for the municipality to determine where and when they have availability to receive the patient. The deadline is running from the time the municipality is notified by the hospital that the patient is medically fit if sent correctly (i.e. pre-conditions concerning discharge planning is fulfilled and present). Similar, the co-operation agreements state that the hospital should try to notify the municipality of patients ready for discharge as early as possible, preferably on the day before expected discharge or between 8 am - 4 pm Monday to Friday (12 am - 4 pm on weekends and holidays).

An Empirical study

The empirical study presented in this chapter is based on ethnographic descriptions of hospital discharge practices involving elderly patients (>75 years). Patterns of discharge practises were explored and assessed through direct observations of twenty discharge processes by using descriptions from several of the stakeholders involved (different health care personnel groups, patients, next-of-kin). Observations took place in three different hospital wards (geriatric, medical, surgical) and were conducted in two different hospitals in Norway. The patients were followed up to 30 days after discharge involving observation and conversations with primary care stakeholders. In addition, 57 in-depth interviews were conducted with healthcare staff across various disciplines (i.e. nurses, head nurses, doctors, general practitioners, patient coordinators) in hospital and primary care to gain further insight into their experiences with patient discharge functions and the system reform imposing changes to these functions.

Perceived adjustments to the discharge system

Our observations of transitional care of the elderly across different patient cases in different hospital and primary care settings have identified three main areas of adjustments made by the clinical environments as a result of the demands imposed by the Coordination reform. These adjustments involve: (1) Discharge planning between hospital and primary care; (2) Flexibility in primary care services to receive patients; and (3) Time efficiency on the day of discharge.

Discharge planning between hospital and primary care

Different ways of organizing coordination in discharge planning were recognized depending on the municipality size. In a city region patient coordinators in the municipality were responsible for organizing the information exchange during discharge. In a rural region a helpline was established across municipalities with an assigned person (i.e. head nurse at a nursing home) responsible for coordination in each municipality. In the city region information was exchanged electronically between hospital and patient coordinators in the municipality as opposed to the rural region where this was done over the phone or via telefax. At the hospital, the patient responsible nurse had a key role in coordinating information exchange during discharge planning. Various hospital wards kept track of the

running discharge planning by establishing an interactive note in each patient journal. Hospital doctors were to a various degree familiar with the discharge planning process: "*Concerning the practical issues of discharge planning, the nurses are seen as the most competent to run this … they are in touch with the patient and next-of-kin, plan and operate … it is a task the nurses resolve in a good way ... and we doctors only kind of sign off the work*" (chief doctor, orthopaedic ward).

Representatives in the municipalities stressed the importance of good discharge planning in order to determine the most appropriate setting for post-discharge care and to avoid delays in the discharges. Several patient coordinators and assigned municipality persons reported an increased self-interest in early and close dialogue during hospitalisation given primary care's financial responsibility for patients ready for discharge. They all endeavoured to contact the hospital shortly after they had been notified that their patients had been hospitalised asking about their condition, and expected discharge date. Hospital nurses had clearly noticed that primary care initiated early contact, which they reported as a positive initiative: *"I think it's very positive that primary care now more frequently contacts us to investigate the condition of their patients"* (hospital nurse, medical ward).

According to several patient coordinators they aimed at visiting their hospitalised patients in order to better assess patient needs for post-discharge care, especially in complex patient cases or if the coordinator was unfamiliar with the patient prior to hospitalisation. However, short hospital stays (or geographic distances) were stressed to impede this opportunity: "*The problem is that we do not have enough time to do a thorough review of patients … time is short … it often goes fast … patients are quickly classified as medically fit and ready for discharge"* (patient coordinator, municipality).

Hospital personnel also expressed an increased focus on dialogue with primary care services and compliance with discharge planning arrangements in order to avoid unnecessary delays due to non-compliance: *"After the new regulations we have been forced to think about discharge from day one*" (hospital doctor, medical ward). Similarly: *"It can postpone the process if we do not comply with the new demands concerning notifications and dialogue with the municipality during hospitalization … related to payments … that is an important issue … we are talking about a relatively large sum*" (hospital nurse, medical ward).

One a general basis, hospital and municipality personnel clearly expressed that an increased demand for dialogue imposed by the Coordination reform improved the discharge planning:

"There is a closer dialogue between hospital and municipality compared to previously … it's more structured … improving the discharge planning process … we get started earlier" (patient coordinator, municipality).

"*It* [the coordination] *has been more formalised, we become aware of discharge planning early on … Who needs to receive care in nursing home facilities? Who can be sent home? … The patient's current home condition has become vital … at least for me during the pre-ward round and the ward round … I think it is positive"* (chief doctor, medical ward).

Despite improved dialogue and coordination, it was clearly expressed by health care personnel at the hospital (especially nurses) that new discharge planning demands (i.e. requirements for information exchange, dialogue, notifications during hospitalisation) increased the demands on administrative work and documentation, moving them away from patient care. Similar concerns were raised by patient coordinators: "*The biggest challenge is that we are working fast … very often it's all about transferring papers … ergo we sometimes 'forget' the patient … that is one thing that we constantly are concerned with … it's almost like sending a parcel in the mail…..there are a lot of papers and issues to document …a lot of administrative tasks … well … I don't feel that we have the same patient-centered approach … it's become more important that all papers are in place and according to the agreements"* (patient coordinator, municipality).

The study results indicate that elderly patients and their next-of-kin's degree of involvement in discharge planning is unsatisfactory. A majority of the patients often expressed that discharge notification came suddenly and sometimes unexpectedly when confronted with the medical fit decision made by the responsible doctor at the ward. Several patients were clearly surprised and expressed incomprehensibility: *"Ready for discharge!? … how can I possibly leave the hospital when I can barely stand on my feet … When do I have to leave? … Oh not today!"* (patient, female 97 year, treated for hip fracture). Several patients seemed so disturbed with the fact that they were determined fit to be discharged that it appeared to impede their capacity to receive the discharge information provided to them. A patient treated for a deterioration of his chronic obstructive pulmonary disease was confronted with readiness for discharge shortly after he returned to the ward after going through a drainage of pleural fluid. The patient complained about dizziness and clearly expressed to the doctor that he was not ready and needed a day or two to get mentally prepared for discharge: *"You can't throw me out today … I need to have some time to relax … I have just gone through a tiresome procedure*" (patient, male 87 year). The doctor did not comply with the patient's request as there was pressure on

available beds and no medical reasons keeping the patient hospitalised. Similarly, next-of-kin commonly expressed the same view: *"Discharge came very sudden … I was not involved … they called the same day to inform that my mother was leaving. They could have called a day prior to discharge so that we could have been prepared*" (patient's next-of-kin).

When hospital nurses were asked how they involved the elderly patient in discharge planning various answers were given. Several admitted that patient involvement was insufficient: *"We are often not sufficiently aware of involving the patient and providing them with information during hospitalisation … this is something we could improve*" (hospital nurse, orthopaedic ward). A general practitioner raised the following concern when he was talking about discharge planning and criteria for classifying patients as medically fit for discharge from hospital: *"Medically fit … that`s a bit subjective … if we just let the discharge planning be a technical issue that some decision-making bodies take care of … then we abandon a very important perspective … the patient's voice … for who are we talking about? … to what extent does the patient feel ready for discharge? … that's not part of the discussion at all!"* (general practitioner, municipality).

Flexibility in primary care services to receive patients

In order to respond to the demands imposed on primary care for increased flexibility to receive patients ready for discharge various measures were recognized. In a city-based municipality an interim ward was established at a nursing home to ensure flow of patients and avoid prolonged hospital stays. Patients stayed from a few days up to a few weeks (depending on current resources and availability before being transferred to further primary care services). At the interim ward, focus was on assessing patients outside the hospital environment in order to determine an appropriate level of care post-discharge (i.e. rehabilitation ward, nursing home, home-based nursing). In rural-based municipalities, inter-municipal collaborations were established to increase flexibility meaning that municipalities could 'buy' temporary nursing home beds from each other based on available capacity. This would release time for the responsible municipality while awaiting availability (i.e. the payment rate would be lower than the one paid to the hospital).

Hospital personnel clearly expressed that the problem with delayed discharges had been significantly reduced after the Coordination reform. Only five of twenty patients in our study spent additional days at the hospital after they were determined medically fit (additional days varied from one to five days). Hospital personnel furthermore expressed

satisfaction with the decrease in delayed discharges and the municipalities' increase in flexibility to receive patients: *"It`s very satisfactorily that they* [the municipality] *have established a place* [interim ward] *to handle the patients … so that we can instantly get them out of the hospital"* (chief doctor, orthopaedic ward). Several hospital colleagues supported this view: "*Patients are discharged more rapidly now … an advantage is that we avoid having to place patients in the corridor … that has been considerably improved … I would say it's been like a revolution … on our behalf"* (chief doctor, orthopaedic ward).

According to hospital personnel some municipalities struggled more with availability compared to others. They experienced that primary care (patient coordinators, assigned municipality persons) tried to negotiate a later discharge date if they struggled with capacity. Hospital personnel also experienced that municipalities due to lack of availability could decide to discharge patients directly home with home-based nursing care even if a short-term nursing home stay was recommended by the hospital: "*There has been a couple of incidences when the patient has been sent home … even if we recommended a nursing home to be the most suitable post-discharge care … only to experience that the patient was re-admitted shortly after discharge … "* (chief doctor, medical ward).

Patient coordinators and assigned municipality persons, on the other hand, expressed that they felt forced (i.e. pressured from managers) to prioritise patients ready for discharge often at the sacrifice of patients living at home also in need of a short-time nursing home stay (i.e. patients ready for hospital discharge would induce more expenses): *"We do feel the pressure to get patients out of the hospital. Our managers keep track of the hospitalised patients according to whom we have to pay for … we have to answer to them when patients stay additional days … I once had two such patients which I received scolding for … they both had to spend four additional days after they were determined medically fit … due to lack of availability of what I assessed to be appropriate care … so that did cost us money … it's a bit like that … it's much about the money"* (patient coordinator, municipality). A nursing home nurse said that they had removed alternating care beds (patients alternating between nursing homes and home care services) in order to increase flexibility to receive patients ready for discharge from the hospital. The nurse questioned the long term consequences of such prioritisation.

Despite hospital personnel's satisfaction with the decrease in delayed discharges they also raised concerns about the quality of the care the elderly would receive in primary care:

"It was striking how difficult it was to receive patients immediately before the reform … and suddenly overnight, how extremely easy it was when the reform was enforced … what provisional solutions have they applied? … I just have to trust the municipality to make a proper assessment … I find it a bit unworthy to push the responsibility on … it all becomes kind of a game...when we finish treatment of patients we push them over to the municipality and so they invent something … but we have to assume that they have increased their number of beds" (chief doctor, orthopaedic ward).

"*It`s expensive to have patients hospitalised when they are determined medically fit … so we try to find solutions for them … thus … sometimes we have to employ second rate solutions"* (nursing home nurse, municipality).

Some hospital nurses expressed that they did not reflect upon the care patients would receive post-discharge. They related this to high patient turnover and work pressure: "*I don't have time to think about the care discharged patients receive … we just have to get them out … .as new arrivals keep coming"* (nurse, medical ward).

Our study results confirm an increase in the number of patient transitions post-discharge due to the measures taken in primary care to increase flexibility (i.e. interim nursing home ward, inter-municipal collaboration agreements). Number of transitions during the post-discharge period (30 days) varied from one to five. For example, a 89 year old female patient was determined medically fit and discharged four days after surgery (treated for hip fracture) to an interim ward in the municipality where she lived. She stayed there for eight days awaiting availability at a primary care rehabilitation ward. One day after arrival at the rehabilitation ward she was re-admitted to hospital due to low haemoglobin percentage. She received blood transfusion and was discharged back to the rehabilitation ward the subsequent day. At 30 days post-discharge her stay at the rehabilitation ward was extended as she was not fit to be sent home.

Multiple transitions after hospitalisation were clearly indicated by all stakeholders (health care personnel, patient coordinators, patients, next-of-kin) to be unfortunate for the elderly. The transitions made patients confused and demobilised: "*It is not right to move us - you get disoriented … suddenly you wake up at night and think: Where am I?"* (patient, female 86 year). Other patients expressed the same feeling: "*It's tiresome to travel from place to place, especially when you are so fatigued … but there is nothing to do about it … Those who do not have any relatives … they must feel incredibly small in this system"* (patient, female 89 year).

A majority of the health care personnel claimed that many transitions were improper for the elderly:

"Several of the elderly get confused by all the transitions … one begins to wonder how beneficial it is … the idea is good … you do get them out of the hospital … the patient is placed there [interim ward] *in anticipation of something else … but it is not ethical … all these transfers"* (patient coordinator, municipality).

"*We clearly see that it's not good for the sick and elderly to change place of residence after three days in hospital … three days at an interim ward and then further on to a short-term stay at a nursing home … they easily get confused … so well … we do see that's not good for them … elderly are vulnerable for delirium … so medically speaking … I do think it's a strain on them … all these transfers … at the same time it's good that they are taken care of*" (general practitioner, municipality).

"If the patient has been at the same ward the entire stay and had the same doctors over a longer period of time … that's safer … then if the patient was being transferred between various wards and sites … and there have been lots of personnel involved … I believe that increases the risk of slips and errors" (doctor, orthopaedic ward).

Next-of-kin expressed despair about their relatives having to be transferred from care site to care site and the stain this system exposed them to. Several also described the post-discharge period as unpredictable, as it all seemed to depend on the current availability in the municipality. This was confirmed by a nurse: *"The process is very unpredictable and it's difficult and frustrating that we cannot give them* [patients and next-of-kin] *answers"* (head nurse, nursing home). A patient also pinpointed the uncertainty as a strain: "*You get anguished by all the uncertainty … uncertainty and insecurity … I think a lot about that … where does it all end?*" (patient, female 89 year).

Health care personnel sometimes referred to the elderly as packages being moved around in the system: "*Perhaps the elderly are becoming more as packages … a piece that is moved around because it's all about the money … and whose responsibility it is to pay … it would be more suitable for elderly to have a stable environment*" (chief doctor, medical ward). Others questioned the patient perspective: *"It's real people you work with, it's not a package that we move from A to B, it's real people … The attention has been towards production, cutting medical waiting lists … sometimes it may go too far … However, patients must proceed in the system as others are waiting"* (chief doctor, orthopaedic ward).

Time efficiency on the day of discharge

It was clearly indicated by hospital personnel that time efficiency during the day of discharge had increased as a result of the increased flexibility in primary care to receive patients. According to primary care personnel it was desirable that patients were discharged during daytime as more resources and competence were then available. It was perceived as challenging and sometimes difficult to contact the hospital after discharge to clarify important issues if the responsible doctor and/or nurse had ended their shift and personnel in the upcoming shift had limited knowledge of the patient. Similar, hospital personnel also expressed that they preferred to transfer patients ready for discharge during day shift in order to safeguard the process and avoid shift handover issues which they referred to as vulnerable. Combined, these issues were suggested to involve an increase in performance and efficiency demands on the day of discharge: "*prior to the reform we had lots of patients on the corridor awaiting availability in primary care nursing homes … now they are rapidly discharged …however, this involves a hectic pace on the day of discharge"* (chief doctor, orthopaedic ward).

The degree of time pressure surrounding a discharge process was primarily determined by the time of day the patient was determined medically fit for discharge. Due to the increase in primary care flexibility for receiving patients, this represented a major shift in discharge practices: "*Previously, we used to notify the municipality* [patient determined medically fit] *and then you could assume that it would take a week … at least … you had all the time in the world to think it* [the discharge] *through and prepare … but now! … now you can receive a phone call barely an hour after you have sent the notification that the patient has been assigned a bed and is ready for transfer … and everything must then be ready … it goes so fast that I think it's almost indefensible …*" (chief doctor, orthopaedic ward). It was clearly expressed that time pressure could represent vulnerability as demands on performance increased: *"It's clear that things can happen a lot faster towards the end of the day"* (head nurse, orthopaedic ward). Similarly: "*It's busy … of course there is an increased chance that you forget something by mistake"* (chief doctor, orthopaedic ward).

Study results further revealed that the time of day a patient was determined medically fit for discharge varied considerably across cases as duration and completeness were determined by multiple factors such as the quality of the discharge planning, number of patients to review and their characteristics, degree of simultaneous responsibilities among the clinical team, degree of familiarity with the inpatients, degree of thoroughness, presence

of sufficient resources, and degree of pressure on available beds. These factors were recognized to be variable across cases affecting and determining the completeness and quality of the medical fit decision.

Hospital nurses stressed the unpredictability of ambulance services describing it as challenging to the discharge planning process. The ambulance services have several responsibilities, i.e. emergency patient transport, sometimes conflicting with the need to transport patients ready for discharge. The ambulance could thus arrive earlier or later than expected depending on availability and priorities. When ambulance services arrived earlier than ordered, this was observed to increase time pressure and stress level on the responsible nurse (i.e. to prepare and coordinate the nursing and medical discharge summaries). Nurses at the orthopaedic wards experienced that the doctors' presence at the wards was unpredictable as they often had simultaneous responsibilities to take care of, resulting in difficulties in preparing a medical discharge summary on time.

The elderly patients occasionally questioned the necessity of rushing the time on the day of discharge: *"It was a rush from the decision that I was ready to be discharged until I was leaving … It was like I had to get dressed and get out"* (patient, female 87 year). Next-of-kin encouraged doctors to spend more time at the patient bedside during the ward rounds at the day of discharge, taking into account the elderly patients' possible impairments and capacities when providing them with the discharge information: *"It can be disgraceful for the elderly when everything has to happen so fast"* (next-of-kin). Hospital personnel experienced that the elderly would complain about the hospital rush on the day of discharge and in general. Even if both patients, next-of-kin and health care personnel questioned the increase in time pressure and efficiency on the day of discharge, they still emphasized the willingness to succeed: "*Everyone that works here is very motivated to make it* [discharge process] *work … the strength is simply that everyone wants and will do whatever they can to do so … It's not about the discharge procedures … the strength is that people are committed"* (chief doctor, orthopaedic ward).

Discussion

This chapter has illustrated how transitional care in the discharge of elderly from hospital to primary care is sustained by local adjustments in the clinical environments involved. To comply with the demands imposed by a health care reform three specific adjustments were applied: (1) Increased level of planning between hospital and primary care; (2) Increased

flexibility in primary care to receive patients; and (3) Increased time efficiency on the day of discharge.

Findings indicate that there is a common agreement (from the perspective of health care personnel across hospital and primary care) that discharge planning has been improved due to the health care reform imposing increased initiatives for dialogue between hospital and primary care. On the other hand concerns are raised relating to the real involvement of patients and next-of-kin in the discharge planning. Substantial variability in how well elderly patients are prepared for and involved in discharge planning prior to the day of discharge is documented in the study. A decrease in delayed discharges was reported after the enforcement of the Coordination reform by both hospital and primary care personnel. Financial incentives and measures to increase flexibility in primary care were primarily appointed as explanatory factors. A decrease in the delayed discharges was perceived as beneficial as it released available beds and resulted in more appropriate use of hospital resources. On the other hand, the current measures to increase flexibility involved a potential increase in the number of patient transitions post-discharge. This entailed an increased demand on coordination between care sites in addition to the mental and physical strain inflicted upon the elderly themselves. An increase in efficiency on the day of discharge was recognized and reported as primary care has increased their flexibility to receive patients on the day they are determined medically fit (in order to avoid paying the daily fee). The discharge process thus has to be performed within a given time span primarily determined by the time of day the patient is determined medically fit. The increase in time pressure and efficiency was recognized by health care personnel to represent vulnerability despite their willingness to obtain successful performance. From a patient perspective the time efficiency on the day of discharge was seen as incomprehensible and the next-of-kin felt it affected the elderly patients' dignity.

Summarising our study displays a multi-faceted picture referring to various outcomes and perspectives as summarized and shown in figure 1.

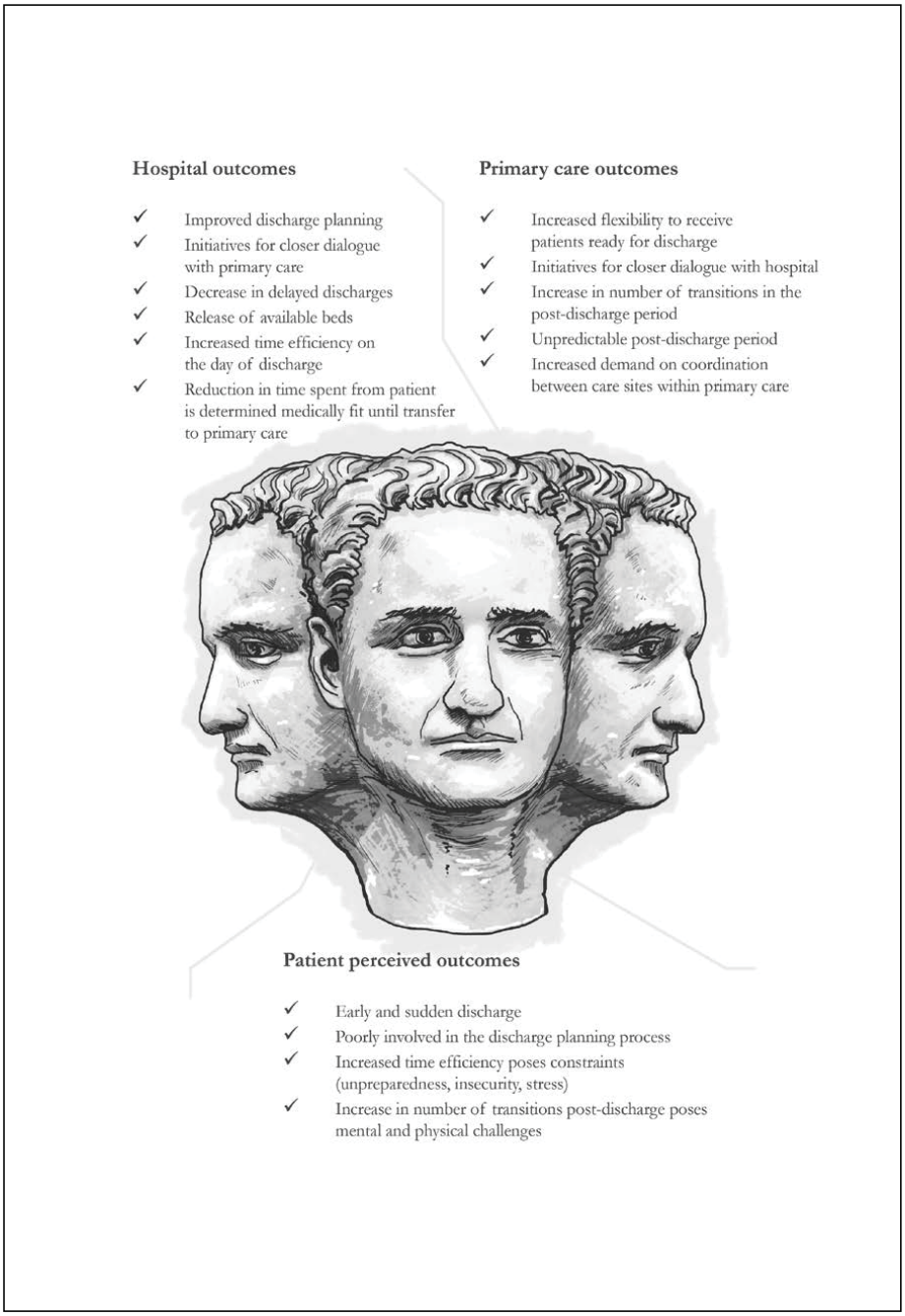

Figure 1: A system reform to improve transitional care: Outcomes and perspectives

Taken from a hospital perspective, outcomes of the adjustments imposed by the reform are perceived mainly as successful. Taken from a primary care perspective, the picture is more nuanced and outcomes are perceived as variable and sometimes problematic. The patient perspective adds further complexity to the multi-faceted notion of outcome of transitional care of the elderly. As our study documents, the adjustments made in order to sustain efficient functioning of the discharge system have in many cases come at the cost of the elderly and their next-of-kin.

In a resilience perspective, we would like to address two main implications from our empirical study: (1) The need for a clarification of the notion of acceptable, successful outcomes; and (2) The need for a clarification of the notion of systems and outcomes.

Clarification of "acceptable, successful outcomes"

Health care resilience definitions seem concerned with the ability of a health care system to succeed under varying conditions to increase the proportion of intended and acceptable *outcomes* (Hollnagel, Braithwaite and Wears, 2013). Such definitions direct attention towards an overall set of system *outcomes*. The multi-faceted Janus (figure 1) illustrates that outcomes can be experienced and viewed from various perspectives (i.e. management, healthcare personnel across hospital and primary care, patient, next of kin). The assessment of acceptable, successful outcomes will thus depend on what stakeholder group your focus is on. This is similar to Waring's (2013) argument that being resilient can mean different things to different groups; that communities and groups will place different values on health care resilience (p. 47). Study results point out that adjustments could be deemed successful from one perspective (i.e. hospital outcomes) but distinct from the viewpoint of others (i.e. patient perceived outcomes). Different outcomes thus represent different judgement of values (Woltjer et al. 2013) that need to be explored and acknowledged in order to be able to share a common ground on what constitute acceptable, successful outcomes.

We argue that health care resilience needs to grasp the multi-faceted Janus as part of its framework. It is also noteworthy that the Janus picture developed in this study will change depending on the perspectives and/or stakeholder groups we might choose to include. As opposed to resilience engineering, the patient perspective further complicates the notion of acceptable, successful outcomes in resilient healthcare. Based on our results, we claim that in clinical environments, the power of definition towards acceptable, successful outcomes is

dominated by and sits with the clinicians, whilst less value has been given to patient reported outcomes and/or patient perceived outcomes. Patient reported outcome measures and/or patient perceived outcomes should therefore be included in the outcome notion at the same level as other outcomes. Gorini et al. (2013) also argue in favour of using patient empowerment to increase personal patients' resilience in addition to contributing to increased resilience in the health care system in general (p.187). We would go even further and claim that the patient perspective is a prerequisite for health care resilience and should be integrated in a commonly shared process of defining acceptable, successful outcomes.

Clarification of "systems and outcomes"

Even though our conception of a health care system would include the patient perspective as argued above, a further clarification of the system notion or boundaries is in our view necessary for the health care resilience debate. So far, the study of resilience in health care has involved understanding the system without reference to any specific boundaries or definitions of a system. Cook (2013) claims that the goal of studying resilience is to understand the system without privileging any single perspective, and to see resilience as a systemic property. Braithwaite et al. (2013) add further to the system debate by characterising health care as a complex adaptive system drawing attention to the importance of defining the system perimeter. In the case of transitional care, the system (beyond the patients) consists of two very broad components, i.e. the hospital and the primary care. We further know that these two components are diverse and entail several sub-systems. Our study has shown that the hospital primary care interconnections create a network across clinical environments or sub-systems with various degrees of interactive complexity. So by arguing for a clarification of the system notion in health care resilience our advice is not to try and define clear-cut system boundaries but instead to focus on interconnections between systems.

As our study has documented, successful outcomes in one sub-system (i.e. the hospital) may create less successful (i.e. primary care) or even poor (i.e. patients) outcomes in other sub-systems. The *time component* also adds complexity to the notion of outcome. The mal-functioning of a patient discharge process may reveal itself time-delayed in another sub-system (i.e. re-admittance of patients, functional and mental decline, adverse events, death). The financial incentives put forward by the reform were perceived to be effective in relation

to achievement of one of its main stated purposes (i.e. namely facilitate rapid discharge and avoid bed blocking). However as a result, it increased complexity of care patterns within primary care as new organisational structures (i.e. inter-municipal collaboration, interim ward) were established to support efficient functioning. Further on it was questioned whether the financial measures could lead to second hand solutions in the receiving municipality to avoid covering costs in the hospital (i.e. they would receive the patient even though the capacity is not present), which in turn represent and potentially create a serious threat to patient safety (Holen- Rabbersvik et al. 2013). Our study findings highlight that reforms and initiatives intended to improve one area of the health service may have unintended consequences in another (i.e. have a positive effect in one system part however affect a different part on the system negatively) (Connolly et al. 2009: Rankin et al. 2013) emphasizing the need to consider both short term and long term consequences (outcomes) when assessing degree of successful achievements, both within and across various systems and sub-systems.

References

Braithwaite, J. et al. (2013). Health Care as a Complex Adaptive System in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). Resilient Health Care. Ashgate.

Coleman, E.A. and Boult, C. (2003). Improving the quality of transitional care for persons with complex care needs. *Journal of the American Geriatrics Society*. 51(4): 556-557

Connolly, M.et al. (2009). Systems and people under pressure: the discharge process in an acute hospital. Journal of Clinical Nursing, 18. 549-558.

Cook, R (2013). Resilience, the Second Story, and Progress on Patient Safety in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). Resilient Health Care. Ashgate

Gorini, A., Mazzocco, K and Pravettoni,. G. (2013). The use of PROMs to Promote Patient Empowerment and Improve Resilience In Health Care Systems in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). Resilient Health Care. Ashgate

Grone, O. and Garicia-Barbero, M. (2001). Integrated care: A position paper of the WHO European office for integrated care services. *International Journal of Integrated Care*. Vol 1.

Holen-Rabbersvik, E.et al. (2013). Important challenges for coordination and inter-municipal cooperation in health care services: a Delphi study. BMC Health Services Research. 13:451.

Hollnagel, E (2012). FRAM: The functional resonance analysis method. Ashgate

Hollnagel, E., Braithwaite. J., Wears, R. (2013). Resilient Health Care. Ashgate.

Majeed, U. M.,et al. (2012). Delay in discharge and its impact on unnecessary hospital bed occupancy. *BMC Health Services Research*

Norwegian Ministry of Health and Care Services (2009). Coordination reform" Proper treatment – at the right place and right time". Report no 47 to the Storting. Short version in English available from: http://www.regjeringen.no/upload/HOD/Dokumenter%20INFO/Samhandling%20engelsk_PDFS.pdf

Rankin, A. et al. (2013). Resilience in Everyday Operations: A Framework for Analyzing Adaptions in High-Risk Work. Journal of Cognitive Engineering and Decision Making.

Waring, J. (2013). What safety-II Might Learn from the Socio-cultural Critique of Safety-I in Hollnagel, E., Braithwaite. J., Wears, R. (Eds). Resilient Health Care. Ashgate

Woods, D.D., Patterson, E.E. and Cook, R.I (2006). Behind Human Error: Tamping Complexity to Improve Patient Safety. In P. Carayon (ed.), Handbook of human factors in healthcare. Erlbaum (pp455-472).

Woltjer, R. et al. (2013). Resilience Engineering in Air Traffic Management. Increasing resilience through safety assessment in SESAR. SESARWPE. Long term and innovative research

World Health Organization (WHO) (2008). Integration of health care delivery: report of a study group. Geneva Switzerland: Integrated health services – what and why? Technical Report series, No. 861

Appendices

Appendix 1: Information to patient and next of kin including consent form

Appendix 1: Information to patients and next of kin including consent form

INFORMATION TO PATIENTS AND NEXT OF KIN

Invitation to participate in research project

Background information

We would like to invite you to participate in the research project "Quality and safety in transitional care of the elderly." This research project will focus on quality and safety in treating, tending, and caring for elderly patients across municipalities and hospitals. The study will focus on how quality and patient safety is addressed when admitting and discharging elderly patients from hospitals and municipal health services (nursing homes or their own homes with home nursing care). We have provided information below on why this research is being carried out and what this means for you as a potential participant in the project.

What is the aim of the project?

The main aim of this project is to shed light on the distinguishing features of successful transitions between hospitals and the municipal health services in connection with admission and discharge of elderly patients, and to develop practical solutions that are in the best interest of patients, next of kin, and healthcare providers.

Who will be invited to participate?

The research project will use elderly patients (>75 years) who were admitted or discharged with: a medical condition or hip fracture in combination with polypharmacy (>5 medications daily). Patients' next of kin may also be used in the research project, given that the patient has provided their consent.

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Why participate and what does participation entail?
You are welcome to participate in this research project if you are:

- A patient over 75 years of age who was admitted or discharged from a hospital with a medical condition or hip fracture and who takes more than five medications daily.

- A patient's next of kin over 75 years of age who was admitted or discharged from a hospital with a medical condition, hip fracture, or dementia and who takes more than five medications daily.

Participating in this study means that members of the research team will follow you and your interactions with the healthcare providers either when being admitted or on the day that you are discharged from the hospital. By participating in the study, you accept that the research team is able to access and make copies of your admittance and discharge information. We would like to emphasize that no personally identifiable information will be recorded or used.

We would also like to visit you at your nursing home or at your own home following discharge to talk to you about the discharge process. Central themes in our discussion with you as a patient or next of kin will be your experiences related to your participation, involvement, and access to information in relation to your hospital stay and discharge. The conversation will last for approx. 10-20 min.

Participation in the research project is voluntary

Participation in this research study is voluntary and you will have the option to withdraw during the course of the study if needed. All information gathered are confidentially. Anything relevant to the observation and discussions will be assigned a code to ensure confidentiality and will be stored in a locked filing cabinet or in a password protected computer that is protected from unauthorized access. When presenting information material during research work, the research team is obligated to uphold their duty of confidentiality so as to maintain anonymity. All information material will be made anonymous in all reporting from the study. The expected end date for the project is December 31, 2015.

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Appendix 1: Information to patients and next of kin including consent form

Why participate and what contributions do you make as a participant?

Improving cooperation between hospitals and the municipality is regarded as a significant and important task. For this kind of work, it is vital to obtain information about patients' and their next of kin's personal experiences connected with their interactions with hospitals and the municipal health services.

More information

Thank you for taking the time to read through this information. If anything is unclear or you would like additional information about this project, you may call or email us at:

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DECLARATION OF CONSENT

I confirm that I have received, read, and understood the information provided about the research project "Quality and safety in transitional care of the elderly" and agree to participate in this project.

	YES	NO
I agree to participate in this research project	☐	☐

Please sign with initials in the boxes	**YES**
By signing, you are saying:	☐
to the research team making copies of your discharge letter	☐
to the research team contacting your next of kin	☐
to the research team contacting your coordinator in the municipality	☐
to the research team contacting the home nursing care up until 30 days after discharge	☐
to the research team contacting your family doctor following discharge Up until 30 days after discharge	☐

Name of participant: …… Date…….

Signature …….

Name of researcher: ……...

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Appendix 2: The observation guide applied in the PhD study

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OBSERVATION GUIDE: DISCHARGE

CONTEXT	PATIENT	HEALTH PERSONNEL	HEALTH PERSONNEL
Day/date:	Code: Age:	Position:	Position:
Time of day:	Diagnosis: Additional diagnoses: Cognitive impairment: Function level: (Before/After)	Work experience:	Work experience:
Time spent:	Number of medications:	Gender, age:	Gender, age:
Place for observation (department):	Social network(next of kin):	Position:	Position:
Researcher:	Admitted by: Discharged to:	Work experience:	Work experience:
Co-observer:	Length of hospital stay:	Gender, age:	Gender, age:

*Describe what happens on the day of discharge. Do not add interpretations to what is observed.

Appendix 2: The observation guide applied in the PhD study

PART 1: OBSERVATION AT THE HOSPITAL ON THE DAY THE PATIENT IS DISCHARGED TO FOLLOW UP CARE IN MUNICIPAL SERVICES

- Structures/plans

Are there any special discharge procedures?	
Are these being applied? (Degree of compliance)	
Failure in procedures?	

- Coordination with the municipal health services (discharge planning)

How long after admission were the municipal health services contacted?	
How many times during the hospital stay has the department been in contact with the municipal health services and who have they been in contact with?	
When were the municipal health services informed about the discharge?	
Is there any contact between the hospital and the municipality on the discharge day? Who is in contact with whom?	

- Discharge conversation with the patient & patient involvement

How is this organised? (time, place, room)	
Who is present?	
What information is the patient getting/receiving?	
Is the information suited to the patient? (use of professional jargon, clear, unclear,)	
Are the patient informed of any medication changes and the reasons for these? (Side-effects, administration etc.)	

Appendix 2: The observation guide applied in the PhD study

Are the patient informed about plans for follow-up care and rehabilitation? What information is given?	
Are the patient given the opportunity of stating what he/she considers important?	
How informed does the patient appear to be in relation to; (Hospital stay, diagnoses, medications, plans for follow-up etc.)	

Interdisciplinary cooperation – holistic approach

Which professional groups are involved in the discharge process?	
How does the interdisciplinary cooperation function? (how much dialogue, what does it contain)	
What is the nurse's role in the discharge?	
What is the physiotherapist's role in the discharge?	
What is the doctor's role in the discharge?	
Has the patient been assessed by a geriatrician during the hospital stay and/or in connection with the discharge?	

- ## Documentation and information transfer

Is the discharge summary and nurse record present on discharge?	
Is this being sent electronically and /or with the patient on discharge?	
Is there a rehabilitation plan upon discharge? Clear guidelines connected to rehabilitation, recommended exercises?	
Has the nursing process been taken care of during the hospital stay and handed off on discharge? Mapping of nursing requirements and measures Overall picture of the patient's situation (picture of nutritional state, cognition/ nutritional state, cognition/delirium, medicines, pains, infection, fall risk, activity, elimination etc)	
Is the patient involved in the preparation of the nursing plan that will follow on discharge?	

Appendix 2: The observation guide applied in the PhD study

- Coordination with next of kin

Has the patient next of kin, a social network? Who does this consist of?	
Are the next of kin involved/contacted on the day of discharge?	
What information do the next of kin receive? Who informs them?	
Are the next of kin informed of any changes in medication during the hospital stay/upon discharge and plans for the rehabilitation and exercise? What information is being given?	
Has next of kin been given the opportunity of stating what they consider important for the patient to manage after discharge?	

- Factors affecting the discharge process

Result

- Is the discharge proceeding as planned?
- Success criteria and obstacles

Delays?	
Does the patient seem satisfied with the discharge?	
Obstacles and opportunities for improvement in the discharge process	
Risk elements/failures in procedures Unwanted incidents?	

Summary from responsible nurse/licensed practical nurse/practical nurses

How did you experience this discharge process? **(weaknesses/strengths)**

Summary from responsible doctor

How did you experience this discharge process? **(weaknesses/strengths)**

Appendix 2: The observation guide applied in the PhD study

PART 2: FOLLOW UP BY THE MUNICIPAL HEALTH SERVICES 1-2 DAYS AFTER DISCHARGE

Focus of the observation:

Level of care (e.g. nursing home or home care services)	
Readmission to the hospital during the follow-up period?	
Number of transitions during the follow-up period?	
Experiences of the stakeholders involved: 1. *Conversation with the patient 2. *Conversation with next of kin 3. *Conversation with receiving nurse 4. *Conversation with the doctor responsible for the patient	

*** Conduct conversations with the patient, their next of kin (if enrolled), and healthcare personnel with respect to each transfer that the patient experiences during the follow-up period.**

Appendix 2: The observation guide applied in the PhD study

Conversation with the patient post-discharge

Code:	
Time and place:	
Time spent:	

1. DISCHARGE PROCESS AND DISCHARGE PLANNING

    - Ask the patient to describe their experience of the hospital stay and the discharge process – map the degree of satisfaction (why/why not)
    - Prepared/unprepared (anxiety/fear) – ready for discharge?

2. PATIENT INVOLVEMENT

    - Map the degree of involvement

        ✓What kind of involvement
        ✓Degree of adequacy experienced

3. INFORMATION TRANSFER

    - What information did the patient receive?

        ✓Was it well-adapted, easy to understand?
        ✓Was there any information missing? Too much, too little, adequate?
        ✓What kind of information does the patient consider to be important?
        ✓Did the patient experience that the receiving care providers was adequately informed of the patient's condition on discharge, changes, rehabilitation and training etc.?

4. AREAS OF IMPROVEMENTS

    - What was good?
    - What could have been better?

Appendix 2: The observation guide applied in the PhD study

Conversation with next of kin post-discharge

Code:	
Time and place:	
Time spent:	

DISCHARGE PROCESS

- Ask the next of kin to describe their experience of the hospital stay and the discharge process – map the degree of satisfaction (why/why not?).
- Prepared/unprepared– ready for discharge – when were you informed of the discharge?

2. INVOLVEMENT OF NEXT OF KIN
   - Map the degree of involvement
     - ✓what type of involvement
     - ✓degree of satisfaction

3. INFORMATION TRANSFER

   - What information did the next of kin have?

     - ✓Was this adapted, easy to understand?
     - ✓Was any information missing, too much, too little, adequate?

4. AREAS OF IMPROVEMENT

   - In the perception of the next of kin, did anything go wrong during the discharge process?
   - What was good?
   - What could have been better?

Appendix 2: The observation guide applied in the PhD study

Conversation with receiving nurse

Code:	
Time and place:	
Time spent:	

1. DISCHARGE PROCESS

    - Ask the nurse to describe their experience of the particular discharge process of patient NN

2. INFORMATION TRANSFER

    - Map the degree of satisfaction with the information transfer

        ✓ Strengths and weaknesses of the nursing record
        ✓ Map the information the nurse considers important to find about a patient such as NN – find out if this exists
        ✓ Could the nurse identify/assess the patient's nursing needs based on the nursing record available at discharge?
            1. Does this provide an overall picture of the patient's situation?
            2. Is the information on rehabilitation and training adequately described?
            3. Is the information on medicines – changes etc adequately described?

3. AREAS OF IMPROVEMENTS
    - What was good?
    - What could have been better?

Appendix 2: The observation guide applied in the PhD study

Conversation with the receiving doctor

Code:	
Time and place:	
Time spent:	

1. DISCHARGE PROCESS

- Ask the doctor to describe his/her experience of the particular discharge process of patient NN

2. INFORMATION TRANSFER/COORDINATION WITH THE HOSPITAL

- Map the degree of satisfaction with the information transfer (Discharge letter)
  - ✓ Strengths and weaknesses
  - ✓ Was the discharge letter received within seven days of discharge?
  - ✓ Could the doctor identify/assess the patient's need for medical treatment, rehabilitation and follow-up based on the discharge letter available?

3. AREAS OF IMPROVEMENT

- ✓ What was good?
- ✓ What could have been better?

Appendix 3: Example of functional description

Appendix 3: Example of functional description

Function	Aspect	Description of aspects	Description of variability
Review of hospital inpatients – classify patients that are medically fit for discharge	Input	The physician/senior doctor responsible for the ward- round has arrived the hospital ward in the morning. Clinical care of hospital inpatients are reviewed (and the need for further treatment/plans are decided upon)	Normally, a preparation activity takes place in form of a pre-ward round. This activity appears as a clinical process where the clinical care of hospital inpatients are reviewed. The doctor reviews patient`s progress and results of investigations and determines whether further steps are necessary (without consulting the patient). The pre-ward rounds are normally multidisciplinary including lead consultant, interns and junior doctors, responsible nurse (primary nurse or team nurse depending on the nursing care model applied at the ward). At some wards the head nurse also attends the pre-ward rounds, depending on how it is organized. At some wards, especially the orthopedic/surgical wards physiotherapists normally attend pre- ward rounds ones a week. It varies to some extent when pre- ward round is carried out. There are also temporal differences concerning time spent performing the function depending on a number of factors such as: number of patients to review, degree of familiarity with patients (continuity of care), patient characteristics and complexity of care, issues to be solved and clarified, degree of interruptions during the review, and doctors' degree of thoroughness while performing the function. Care continuity is furthermore related to consistency of staff (the number of doctors involved in the patients' care). During several cases doctors and nurses were not familiar with the patients. When doctors expressed this concern they often required a thorough review. In one ward, neither the patients' primary nurses nor team nurses attended the pre- ward round. The appropriateness for discharge is/seems determined by the absence of an acute health condition where on-going diagnostic or therapeutic intervention or monitoring is no longer required. The responsible doctor (for the ward round) reviews patient progress against anticipated progress based on examination, observations, investigation results (e.g. test results) to determine whether the patient is medically fit for discharge. It varies when and how the decision is determined as the function depends on output/inputs from several upstream functions and is based on a number of factors: (1) Individual assessment by the responsible doctor at the ward; (2) Input from nurses, physiotherapists and others involved; (3) Available lab/test results to guide the assessment; (4) The degree of pressure on available hospital beds. Based on these factors an overall evaluation is needed prior to a final decision. The function furthermore depends on resources and execution conditions while it is carried out which might affect
	Output	Patients are determined medically fit for discharge (or not)	
	Time	Carried out each morning (doctors arrive the wards after a morning meeting with fellow colleagues), normally at 9 am (but variable). Takes place during the pre-ward rounds (performed prior to the ward round). Time factors: • Number of patients to review (patient characteristics, complexity of care, issues to be solved). • Degree of simultaneous responsibilities (doctor on call, interruptions, time to review inpatients, urgent matters). • Degree of familiarity with patients at the ward • Degree of thoroughness • Updated lab/test results not available when hospital inpatients are reviewed (may postpone decision). • Degree of thoroughness • Pressure from management, head nurses or senior doctors	
	Control	Is a main part of (daily agenda) the doctors' schedule and responsibility. Individual assessment, guidelines for assessment (regulations). Part of the ward lead consultant's responsibility (instructions). Expectations from management.	
	Resources and execution conditions	Information: Patients' medical records, lab results, medications. The patient`s journal. Updated patient info. Inputs from responsible nurse. Updated info on ADL (activities on daily living), depending on the nurse's familiarity with the patient (depending on care continuity, consistency of staff). Available and sufficient documentation justifying medical decisions, treatment and plans during the hospital stay. Dialog with the municipality (according to co-operation agreement). Interaction/ collaboration between healthcare personnel Tools: Computer access Competence: Responsible physicians/doctors, inputs from patients' primary nurse, team nurse, others	

Appendix 3: Example of functional description

	Precondition	Updated and sufficient information about the patient. Doctor's consultation with care team (responsible nurse, others). Lab/test results, results of investigations to guide the assessment/decision. Distinctive for Hip fracture patients: • X-ray after surgery confirming patient mobilization • Patient mobilization carried out	the outcome and temporal affect the function. There is variability in the function explained by differences in doctors' work practices and competencies that affects the output: • Individual preferences related to the criteria doctors build their decision upon (to determine if and when a patient is ready for discharge). This seemed especially to be the case for hip fracture patients. • Degree of thoroughness. • Knowledge of the patient and competence. In some cases, the responsible doctors expressed that they needed to consult with senior doctors if they were not familiar with the patient or if they were uncertain. A preliminary decision could be made during the pre-ward round, as some doctors (but not all) wanted to talk to the patient before making their final decision. • Doctors had different emphasis on involving and consulting with the patient before their decision. • Doctors had different preferences for dialogue with the patient care team, especially nurses. The degree of teamwork, dialogue, trust, and inter-professional competence affected the knowledge-sharing positively or negatively. Nurses (and others) involved in patient care were to varying degrees invited to speak up or had the courage to do so (dependent on work experience, relation-ship with the doctor). • In several cases, doctors had experiences with pressure from senior doctors, head nurses or management to discharge patients (dependent on crowded wards, availability of hospital beds).

Appendix 4: Example of interview guide applied in the PhD study

Appendix 4: Example of interview guide applied in the PhD study

Interview guide: Nurses – specialist health services (discharge)

Introductory questions:

Age:

Gender:

Position:

Work experience/practice:

How long have your worked in this department?

Patient ready for discharge

1. How will you define a patient that is ready for discharge?
2. Do you experience that the hospital and municipal health care services agree on what a patient ready for discharge is and the time of discharge?
3. When do you begin to make plans/prepare for the discharge (e.g. discharge planning)?
4. As nurses, what do you consider are the important conditions to assess before elderly patients are discharged to the municipal health services?

Cooperation /coordination between the hospital and the municipality

1. How would you generally describe the cooperation/coordination between the hospital and the municipality in connection with the discharge of elderly patients?
    a. What works well/what works less well?
    b. If you could choose one challenge, from your perspective, that prevents/undermines coordination/cooperation, what would it be?
2. Do you experience a difference in coordination related to larger versus smaller municipalities – geographical distances?

Appendix 4: Example of interview guide applied in the PhD study

   a. Do you experience that it is easy to contact the municipal health services for dialogue about the discharge?

3. What do you consider are the success criteria for good coordination between the hospital and municipality in relation to the discharge? (Which factors do you feel are crucial and necessary to creating a good cooperation climate across the specialist and primary health services?)

4. Are there established procedures to ensure good coordination with regard to the discharge of elderly patients?

   a. How do you experience that these function in practice?

   b. How will you assess the discharge procedure – in which way do you experience that this has contributed to better cooperation/coordination with the municipality?

5. Are you familiar with the contents of the partial agreement approved between the hospital and the municipality in relation to cooperation regarding patients ready for discharge?

6. Have you knowledge of coordination arenas established between the hospital and the municipality – do you know if there are formalized, regular meetings at leadership level between the hospital and the municipality?

7. How do you experience that the framework conditions support good coordination (structural and financial)?

8. What do you think about the coordination reform?

   a. How do you think it will contribute to promoting/improving coordination between primary and specialist health services?

   b. Have you experienced changes in the cooperation/coordination between hospital and local authority since the coordination reform was implemented in January this year?

Hospital discharge and patient safety

1. Are you familiar with the concept of patient safety and can you describe in your own words what this concept means to you?

2. In light of what you have just said – what do you think is important in order to safeguard/promote patient safety during hospital discharge? How would you describe a safe and secure patient transfer?

   a. Is it your experience that discharge can be associated with risk?

   b. How would you describe a risky patient transfer? Is it your experience that discharge of elderly people is associated with risk?

3. Research suggests that elderly patients are a patient group with a higher risk of adverse events during transfer/discharge. Do you share that perception – and if so, why do you think this is the case?

4. Is it your experience and belief that elderly people are given less priority as a patient group? (And if so, is this something that can increase risk for this patient group?)

Appendix 4: Example of interview guide applied in the PhD study

5. Have you personally experienced that elderly people have suffered adverse events as a result of lack of coordination?
    a. Can you describe this process and which factors contributed to causing the adverse event?
6. Would you say that some situations/days are higher risk than others associated with the discharge of elderly patients? (Which and why?)
7. To what extent do you agree with the statement that lack of coordination increases the risk of adverse events?

Care documentation and information transfer

1. Are there good procedures/systems in place to ensure good information exchange between the hospital and the municipality during hospital discharge of the elderly? Can you describe how this functions?
2. What information is contained in a good nursing care summary? What information is important to transfer to municipal health care services?
3. What value do you consider the written documentation has during discharge?
4. On a general basis, is it your experience that there is at any time sufficient patient care documentation about treatment and assessments done in order to write a good patient case summary?
5. Do you have any thoughts on how we can ensure better information transfer?
6. What kind of dialogue do you have with the municipality before discharge?
7. Research has shown that the nursing-related patient care information transfer can be deficient on discharge – what thoughts do you have about this?
    a. What focus do you have on nursing-related patient care information on discharge?
8. How do you think electronic solutions can improve coordination?

Patient participation and next of kin involvement

1. How would you describe the cooperation and involvement with the elderly patient in the process associated with discharge?
    a. Can you describe the cooperation – your experience and perceived challenges?
    b. Is it your experience that they are involved to a sufficient extent? (Or if not, why not?)
    c. Why do you think it is important/not so important to involve patients?

Appendix 4: Example of interview guide applied in the PhD study

d. What information do you consider it important to give patients on discharge?

2. How would you describe the cooperation with the next of kin/relatives in the process associated with discharge?

    a. Can you describe the cooperation – your experience and perceived challenges?

    b. Is it your experience that they are involved to a sufficient extent? (Or if not, why not?)

    c. Why do you think it is important/not so important to involve the next of kin/relatives?

    d. What information do you consider it important to give to relatives/next of kin on discharge?

Multi-disciplinary teamwork and team performance

1. Which occupational groups/professions are often involved in discharge of elderly patients to follow up care in municipal health and care services?

    a. What is your experience of how the communication and coordination/teamwork between the different occupations/professions works/functions in your ward? (What works well/does not work?)

    b. Have you experienced failure of communication between different occupations/professions in connection with discharge? (Provide examples if you can.)

        i. What do you think is the reason for the failure in communication?

2. What do you think is the importance of cross disciplinary coordination for the discharge of elderly patients?

3. How is good multi-disciplinary teamwork/coordination facilitated in your ward?

Finally: How can we ensure a good hospital discharge process of the elderly to follow-up care in municipal health and care services?

Are there other important issues that you feel are important to highlight in this context/study, which we have not touched on / or something you would like to add to what we have talked about?

Appendix 5: Invitation to participate in interviews

Appendix 5: Invitation to participate in interviews

INFORMATION TO HEALTHCARE PROVIDERS

Invitation to participate in a research project

Background information

We would like to invite you to participate in the research project "Quality and safety in transitional care of the elderly." This research project will focus on quality and safety in treating, tending, and caring for elderly patients in the interface between primary and specialist health services. The study will focus on how quality and patient safety is addressed when admitting and discharging elderly patients from hospitals and municipal health services (nursing homes or their own homes with home nursing care). We have provided information below on why this research is being carried out and what this means for you as a potential participant in the project.

What is the aim of the project?

The chief aim of this project is to shed light on the distinguishing features of good transferral and cooperation between hospitals and the municipal health services in connection with admission and discharge of elderly patients, and to develop practical solutions that are in the best interest of patients, next of kin, and healthcare providers.

What kind of elderly patients will be included in the research project?

The research project will use elderly patients (>75 years) who are admitted or discharged with: a medical condition or hip fracture in combination with polypharmacy (>5 medications daily). Patients with dementia may be also be used who are admitted or discharged from the hospital with the diagnoses mentioned.

Who is funding and responsible for the project?

This research project is being conducted by the University of Stavanger (UiS) by two doctoral students Kristin Alstveit Laugaland (employed at Helse Førde), Dagrunn Nåden Dyrstad (employed at UiS), postdoctoral researcher Marianne Storm (employed at UiS), and project manager and professor Karina Aase from UiS. This research project is funded by the Research Council of Norway, the Western Norway Regional Health Authority, and the University of Stavanger. Helse Førde and the Regional Center for Elderly Medicine and Coordination (SESAM) are formal partners in this research study. The study received approval from the Regional Committees for Medical and Health Research Ethics (REC) on October 19, 2011, reference number 1978.

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Why participate?
Your hospital or municipality has agreed to take part in the study, and we are inviting some of their employees to participate in several ways (see below).

In what ways can I get involved?
If you would like to participate in this research project, this will involve sharing your points of view and experiences on the current practices related to cooperation during admittance and discharge from hospitals between primary and specialist health services. You are invited to participate in two different ways:

Observation: Participation in the study means that we will follow/observe you and your interactions with patients and other healthcare providers on the day that the patient is admitted or discharged from the hospital to the municipal health service (nursing home or their own home). Participating in an observation will be based on given spoken consent.

Interview: We are going to invite a number of employees to participate in interviews with members of the research team. If you receive an invitation and agree to participate in an interview, it will take around 45 min. We would like to record the interviews so that we can get an accurate overview of what you tell us. We will also ask you to sign a consent form where you agree to participate in the interview.

Participation is voluntary and will be kept confidential
All participation in this research study is voluntary and you will have the option to withdraw during the course of the study if needed. All information gathered will be treated as confidential. Anything relevant to the observation, discussions, and interview will be assigned a code to ensure confidentiality and will be stored either in a locked filing cabinet or in a password protected computer that is protected from unauthorized access. When presenting information material during research work, the research team is obligated to uphold their duty of confidentiality so as to maintain anonymity. All information material will be made anonymous in all reporting from the study. The expected end date for the project is December 31, 2015.

Why participate and what contributions do you make as a participant?
Improving cooperation between primary and specialist health services is regarded as a significant and important task. For this kind of work, it is absolutely necessary to obtain information about healthcare provider's personal experiences connected with their interactions with hospitals and the municipal health services. We hope that you will be interested in participating and also hope to receive your positive feedback. It is entirely up to you to decide whether or not you would like to participate. If you choose to participate, we ask that you please fill out the attached declaration of consent.

More information
Thank you for taking the time to read through this information. If anything is unclear or you would like additional information about this project, you may call or email us at:

Kristin Alstveit Laugaland (Research Fellow)
kristin.a.laugaland@uis.no
Phone: 51834141 Cell: 98486261

Karina Aase (Project Manager)
karina.aase@uis.no
Phone: 51831534

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Marianne Storm (Postdoctoral Researcher)
marianne.storm@uis.no
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Faculty of Social Sciences
Department of Health Studies
Kjell Arholm's House

University of Stavanger
4036 Stavanger

Phone: 51 83 10 00
Fax: 51 83 10 50
Email: post@uis.no
www.uis.no

Appendix 5: Invitation to participate in interviews

DECLARATION OF CONSENT

INTERVIEW WITH EMPLOYEES

Names of the researchers from the University of Stavanger who may conduct interviews: Dagrunn Nåden Dyrstad, Kristin Laugaland, Lene Schibevaag, Heidi Nedreskår, Marianne Storm, Karina Aase.

I confirm that I have received, read, and understood the information provided about the research project "Quality and safety in transitional care of the elderly" and agree to participate in this project.

YES **NO**

I agree to be interviewed:

Name of participant: …… Date:…….
Signature:

Name of researcher: …… Date:…….
Signature:

If you choose not to participate, we ask that you please provide a brief explanation as to why you would not like to take part in this study:

Faculty of Social Sciences
Department of Health Studies
Kjell Arholm's House

University of Stavanger
4036 Stavanger

Phone: 51 83 10 00
Fax: 51 83 10 50
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Appendix 6: Ethical approval

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UNIVERSITETET I OSLO

DET MEDISINSKE FAKULTET

Karina Aase
Institutt for helsefag
Universitetet i Stavanger
4036 Stavanger

Regional komité for medisinsk og helsefaglig forskningsetikk Sør-Øst B (REK Sør-Øst B)
Postboks 1130 Blindern
NO-0318 Oslo

Telefon: +47 22 84 55 14

E-post: post@helseforskning.etikkom.no
Nettadresse: http://helseforskning.etikkom.no

Date: 25.02.2013
Your ref.:
Our ref.: IRB00006244

To whom it may concern

With regards to the study *Quality and safety within elderly health and care services - the role of transitions and interactions.*

We hereby confirm that the Regional Committee for Medical and Health Research Ethics, section South-East C, Norway, has approved the project *Quality and safety within elderly health and care services - the role of transitions and interactions.* (Norwegian title: *Kvalitet og sikkerhet knyttet til overføring av eldre pasienter, 2011/1978b).*

The project was approved on the 11th of November 2011.

The ethics committee system consists of seven independent regional committees, with authority to either approve or disapprove medical research studies conducted within Norway, or by Norwegian institutions, in accordance with ACT 2008-06-20 no. 44: Act on medical and health research (the Health Research Act)

Please do not hesitate to contact the Regional Committee for Medical and Health Research Ethics, section South-East B (REK Sør-Øst B) if further information is required.

Yours sincerely,

Stein Oppjordsmoen Ilner MD, PhD
Professor of Medicine,
University of Oslo

Chair, Regional Committee
for Medical and Health Research Ethics,
section South-East B

Hege Holde Andersson
Advisor

Regional Committee for
Medical and Health
Research Ethics, section
South-East B