Are patients discharged with care?

Cultural barriers and appropriate interventions

Gijs Hesselink

Are patients discharged with care?

Cultural barriers and appropriate interventions

For reasons of consistency within this thesis, some terms have been standardized throughout the text. As a consequence the text may differ in this respect from the articles that have been published.

The studies presented in this thesis have been performed at the Scientific Institute for Quality of Healthcare (IQ healthcare). This institute is part of the Nijmegen Centre of Evidence Based Practice (NCEBP), one of the approved research institutes of the Radboud University Nijmegen Medical Centre.

The studies described in this thesis, except for chapter 2, were supported by a grant from the European Union, the Framework Programme of the European Commission (FP7-HEALTH-F2-2008-223409).

Financial support by the Scientific Institute for Quality of Healthcare (IQ healthcare) for the publication of this thesis is gratefully acknowledged.

ISBN: 978-90-76316-826

Nijmegen, 2013

Cover design: Justin Spel/ European HANDOVER Research Collaborative
Lay-out: Jolanda van Haren/ Gijs Hesselink
Print: GVO drukkers en vormgevers B.V. | Ponsen & Looijen, Ede

Are patients discharged with care?
Cultural barriers and appropriate interventions

Proefschrift

ter verkrijging van de graad van doctor
aan de Radboud Universiteit Nijmegen
op gezag van de rector magnificus prof. mr. S.C.J.J. Kortmann,
volgens besluit van het college van decanen
in het openbaar te verdedigen op woensdag 4 september 2013
om 10.30 uur precies

door Gijs Jan Hesselink

geboren te Hengelo op 22 december 1982

Promotor:	Prof. dr. M.J.F.J. Vernooij-Dassen
Copromotoren:	Dr. L. Schoonhoven Dr. H.C.H. Wollersheim
Manuscriptcommissie:	Prof. dr. D.D.M. Braat Prof. dr. F.P.J. Wester Prof. dr. F.G. Schellevis (UvA)

Contents

Chapter 1

General Introduction

Hospital discharge and its increased importance

The handover of a patient's care is a critical, 'high-risk' episode in the care process of many patients[1,2]. Particularly when care requires close cooperation between healthcare professionals across organizational boundaries, thereby forming an interdisciplinary network[3] or a 'clinical micro system'[4,5]. Patient handovers between hospital and primary care are an increased concern for healthcare professionals and policy-makers considering the trend towards shorter hospital stays and the provision of more care in the community[6]. Moreover, during the past several years, transitions in care have become more frequent and complicated, especially for the elderly and very young. They are part of a vulnerable group as high-risk patients with dependencies and often multiple comorbidities[2]. Patients are also required to carry more responsibilities themselves, presenting new challenges for patients and their families as they return home[7]. These circumstances result in a great risk for errors and possible adverse events. Therefore, high-quality discharge has become more important than ever.

The problem of hospital discharge

Health problem and costs

Despite its growing importance, hospital discharge is often poorly executed and seriously impedes the quality and safety of patient care. Forster et al.[8,9], demonstrated that one in five patients experience an adverse event after being discharged. Approximately 62% of these adverse events could have been either prevented or ameliorated, ranging from serious laboratory abnormalities to permanent disabilities and life threatening situations. Inadequate handovers at hospital discharge also lead to avoidable treatments, unanticipated readmissions[10,11], and overcrowding of Emergency Departments[12]. Studies by Halfon et al.[13], and Jencks et al.[14], showed that one month hospital readmission rates vary between 13% and 20% of which around 15% were preventable. Unnecessary hospital readmissions also lead to a considerable amount of extra costs. Friedman and Basu[15], reported that hospital cost for preventable readmissions during 6 months follow-up was about 730 million US dollars. In a study by Jencks, total hospital costs were estimated at $44 billion per year for rehospitalizations within 30 days of hospital discharge[16].

Quality and safety deficits

Stimulated by these severe consequences, interest into the challenges to effective and safe patient care in the discharge process has rapidly increased the last decennia. This interest was further triggered by the Institute of Medicine (IOM) report "To Err is Human". This report suggested that up to 70% of the estimated 98,000 lives lost each year result from medical errors and that poor transfers of care are especially prone to such failures[17].

Adverse events due to suboptimal discharge are often related to poor quality of information exchange, coordination of care and communication between hospital and community care providers and between healthcare providers and patients or their relatives. For example:

1. Discharge reports often fail to provide important administrative and medical information, such as relevant data about diagnostic findings, details about the hospital course, treatment, complications, consultations, tests pending at discharge, and arrangements for post-discharge[18]. Furthermore, for more than two-third of the patients, their GP have not received a written discharge report by the time of the first post-discharge visit. For one-quarter of the patients, their GP will never receive one[19-21].
2. Patients and relatives in the discharge process appear to be often poorly informed. A large national survey of hospital care revealed that only 50% of patients with congestive heart failure received written instructions at the time of discharge[22]. Other studies have demonstrated that most patients do not know their discharge diagnosis[23] and misunderstand the use of new medications[24,25].
3. Medication errors in the period following hospital discharge represent a large portion of the adverse events experienced by patients[26]. In a recent study by Kripalani et al.[27], almost half of the studied patients experienced post-discharge medication errors. Other studies showed, that discharge medications make up almost half of all hospital medication errors.
4. Direct communication between hospital physicians and primary care physicians during the discharge process occurs infrequently[18]. In a study by Meara et al.[30], only 3% of the GPs reported being involved in discussions about discharge. Findings of Isaac et al.[31], and Pantilat et al.[21], show that 17% to 33% of the GPs are always notified about discharges.
5. Non-completion of recommended outpatient workups after hospital discharge is common. Nearly one third of the discharged patients had outpatient workups recommended by their hospital physicians, of which 35.9% were not completed[32].

Insufficient insight in the underlying discharge barriers

Although the knowledge about (un)safe and (in)effective hospital discharge has rapidly increased since the last decennium and studies have provided ample evidence on the adverse consequences of suboptimal discharge, insight in the social behavioral root-causes is limited. A first assumption underlying the content of this thesis is that in assessing quality and safety of hospital discharge, aspects of organizational culture, or how healthcare providers "do things here" are of importance[33,34]. Organizational culture can be defined as: *the social-organizational phenomena in terms of attitudes or behavior, that emerge from a common way of sense-making, based on shared values, beliefs, assumptions and norms* [35-37]. There are challenges in analyzing the impact of organizational culture on hospital discharge as cultural aspects are often hidden in the underlying, (invisible) social constructions and attitudes[38-40], and therefore, difficult to identify and assess. Nevertheless, a deeper understanding of how handover problems at hospital discharge are related to underlying values, norms, beliefs, assumptions and subsequent behavior is needed as it may contribute to the development and implementation of effective and sustainable interventions to decrease the number of adverse care events.

Insufficient insight in appropriate discharge interventions

Our second assumption in this thesis is that improving quality and safety of hospital discharge requires insight in effective and theory-based discharge interventions that address the (local) identified discharge barriers. A variety of interventions have been developed to improve patient handovers at hospital discharge; e.g., in medication adherence, discharge communication between hospital and primary care providers, and timely and accurate information transfer from the hospital to the community setting. However robust evidence for a particular type of discharge intervention remains scarce. For example, there are several studies showing medication reconciliation by a pharmacist to be effective[41-43], whereas other studies show a lack of evidence[27,44]. An important reason for the limited effectiveness of discharge interventions could be the lack of a sound rational for the choice of such interventions[45], and the use of inadequate methods to design, execute and evaluate the interventions[46,47]. Furthermore, the success of an intervention may strongly depend on the local setting (e.g., academic or regional hospital) as well. To be effective, interventions should be theory- and evidence based and targeted at specific behavioral and environmental factors (e.g., institutional characteristics) determining healthcare performance[48-50]. Models exist that specify the phases and consequent steps to be taken, such as the Intervention Mapping framework[51], which is well-known in the field of health promotion[52-54]. However, they have not been used in the field of patient handover or, more specifically hospital discharge, so far. So, as yet, it is unclear what interventions may ultimately lead to higher quality and safer hospital discharge given the (local) behavioral and environmental discharge barriers.

The HANDOVER study

The sense of urgency to improve patient handovers between the hospital and primary care setting has resulted in various, large governmental-funded projects with the aim to improve such handovers. Well-known examples are the project BOOST (Better Outcomes For Older Adults Through Safe Transitions)[55] and the project STAAR[56] (STate Action on Avoidable Rehospitalizations). The international project HANDOVER, that started in 2008 and ended in 2011, was the first project funded by the European Union (EU) on transitions of patient care. The main aim of this project was to identify the barriers and facilitators to effective patient handover at referral and hospital discharge, and to study best-practices and the effectiveness of these practices in terms of costs and impact on patients. The main activity within the HANDOVER project was a large prospective, qualitative study on patient handovers between hospital and primary care, carried out in regional and academic hospitals in five countries: the Netherlands, Spain, Italy, Poland and Sweden. Data collection and analysis consisted of a variety of qualitative methods: individual and focus group interviews, process map analyses, artifact analyses and

Ishikawa (fishbone) diagrams. The content of this Ph.D. thesis is largely based on the studies that were conducted within the HANDOVER project, thereby focusing specifically on hospital discharge.

Aim of the thesis

The general aim of this thesis is twofold:

I: To explore what attitudinal and behavioral factors hinder effective hospital discharge, especially in the context of organizational culture.

II: To identify effective discharge interventions and to describe what theory-based methods and practical applications can be used for tailoring local intervention programs to improve hospital discharge.

The research questions are classified according to these two aims. Table 1 presents the six research questions that were addressed in this thesis, as well as the study methods used.

Table 1. Summary of research questions and methods used

Chapter	Research questions	Design
Chapter 2	What are the barriers and facilitators to effective hospital discharge, experienced and perceived by hospital and primary care providers, patients and relatives in a large university hospital and the related community care area in the Netherlands?	Individual and focus group interviews Survey
Chapter 3	What is the impact of organizational culture on hospital discharge?	Individual and focus group interviews
Chapter 4	What are the perceptions and experiences of care providers, patients and relatives regarding patient-centered care in the discharge process?	Individual and focus group interviews
Chapter 5	What are the patient experiences and perceptions regarding their participation in care transitions between the hospital and community care setting?	Individual and focus group interviews
Chapter 6	What are the intervention and study characteristics, and the overall effects of interventions that were tested in randomized controlled trials (RCTs) aimed to improve patient handovers from hospital to primary care?	Systematic review
Chapter 7	What are systematically developed and theory-based intervention programs to enhance quality and safety of hospital discharge	Intervention Mapping

Outline of the thesis

Chapter 2 describes the results of a study on barriers and facilitators to effective hospital discharge performed in one Dutch university hospital (Radboud University Medical Centre, Nijmegen) and the related community care area in the Netherlands. Focus group interviews were conducted with hospital and community care providers. Individual interviews were held with patients and their relatives. Based on the results from the focus group and individual interviews, questionnaires were developed and distributed among patients, relatives and related nurses and physicians from hospital and community care.

Chapter 3 explores the impact of organizational culture on hospital discharge. In five EU countries 192 individual and 25 focus group interviews were conducted with patients and relatives, hospital physicians, hospital nurses, general practitioners (GPs) and community nurses. Grounded Theory was used to analyze the data.

Chapter 4 presents the results of a qualitative study to explore perceptions and experiences of care providers, patients and relatives in five EU countries regarding patient-centered care in the discharge process.

Chapter 5 describes the results of a qualitative study to explore patient experiences and perceptions in five EU countries regarding their participation in care transitions between the hospital and community care setting.

Chapter 6 describes a systematic review of interventions aimed to improve patient handovers from hospital to primary care that were tested in randomized controlled trials (RCTs) and to systematically evaluate the intervention characteristics, and their overall effects as well as the characteristics of the study they were tested in.

Chapter 7 presents the use of the systematic and theory-based method of Intervention Mapping (IM) for the development of a program to improve hospital discharge. The previous chapters 3, 4, 5 and 6 formed important input for this study.

Finally, **chapter 8** summarizes and discusses the main findings of this thesis, considers its strengths and limitations, as well as the implications of the findings for quality and safety improvement of hospital discharge.

References

1. Kripalani S, Jackson AT, Schnipper JL, et al. Promoting effective transitions of care at hospital discharge: a review of key issues for hospitalists. J Hosp Med 2007;2:314-23.
2. Halasyamani L, Kripalani S, Coleman E, et al. Transition of care for hospitalized elderly patients – development of a discharge checklist for hospitalists. J Hosp Med 2006;1:354-60.
3. Cohen SG, Bailey DE. What makes teams work: group effectiveness research from the shop floor to the executive suite. Journal of Management 1997;23:239-90.
4. Barach P, Johnson JK. Understanding the complexity of redesigning care around the clinical microsystem. Qual Saf Health Care 2006;15:i10-i16.
5. Mohr JJ, Batalden P, Barach P. Integrating patient safety into the clinical microsystem. Qual Saf Health Care 2004;13:ii34-ii38.
6. Mistiaen P, Duijnhouwer E, Wijkel D, et al. The problems of elderly people at home one week after discharge from an acute care setting. J Adv Nurs 1997;25:1233-40.
7. Coleman EA, Smith JD, Frank JC, et al. Preparing patients and caregivers to participate in care delivered across settings: the Care Transitions Intervention. J Am Geriatr Soc 2004;52:1817-25.
8. Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161-7.
9. Forster AJ, Clark HD, Menard A, et al. Adverse events affecting medical patients following discharge from hospital. CMAJ 2004;170:345-9.
10. Boockvar K, Fishman E, Kyriacou CK, et al. Adverse events due to discontinuations in drug use and dose changes in patients transferred between acute and long-term care facilities. Arch Intern Med 2004;164:545-50.
11. Moore C, Wisnivesky J, Williams S, et al. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. J Gen Intern Med 2003;18:646-51.
12. Murtaugh CM, Litke A. Transitions through postacute and long-term care settings: Patterns of use and outcomes for a national cohort of elders. Med Care 2002;40:227-36.
13. Halfon P, Eggli Y, van Melle G, et al. Measuring potentially avoidable hospital readmission's. J Clin Epidemiol 2002;55:573-87.
14. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-services program. N Engl J Med 2009;360:1418-28.
15. Friedman B, Basu J. The rate and cost of hospital readmissions for preventable conditions. Med Care Res Rev 2004;61:225-40.
16. Jencks SF. Defragmenting care. Ann Intern Med 2010;153:757-8.
17. Institute of Medicine. To err is human - building a safer health system. Washington, DC: National Academy Press, 2000.
18. Kripalani S, LeFevre F, Phillips CO, et al. Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. JAMA 2007;297:831-41.
19. van Walraven C, Seth R, Austin PC, et al. Effect of discharge summary availability during post-discharge visits on hospital readmission. J Gen Intern Med 2002;17:186-92.
20. van Walraven C, Seth R, Laupacis A. Dissemination of discharge summaries. Not reaching follow-up physicians. Can Fam Physician 2002;48:737-42.
21. Pantilat SZ, Lindenauer PK, Katz PP, et al. Primary care physician attitudes regarding communication with hospitalists. Am J Med 2001;111:15S-20S.
22. Schoen C, Davis Km, How SK, et al. U.S. health system performance: a national scorecard. Health Aff (Millwood). 2006;25:w457-75.
23. Makaryus AN, Friedman EA. Patients' understanding of their treatment plans and diagnosis at discharge. Mayo Clin Proc 2005;80:991-4.
24. Dudas V, Bookwalter T, Kerr KM, et al. The impact of follow-up telephone calls to patients after hospitalization. Am J Med 2001;111:26S-30S.
25. Ziaeian B, Araujo KL, Van Ness PH, et al. Medication reconciliation accuracy and patient understanding of intended medication changes on hospital discharge. J Gen Intern Med 2012;27(11):1513-20.
26. Coleman EA, Smith JD, Raha D, et al. Posthospital medication discrepancies: prevalence and contributing factors. Arch Intern Med 2005;165:1842-7.

27. Kripalani S, Roumie CL, Dalal AK, et al. Effect of a pharmacist intervention on clinically important medication errors after hospital discharge: a randomized trial. Ann Intern Med 2012;157:1-10.
28. Bates DW, Spell N, Cullen DJ, et al. The costs of adverse drug events in hospitalized patients. Adverse Drug Events Prevention Study Group. JAMA 1997;277:307-11.
29. LaPointe NM, Jollis JG. Medication errors in hospitalized cardiovascular patients. Arch Intern Med 2003;163:1461-6.
30. Meara JR, Wood JL, Wilson MA, Hart MC. Home from hospital: a survey of hospital discharge arrangements in Northamptonshire. J Public Health Med 1992;14:145-50.
31. Isaac DR, Gijsbers AJ, Wyman KT, et al. The GP-hospital interface: attitudes of general practitioners to tertiary teaching hospitals. Med J Aust 1997;166:9-12.
32. Moore C, McGinn T, Halm E. Tying up loose ends: discharging patients with unresolved medical issues. Arch Intern Med 2007;167:1305-11.
33. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the Twenty-First Century. Washington DC, USA: National Academy Press, 2001.
34. Boan D, Funderburk F. Health care quality improvement and organizational culture. Easton, MD: Delmarva Foundation, 2003.
35. Schein EH. Organisational culture and leadership. 2nd ed. San Francisco: Jossey-Bass, 1992.
36. Brown A. Organizational culture. London: Pitman Publishing, 1995.
37. Bolman LG, Deal TE. Reframing organisations: Artistry, choice and leadership. San Francisco, CA: Jossey-Bass, 1997.
38. Bate SP. Strategies for cultural change. Oxford: Elsevier Science & Technology, 1994.
39. Weick, KE. Sensemaking in organizations. Thousand Oaks, CA: Sage, 1995.
40. Davies H, Nutley S, Mannion M. Organisational culture and quality of health care. Qual Health Care 2000;9:111-9.
41. Preen DB, Bailey BE, Wright A, et al. Effects of a multidisciplinary, post-discharge continuance of care intervention on quality of life, discharge satisfaction, and hospital length of stay: a randomized controlled trial. Int J Qual Health Care 2005;17:43-51.
42. Schnipper JL, Kirwin JL, Cotugno MC, et al. Role of pharmacist counseling in preventing adverse drug events after hospitalization. Arch Intern Med 2006;166:565-71.
43. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. Ann Intern Med 2009;150:178-87.
44. Walker PC, Bernstein SJ, Jones JN, et al. Impact of a pharmacist-facilitated hospital discharge program: a quasi-experimental study. Arch Intern Med 2009;169:2003-10.
45. Grimshaw JM, Thomas RE, MacLennan G, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. Health Technol Assess 2004;8:1-72.
46. Campbell M, Fitzpatrick R, Haines A, et al. Framework for design and evaluation of complex interventions to improve health. BMJ 2000;321:694-6.
47. Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? Br J Gen Pract 1998;48:991-7.
48. van Bokhoven MA, Kok G, van der Weijden T. Designing a quality improvement interventions: a systematic approach. Qual Saf Health Care 2003;12:215-20.
49. Grol RPTM. Implementing guidelines in general practice care. Qual Health Care 1992;1:184-91.
50. Baker R, Camosso-Stefinovic J, Gillies C, et al. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes (Review). Cochrane Database Syst Rev 2010:CD005470.
51. Bartholomew LK, Parcel GS, Kok G, Gottlieb NH. Planning health promotion programs. An intervention mapping approach. Third edition. San Francisco, CA: Jossey-Bass, 2011.
52. Mullen PD, DiClemente CC, Bartholomew LK. Theory and context in project PANDA: a program to help postpartum women stay off cigarettes. In: Bartholomew LK, Parcel GS, Kok G, Gottlieb NH, editors. Intervention mapping: designing theory and evidence-based health promotion programs. Mountain View, CA: Mayfield Publishing Co; 2001.
53. van Empelen P, Kok G, Schaalma HP, et al. An AIDS risk-reduction program for Dutch drug users: an intervention mapping approach to planning. Health Promot Pract 2003;4:402-12.

54. Heinen MM, Bartholomew LK, Wensing M, et al. Supporting adherence and healthy lifestyles in leg ulcer patients: systematic development of the lively legs program for dermatology outpatient clinics. Patient Educ Couns 2006;61:279-91.
55. Society of Hospital Medicine. BOOSTing Care Transitions Resource Room. Philadelphia: Soc of Hospital Medicine; 2008. Accessed at www.hospitalmedicine.org/resourceroomredesign/rr_caretransitions/CT_Home.cfm on 1 January 2012.
56. Institute for Healthcare Improvement. State Action on Avoidable Rehospitalizations (STAAR) Initiative. Cambridge, MA: Inst for Healthcare Improvement; 2012. Accessed at www.ihi.org/staar on 1 January 2012.

Chapter 2

Quality and safety of hospital discharge: A study on experiences and perceptions of patients, relatives and care providers

Gijs Hesselink
Lisette Schoonhoven
Marieke Plas
Hub Wollersheim
Myrra Vernooij-Dassen

International Journal for Quality in Health Care 2013;25(1):66-74.

ABSTRACT

Objective: To identify barriers experienced and perceived at discharge by physicians, nurses, patients and relatives.

Design: We developed questionnaires based on focus group interviews with hospital and community care providers, and individual interviews with patients and relatives. A survey was conducted among patients, relatives and related nurses and physicians from hospital and community care.

Setting: One university hospital and the related community care area in The Netherlands.

Participants: Thirty healthcare providers and eight patients and/or relatives participated in focus group and individual interviews. Questionnaires were returned by 344 healthcare providers and 206 patients and relatives.

Results: Information from the hospital to community care is often incomplete, unclear and delayed. Especially hospital physicians (52%) and general practitioners (GPs; 63%) experience the quality of information exchanged from the hospital to the GP as poor. Coordination of care is often frustrated by a lack of care provider knowledge and collaboration. Hospital physicians (47%) and GPs (71%) feel that hospital physicians are often not sufficiently aware of the patient's home situation. Respectively 59% and 81% experience that the GP is often not clearly informed about expected tasks and responsibilities at discharge.

Conclusions: This is the first study that provides a clear picture of the experiences and perceptions of stakeholders regarding handovers at hospital discharge. Lack of knowledge, understanding and interest between hospital and community care providers are important causes for ineffective and unsafe discharge. The study suggests that improvement efforts should be focused more on these aspects, as primary conditions for improving hospital discharge.

INTRODUCTION

Hospitals have a responsibility to ensure that patients are discharged from hospital care in a safe and efficient manner[1]. This is becoming increasingly important, considering the trend towards shorter hospital stays and more care in the community[2], and the rising number of high-risk and elderly patients, who require more frequent and complex transitions[3]. Despite the growing interest in the quality and safety of hospital discharge, research has shown that a variety of adverse events frequently occur in the handover of care, affecting patients after discharge from the hospital. In most cases these adverse events could have been avoided[4,5]. In addition, these adverse events in hospital discharge sometimes result in unnecessary readmissions and lead to a considerable amount of extra costs[6].

These quality and safety problems seem to be related to the continuity of care, which is considered to be a critical aspect for all types of handovers[7]. According to Hellesø, Lorensen, and Sorensen[8], continuity of care refers to: "the formal and informal communication, coordination and structured and unstructured information exchange at an individual and organizational level". Studies have identified various discontinuities when care is handed over from the hospital to the community care setting in terms of delayed or absent communication, inaccuracies in information exchange and ineffective planning or coordination of care between care providers[9-13]. However, in-depth insight into the causes of identified discontinuities in the discharge process is limited. Handover problems in the discharge process are predominantly investigated by exploring the experiences and perceptions of care providers, patients, and relatives separately[6,13-16]. Eliciting experiences and perceptions of care providers both in the hospital and community setting, patients, and relatives in the same study could provide a more comprehensive view of and a better insight in the handover process and the factors that hinder continuity of care from hospital to home. Therefore, this study explores every day experiences and beliefs regarding good handover of patients, relatives and care providers involved in discharge.

METHODS

Data collection

A survey was conducted at Radboud University Nijmegen Medical Center, a 1000-bed university hospital that serves as a referral centre for a population of approximately 2.5 million in the east of the Netherlands. Questionnaires were distributed among stakeholders to assess: a) how hospital discharge is experienced in daily practice, and b) what is perceived to be important in the handover process at discharge. The size and content of the questionnaires differed for each type of stakeholder. Each questionnaire consisted of general questions (varying between 14 and 27 questions) and a set of statements to address everyday experiences (varying between 13 and 32 statements) with, and beliefs (varying between 13 and 23 statements) about good handover at hospital discharge. The questionnaire was tested by heads of several clinical departments in a pre-final version, thereby increasing content validity. Statements were answered on a six-point Likert-scale ranging from 'totally disagree' to 'strongly agree'. Questionnaires (n=990) were distributed among 198 discharge cases. All patients from nine departments (Geriatrics, Internal, two Surgery departments, Paediatrics, Oncology, Urology, Gynaecology and Neurology) with a set discharge date received a questionnaire along with their relatives and their related hospital physicians, nurses and general practitioners (GPs). Patients were excluded if they or their relatives were physically or mentally not able to fill in the questionnaire. Questionnaires were distributed at the time of the patient's discharge, in a period of three months (June–August 2005). Reminder letters were sent after one month.

The questionnaire was based on focus group interviews and individual in-depth interviews. A focus group is a form of group interview that capitalizes the interaction between the participants in order to generate data. The idea behind the focus group method is that group processes can help people to explore and clarify their views in ways that would be less easily accessible in a one to one interview[17]. A total of four focus groups interviews were organized with hospital physicians (n=5), hospital nurses (n=10), GPs (n=5) and community nurses (n=10). We used purposive sampling to ensure diversity of care providers with respect to age, gender, experiences and attitude towards hospital discharge. Letters of invitation were initially sent to hospital wards as well as to GP- and homecare associations, who were subsequently asked to recruit participants. Hospital physicians and nurses were sampled from eight wards including Internal Medicine, Surgery, Oncology, Gynaecology, Paediatrics and Geriatrics. Groups were organized based on their type of profession in order to elicit the dominant perspectives that exist within each profession. Eight individual in-depth interviews were conducted with patients and/or relatives after discharge at home, because several patients had been recently discharged from the hospital and were not able to travel to a focus group meeting. Patients and/or relatives were selected from the transitional care unit of the hospital (for patients receiving homecare) and from nursing departments (for patients not receiving homecare). We used purposive sampling to ensure diversity of patients (i.e., age, gender, diagnosis). To diminish recall problems, the interviews were planned in a short period (between one and three weeks) after actual discharge from the hospital. All focus group and individual interviews were facilitated by a guide with open-ended questions, based on topics derived from a literature study. The topics focused on the experiences with and perceptions on: the information exchange, the coordination of care and the communication between hospital and community care providers and between care providers and patients and relatives in the discharge process. Interviews were audio-taped with the participants' consent. Formal approval for the study was given by the board of directors of the university medical centre. The local ethics committee was consulted by telephone. Since the patients involved in this study would not be subjected to interventions, the ethics committee decided it was not necessary to formally submit the proposal for an ethical decision. According to

Dutch law this does not exempt from asking informed consent from each individual participant, which we did.

Data analysis

Quantitative data were analyzed using SPSS 16.0 for Windows (SPSS Inc., 1993). The responses to the statements, addressing everyday experiences with and beliefs about good handover, were dichotomized per item as 'disagree' from 1 to 3 and 'agree' from 4 to 6. We calculated the percentages of 'agree' responses and performed logistic regression analyses to test whether each respondent group's percentage agreeing differs significantly from the average percentage agreeing of the other respondent groups combined. Statistical significance was set at $P < 0.05$ and high significance at $P < 0.001$.

All recorded focus group interviews were transcribed verbatim and individual interviews were summarized for analysis. Systematic content analysis[18], was performed by two researchers (MP and GH). Emerging themes were developed by a repeated study of the transcripts and the attribution of codes to text segments. Codes referring to the same phenomenon were grouped in categories, and categories were grouped in themes.

RESULTS

Of the total of 990 distributed questionnaires, 550 were returned (56%). The response rate varied per type of stakeholder: 84% for hospital nurses (n=167), 52% for hospital physicians (n=103), 37% for GPs (n=74), 54% for patients (n=107), 50% for relatives (n=99). Questionnaires that were distributed in the Paediatrics Department were filled in by the patients' parents. Table 1 shows the patient characteristics. Hospital nurses, patients and relatives experience the quality of handover practice at hospital discharge as moderate to very positive. In contrast, the experiences of hospital physicians and GPs with handovers at hospital discharge are less positive. The most important findings are presented in table 2 and 3, and will be discussed in more detail below. Table 4 provides an overview of the survey topics and wording variation of the items per stakeholder group.

Table 1. Respondent characteristics

Characteristics	Patients *n=107*	Relatives *n=99*	Hospital physicians *n=103*	Hospital nurses *n=167*	GPs *n=74*
Age, mean years (SD)	55 ± 17	53 ± 15	30 ± 4	33 ± 10	49 ± 8
Female sex, *n* (%)	49 (46)	62 (63)	82 (80)	138 (83)	14 (19)
Nationality other than Dutch, *n* (%)	3 (3)	2 (2)	N/A	N/A	N/A
Length of stay, mean days (SD)	10.6 ± 14.5	N/A	N/A	N/A	N/A

Abbreviations: GP=general practitioner; SD=standard deviation; N/A=not applicable.

Table 2. Experiences with handover at discharge (most important findings per topic area†)

Topic areas	Hospital physicians Agree (%)	Hospital nurses Agree (%)	GPs Agree (%)	Patients Agree (%)	Relatives Agree (%)
Information about medication and/ or care support after discharge from hospital to community care is adequate.	48	88*	37*	N/A	N/A
Information about the hospital treatment of the patient from hospital to community care is adequate.	60	N/A	50	54	58
Information at discharge to patient and family about follow-up treatment and support is adequate.	58	63	43*	64	55
Knowledge of the hospital about the patient's situation at home is adequate.	53**	86**	29**	74	80
Knowledge of the hospital about the patient's follow-up after discharge is adequate.	88	90*	42*	N/A	N/A
Information about tasks between hospital and community care is clear.	41	89**	19**	N/A	N/A
Coordination of responsibilities between hospital and community care is adequate.	26*	N/A	10*	N/A	N/A
Information exchange between hospital and community care is timely.	57	N/A	51	55	45
Contact person(s) between hospital and community care are clear.	51	N/A	58	N/A	N/A

Abbreviation: GPs=general practitioners; N/A=not available.

† One or more of the stakeholders with ≤60% agreement score on an item within the specific topic area.

* $P < 0.05$

** $P < 0.001$

Table 3. Perceived importance of handover at discharge (most important findings per topic area†)

Topic areas	Hospital physicians Agree (%)	Hospital nurses Agree (%)	GPs Agree (%)	Patients Agree (%)	Relatives Agree (%)
Adequate information about medication and/ or care support after discharge from hospital to community care.	84*	92	95	N/A	N/A
Adequate information about the hospital treatment of the patient from hospital to community care.	64**	N/A	94*	95	98*
Adequate information at discharge to patient and family about follow-up treatment and support.	96	N/A	97	100	99
Sufficient knowledge of the hospital about the patient's situation at home.	81	96	85	93	91
Sufficient knowledge of the hospital about the patient's follow-up after discharge.	N/A	98	95	N/A	N/A
Adequate coordination of tasks and responsibilities between hospital and community care.	78*	96*	99*	N/A	N/A
Timely information exchange between hospital and community care.	N/A	N/A	93	N/A	N/A
Hospital and community care providers available for each other to discuss or exchange information regarding a patient.	78*	85	97*	N/A	N/A

Abbreviation: GPs=general practitioners; N/A=not available.

† The scores on perceived importance were selected on items from topic areas that relate the most important findings presented in table 2.

* $P < 0.05$; ** $P < 0.001$

Table 4. Overview of survey topics and wording variation of items per stakeholder group

Stakeholder	**Information about medication and/or care support after discharge from hospital to community care is adequate**
Hospital physicians	I informed the GP well about the medication and/or care support that the patient needed after discharge.
Hospital nurses	I informed the community nurse well about the medication and/or care support that the patient needed after discharge.
GPs	The hospital physicians informed me well about the medication and/or care support that the patient needed after discharge.
	Information about the hospital treatment of the patient from hospital to community care is adequate
Hospital physicians	I informed the GP well about the treatment of the patient in the hospital.
GP	The hospital physician informed me well about the treatment of the patient in the hospital.
Patients	The hospital informed the GP well about my treatment in the hospital.
Relatives	The hospital informed the GP well about the hospital treatment of my relative.
	Information to patient and family at hospital discharge is adequate
Hospital physicians and nurses	The patient received understandable and readable information at hospital discharge regarding his/her follow-up treatment.
GPs	The hospital physicians informed the patient well about the medication and/or care support that he/she needed after hospital discharge.
Patients	I received understandable and readable information at hospital discharge regarding my follow-up treatment.
Relatives	I received understandable and readable information at hospital discharge regarding the follow-up treatment of my relative.
	Knowledge of the hospital about the patient's situation at home is adequate
Hospital physicians and nurses	I was well aware of the patient's home situation.
GPs	The hospital physicians was well aware of the patient's home situation.
Patients	The hospital was well aware of my home situation.
Relatives	The hospital was well aware of the home situation of my relative.
	Knowledge of the hospital about the patient's follow-up after discharge is adequate
Hospital physicians and nurses	I had sufficent knowledge of the patient's follow-up after hospital discharge.
GPs	The hospital physicians had sufficient knowledge of the patient's follow-up after hospital discharge.
	Information about tasks between hospital and community care is clear
Hospital physicians	I informed the GP clearly on the tasks I expect from him/her in the follow-up after hospital discharge.
Hospital nurses	I informed the community nurse clearly on the tasks I expect from him/her in the follow-up after hospital discharge.
GPs	The hospital physicians informed me clearly on the tasks he/she expects from me in the patient's follow-up after hospital discharge.
	Coordination of responsibilities between hospital and community care is adequate
Hospital physicians	I discussed the allocation of responsibilities in the patient's follow-up after hospital discharge with the GP.
GPs	The hospital physicians discussed the allocation of responsibilities in the patient's follow-up after hospital discharge with me.
	Information exchange between hospital and community care is timely
Hospital physicians	I informed the GP on time about the patient's hospital treatment.
GPs	The hospital physicians informed me on time about the patient's hospital treatment after his/her discharge.
Patients	The hospital informed the GP on time about my treatment in the hospital.
Relatives	The hospital informed the GP on time about the treatment of my relative in the hospital.

Stakeholder	**Information about medication and/or care support after discharge from hospital to community care is adequate**
	Contact persons between hospital and community care are clear
Hospital physicians	I informed the GP who he/she could contact in case of questions regarding patient's illness or treatment.
GPs	I know who to contact in the hospital when I have questions regarding patient's illness or treatment.

Abbreviation: GPs=general practitioners.

Experiences with information exchange

The information exchange from the hospital to the GP is experienced as poor. This was particularly the case with regard to the information about (i.e., the use of or instructions on) medication or care support facilities, which are needed in the follow-up treatment after discharge (hospital physicians 52%; GPs 63%), and with regard to the treatment that patients received at the hospital (patients 46%; relatives 42%). The experiences of care providers and patients mentioned in the interviews correspond with these findings. Interviewed GPs and community nurses often experience that important discharge information is missing. A few patients also mentioned experiences with community nurses, who were not fully up-to-date on their medical status and hospital treatment. Consequently, they had to inform the community nurse themselves extensively during their first visit. A community nurse confirmed these experiences:

> *"Often our clients return to home and there is nothing written by hospital physicians and other care providers about "we did this and that". Then we have to call back to the hospital again".*

Hospital physicians (43%), GPs (49%), patients (45%) and relatives (55%) also indicate that the information for the GP about treatment in the hospital is not received on time. Many of the interviewed GPs experience difficulties in providing adequate care after discharge, because of this information delay. According to them, it may take months before they receive a final discharge letter and this could increase the chance of adverse medical consequences. Several GPs also referred to situations where they had to deal with an upset patient because they did not contact or visit the patient after discharge, while the GP was not aware of the patients' discharge.

Shortcomings were also indicated in the quality of information from the hospital to the patients. Hospital physicians (42%), GPs (57%) and hospital nurses (37%) indicate that patients are often not informed clearly enough, in particular about the required follow-up treatment, medication and care facilities. In the interviews patients expressed that they did not know what exactly was going to happen after discharge, whether or not their GP had been informed by the hospital about their discharge, and who they should contact in case of any questions. In some cases this created uncertainty and anxiety in patients on how to deal with their health issues.

Experiences with the coordination of care

In contrast to the other stakeholders, 47% of the hospital physicians and 71% of the GPs experience that the hospital often has insufficient knowledge about the patient's home situation. The experiences of the hospital physicians and GPs on this matter differ from the experiences of the other respondents combined ($P < 0.001$). According to 58% of the GPs, the hospital is also unfamiliar with the care process after discharge. These experiences of the GPs differ from the experiences of hospital care providers ($P < 0.05$). According to interviewed GPs, this lack of knowledge forms a barrier for proper coordination of care. One GP illustrated this using the delegation of certain medical actions (e.g., intravenous treatment) from the GP to the community nurses as an example. GPs are often unable to organize intravenous treatment by nurses, because the hospital physician did not inform them in time about discharge. Hospital physicians are unaware of the delegation procedure, thereby letting the chance slip away to coordinate aftercare more effectively. Some GPs also indicate that hospital physicians are not informed of the consequences of ineffective discharge, since problems eventually pop up in the community care setting, which is mostly out of their sight.

> *"I think hospital physicians should be more aware of how many things go wrong and eventually end up on our plate. Things that we then repair and correct without them knowing, without them ever even hearing about it. (...) So many things go wrong, which we solve in the patient's interest, that they do not realize enough how extensive the problem really is".*

Although many hospital nurses indicated that they had sufficient insight of the patient's home situation (86%) and the patient's follow-up after hospital discharge (90%), hospital nurses in the focus group interview expressed often being unfamiliar with the necessity to arrange proper follow-up. For example, it is often believed that a new health and social care assessment is not necessary, when a patient received homecare before as well. However, once at home, it turns out that patients do need a new care assessment in order to start with adequate homecare on time. Also, some hospital nurses indicated that they often do not know the exact potential of homecare (e.g., community nurses and relatives).

> *"The problems that we often have is that you do not always know which care can actually be offered at home and by whom. That is not always clear, sometimes more than at other times...".*

Another source for problems in coordinating care at discharge seems to be the lack of collaboration between hospital and community care providers. Both hospital physicians (59%) and GPs (81%) point out that the GP is often not clearly informed about the tasks and responsibilities that are expected from him/her after discharge. Significantly more GPs perceive this lack of collaboration (81%) than hospital physicians and nurses combined ($P < 0.001$). According to 90% of the GPs there is insufficient discussion about the allocation of responsibilities in the patient's follow-up after discharge. One GP illustrated this as follows:

> *"Who does what...because that is also important and that is often unclear in discharge letters. It (the discharge letter) often says: "Potassium needs to be checked once in a while". And then I think: "by whom...by me or the hospital physician"? These things really make me sick! (...) I expect more clarity in the letters about what they do in order to avoid duplication of work".*

Several interviewed GPs and hospital physicians also experienced that the focus of the hospital is rather more on fulfilling their own specific tasks and responsibilities. They sensed a reluctance of hospital physicians to handover care or relevant information to the GP at discharge.

> *"I think we tend to keep care in our own hands...with us in the hospital. (...) Well, by doing that you keep the GP uninformed. (...) The thing is that the GP gets involved at a later stage, so he misses a part of the care process. I think that is a problem".*

Moreover, interviewed GPs feel underestimated in their knowledge and skills by hospital physicians and see this as a major explanation for the latter's lack of effort to collaborate at handover. For example, one GP stated that a hospital physician would have called him in time about a patient-discharge if he had been regarded as a respectable professional fellow. Community nurses seem to encounter a lack of understanding and respect as well. They sometimes have the impression that their colleagues at the hospital are not very interested in the continuity of care after discharge and that they distance themselves from any involvement.

> *"But I think, well, you know, I do not have any evidence but I do get the impression that they look at us as something that is less trustworthy or competent than their own profession".*

Experiences with communication

GPs indicate that they are easily accessible for the hospital physician, before and after discharge. However, reaching the right contact person at the hospital in case of patient-related questions after discharge is more difficult. Hospital physicians (49%) and GPs (42%) indicate that it is often not (made) very clear for GPs who to call for. Many GPs feel the need for quicker and more frequent contact when their involvement is needed (e.g., in case of important changes in the patient's condition or when important decisions have to be made, for example in the case of euthanasia).

Community nurses expressed that discharge communication with their colleagues in the hospital is frustrated by the many indirect lines. Despite the fact that the presence of a liaison nurse reduces the workload for hospital nurses at discharge, it also increases the communication gap with caregivers in the community. A community nurse said:

> *"I often miss the personal contact. Handover runs via different communication lines and that costs us a lot of time. (...) I miss the old days when you were able to quickly discuss (with the responsible hospital nurse) the situation at the hospital, at home and decided about follow-up".*

Hospital nurses recognize that they have less direct contact with community nurses nowadays, which makes it hard to exchange relevant information quickly and effectively. Furthermore, they often do not know whether the requested homecare has been applied. Therefore, more direct and personal contact between hospital and community nurses would, in their eyes, contribute to the continuity of care from hospital to home.

Perceptions on a good handover at discharge

According to the stakeholders, a good handover at hospital discharge must reach up to a variety of standards regarding quality of information exchange, coordination of care and communication. The most important scores from the questionnaire are presented in table 3. In general, all stakeholders agree that information from the hospital to community care, and to patients and relatives, needs to be sufficient, understandable and on time. Hospital physicians (84%) and GPs (95%) believe that hospital physicians should inform the GP about the medication and/or care support the patient needs after discharge. GPs (94%), patients (95%) and relatives (98%) agree that the hospital needs to inform the GP well about the patient's hospital treatment. Significantly less hospital physicians (64%) agreed that it is important that GPs are well informed about the patient's hospital treatment than GPs, patients, and relatives combined ($P < 0.001$).

Hospital physicians (96%) and GPs (97%) think that hospital physicians should give the patient sufficient and accurate information regarding medication and/or care support after discharge. Eighty-one percent of the hospital physicians and 85% of the GPs believe that hospital physicians should have sufficient knowledge of the patient's home situation. Furthermore, 99% of the GPs and 78% of the hospital physicians feel that the hospital physician should be clear about which tasks are expected from the GP. Hospital physicians (73%) and GPs (88%) indicate that the same goes for the responsibilities of the hospital physician. Finally, knowing who to contact and accessibility in the hospital for GPs, and vice versa, are considered important by 78% of the hospital physicians and 97% of the GPs.

DISCUSSION

The aim of this study was to explore the experiences with and beliefs about good handover at hospital discharge of care providers, patients and relatives. Both quantitative and qualitative findings of this study suggest that the continuity of care at hospital discharge is often not guaranteed. The findings revealed that barriers were mainly associated with three themes: the quality of information exchange, the coordination of care and communication between hospital and community care providers. The most important finding is that hospital staff is unacquainted with the care in the community and does not anticipate enough on the needs of the community care providers to continue care after patients have been discharged from the hospital. These conditions primarily seem to originate from a lack of understanding of, and interest in, post-discharge care activities. This is experienced especially by GPs where it concerns hospital physicians. It appears that crucial discharge information, related to patient treatment or illness and about what is expected in terms of tasks and responsibilities, is often incomplete, unclear, delayed or even missed. Moreover, in such cases it often seems to be difficult for community care providers to reach the right contact person at the hospital after discharge to get questions answered (e.g., concerning treatment or illness of the patient). Consequently, this often leads to confusion for GPs, community nurses, patients and relatives and increases the chance of suboptimal follow-up. Despite the experienced barriers in daily practice, all stakeholders perceive quality of information exchange, coordination of care and communication as valuable factors in handovers at discharge. This demonstrates that all parties involved in the discharge process identify a gap between current and safe discharge practice and the need for improvement.

This study provides novel and valuable insights into the experiences and beliefs of care providers, patients, and relatives, and their subsequent behavior that hinders continuity of care at discharge. Various studies have already shown the discharge problems identified in this study, such as delayed communication and inaccuracies in information transfer among hospital and community care providers[9,11,12,19], described consequences of ineffective discharge[4,5,20-22], and reported subsequent quality and safety criteria and implications for practice[7-9,23]. However, scientific attention to a better understanding of ineffective and unsafe discharge was limited or, in other words, a 'black box'. We found that many of the identified handover barriers at discharge show a similarity with handover barriers within the hospital or community care setting[24-26], and that many of these barriers are caused by a lack of time, professional attitudes, and a fragmented handover organization[27-31]. This is the first study that addresses a lack of knowledge and understanding between hospital and community care providers, and a lack of effort to anticipate on the needs of the professional counterpart as important causes for discontinuity of care at hospital discharge. The findings of the study were an eye-opener for the board of directors and for many of the interviewed healthcare providers of the Radboud University Nijmegen Medical Centre. It directly triggered them to develop and implement a protocol to improve the timeliness and quality of discharge information.

Knowledge and understanding between hospital and community care providers, and interest of healthcare providers in patient handover are important prerequisites for improving the quality and safety of hospital discharge, that need further improvement. The lack of evidence-based handover training and educational programs[15,24,32-34], shows there is ample room for improvement in this area, next to the development and implementation of practical tools. Further research in this domain is needed as an important base for quality and safety improvement of handovers[35], especially when it has to be organized across healthcare institutions and services where perceptions and meanings often seem to differ.

Our study had several limitations. First of all, community nurses were not included in the quantitative analysis, because not all patients received homecare after hospital discharge. We suggest to include community nurses in future quantitative research, so that differences identified between hospital physicians and GPs can be compared with those between hospital and community nurses. Second, as this study was conducted in 2005-2006, presented findings might seem less relevant in 2010. However, during these five years no fundamental changes in the Dutch healthcare system have occurred with regard to the organization of hospital discharge. Therefore we assume that the study still resembles the present experiences and perceptions of stakeholders. Although various studies have reported about discharge inadequacies since our study was performed[9,14], insight in the underlying causes remained limited. Third, it is possible that statistically significant findings in the quantitative study occurred by chance due to multiple comparisons. These findings should therefore be seen as exploratory and need to be interpreted with caution. Furthermore, the high none-response of GPs to the questionnaire may implicate possible bias of the quantitative results. Finally, the small sample size of individual and focus group interviewees in one university hospital might raise questions about the generalizability of our findings. Nevertheless, the results from the interviews are quite similar to the results from the 652 returned questionnaires. Therefore, these results are believed to provide sufficient insight into the major barriers that are encountered in handovers at hospital discharge, which possibly stimulates further work in this area.

REFERENCES

1. Preen DB, Bailey BES, Wright A, et al. Effects of a multidisciplinary, post-discharge continuance of care, intervention on quality of life, discharge satisfaction, and hospital length of stay: a randomized controlled trial. Int J Qual Health Care 2005;17:43-51.
2. Mistiaen P, Duijnhouwer E, Ettema T. The construction of a research model on post-discharge problems based on a review of the literature 1990-1995. Soc Work Health Care 1999;29:33-68.
3. Halasyamani L, Kripalani S, Coleman E, et al. Transition of care for hospitalized elderly patients – development of a discharge checklist for hospitalists. J Hosp Med 2006;1:354-60.
4. Forster AJ , Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161-7.
5. Forster AJ, Clark HD, Menard A, et al. Adverse events affecting medical patients following discharge from hospital. CMAJ 2004;170:345-9.
6. Foekema H, Hendrix C. Fouten worden duur betaald. Een onderzoek naar medische overdrachtsfouten (deel 2). Amsterdam: TNS NIPO, 2004 [in Dutch].
7. Clare J, Hofmeyer A. Discharge planning and continuity of care for aged people: indicators of satisfaction and implications for practice. Aust J Adv Nurs 1998;16:7-13.
8. Hellesø R, Lorensen M, Sorensen L. Challenging the information gap-the patients transfer from hospital to home health care. Int J Med Inform 2004;73:569-80.
9. Kripalani S, LeFevre F, Philips CO, et al. Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. JAMA 2007;297:831-41.
10. Stiell AP, Forster AJ, Stiell IG, et al. Maintaining continuity of care: a look at the quality of communication between Ontario emergency departments and community physicians. CJEM 2005;7:155–61.
11. Coleman EA, Smith JD, Raha D, et al. Posthospital medication discrepancies, prevalence's and contributing factors. Arch Intern Med 2005;165:1842–7.
12. van Walraven C, Seth R, Laupacis A. Dissemination of discharge summaries. Not reaching follow-up physicians. Can Fam Physician 2002;48:737-42.
13. Pantilat SZ, Lindenauer PK, Katz PP, et al. Primary care physician attitudes regarding communication with hospitalists. Am J Med 2001;111:15S-20S.
14. Arora VM, Prochaska BA, Farnan J, et al. Problems after discharge and understanding of communication with their primary care physicians among hospitalized seniors: a mixed methods study. J Hosp Med 2010;5:385-91.
15. Atwal A. Nurses' perceptions of discharge planning in acute health care: a case study in one British teaching hospital. J Adv Nurs 2002;39:450-8.
16. Mistiaen P, Duijnhouwer E, Wijkel D, et al. The problems of elderly people at home one week after discharge from an acute care setting. J Adv Nurs 1997;25:1233-40.
17. Kitzinger J. Qualitative research: introducing focus groups. BMJ 1995;311:299-302.
18. Pope C, Mays N. Reaching the parts other methods cannot reach: an introduction to qualitative methods in health and health services research. BMJ 1995;311:42-5.
19. Bull MJ, Roberts J. Components of a proper hospital discharge for elders. J Adv Nurs 2001;35:571-81.
20. Boockvar K, Fishman E, Kyriacou CK, et al. Adverse events due to discontinuations in drug use and dose changes in patients transferred between acute and long-term care facilities. Arch Intern Med 2004;5:545-50.
21. Roy CL, Poon EG, Karson AS, et al. Patient safety concerns arising from test results that return after hospital discharge. Ann Intern Med 2005;143:121-8.
22. Schnipper JL, Kirwin JL, Cotugno MC, et al. Role of pharmacist counseling in preventing adverse drug events after hospitalization. Arch Intern Med 2006;166:565-71.
23. Kripalani S, Jackson AT, Schnipper JL, et al. Promoting effective transitions of care at hospital discharge: a review of key issues for hospitalists. J Hosp Med 2007;2:314-23.
24. Raduma-Tomas MA, Flin R, Yule S, et al. Doctors' handovers in hospitals: a literature review. BMJ Qual Saf 2011;20:128-33.
25. Nagpal K, Abboudi M, Fischler L, et al. Evaluation of postoperative handover using a tool to assess information transfer and teamwork. Ann Surg 2011;253:831-7.
26. Apker J, Mallak LA, Gibson SC. Communicating in the 'gray zone': perceptions about emergency physician-hospitalist handoffs and patient safety. Acad Emerg Med 2007;14:884-94.

27. Owen C, Hemmings L, Brown T. Lost in translation: maximizing handover effectiveness between paramedics and receiving staff in the emergency department. Emerg Med Australas 2009;21:102-7.
28. Meissner A, Hasselhorn HM, Estryn-Behar M, et al. Nurses' perception of shift handovers in Europe – results from the European Nurses' Early Exit Study. J Adv Nurs 2007;57:535-42.
29. Krogstad U, Hofoss D, Hjortdahl P. Continuity of hospital care: beyond the question of personal contact. BMJ 2002;324:36-8.
30. Shaw A, de Lusignan S, Rowlands G. Do primary care professionals work as a team: a qualitative study. J Interprof Care 2005;19:396-405.
31. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the Twenty-first Century. Washington: National Academies Press, 2001.
32. Connolly M, Grimshaw J, Dodd M, et al. Systems and people under pressure: the discharge process in an acute hospital. J Clin Nurs 2009;18:549-58.
33. Brand SL. Nurses' roles in discharge decision making in an adult high dependency unit. Intensive Crit Care Nurs 2006;22:106-14.
34. Johnson JK, Arora VM. Improving clinical handovers: creating local solutions for a global problem. Qual Saf Health Care 2009;18:244-5.
35. Wong MC, Yee KC, Turner P. Clinical Handover Literature Review. eHealth Services Research Group. Australia: University of Tasmania, 2008.

Chapter 3

Organizational Culture. An important context for addressing and improving hospital to community patient discharge

Gijs Hesselink
Myrra Vernooij-Dassen
Loes Pijnenborg
Paul Barach
Petra Gademan
Ewa Dudzik-Urbaniak
Maria Flink
Carola Orrego
Giulio Toccafondi
Julie Johnson
Lisette Schoonhoven
Hub Wollersheim

Medical Care 2013;51(1):90-98.

ABSTRACT

Background: Organizational culture is seen as having a growing impact on quality and safety of health care, but its impact on hospital to community patient discharge is relatively unknown.

Objectives: To explore aspects of organizational culture to develop a deeper understanding of the discharge process.

Research design: A qualitative study of stakeholders in the discharge process. Grounded Theory was used to analyze the data.

Subjects: In 5 European Union countries, 192 individual and 25 focus group interviews were conducted with patients and relatives, hospital physicians, hospital nurses, general practitioners, and community nurses.

Results: Three themes emerged representing aspects of organizational culture: (I) a fragmented hospital to primary care interface; (II) undervaluing administrative tasks relative to clinical tasks in the discharge process; (III) and lack of reflection on the discharge process or process improvement. Nine categories were identified: inward focus of hospital care providers; lack of awareness to needs, skills, and work patterns of the professional counterpart; lack of a collaborative attitude; relationship between hospital and primary care providers; providing care in a "here and now" situation; administrative work considered to be burdensome; negative attitude toward feedback; handovers at discharge ruled by habits; and appreciating and integrating new practices.

Conclusions: On the basis of the data, we hypothesize that the extent to which hospital care providers value handovers and the outreach to community care providers is critical to effective hospital discharge. Community care providers often are insufficiently informed about patient outcomes. Ongoing challenges with patient discharge often remain unspoken with opportunities for improvement overlooked. Interventions that address organizational culture as a key factor in discharge improvement efforts are needed.

INTRODUCTION

High-quality handovers at hospital discharge are challenged by an aging population[1], and an increase in chronic and comorbid patients that require frequent and more complicated transitions between hospital and community care services[2].

Continuity of care is essential in ensuring safe and high-quality care transitions[1,3,4]. However, hospital discharge often faces breakdowns in information, communication, and coordination between care providers[5–8]. These breakdowns have serious ramifications for patients. Nearly 20% of hospitalized patients experience an adverse event within 3 weeks of discharge. These events range from minor symptoms to permanent disability and death. Half of the adverse events were deemed preventable or the severity could have been substantially mitigated[9,10]. Moreover, poorly executed handovers contribute to a further increase of unnecessary hospital utilization[11–13], involving higher costs of care[14].

Aspects of organizational culture, or how we providers "do things here" are increasingly appreciated in understanding how best to improve the quality of health care[15,16]. We defined organizational culture as: *the social-organizational phenomena, in terms of behavior or attitudes, that emerge from a common way of sense-making, based on shared values, beliefs, assumptions, and norms*[17–19]. Evidence suggests that organizational culture may be relevant for successful and sustained improvement efforts[20]. However, insights into the role of organizational culture on patient discharge have been limited. The cultural barriers are often hidden in the underlying, (invisible) social constructions and attitudes[21–23] and therefore difficult to identify and assess. A deeper understanding of the relationship between handover problems at hospital discharge and their underlying cultural barriers may contribute to the development and implementation of effective and sustainable interventions to attenuate adverse care events. The objective of this study was to gain insights into the impact of organizational culture aspects on the quality and safety of handovers at hospital to community discharge.

METHODS

Setting and participants

We conducted a prospective, qualitative study of patient handovers at hospital discharge in 5 EU countries. The participating researchers involved in the HANDOVER project represented various types of European health care systems (i.e., the Netherlands, Spain, Poland, Sweden, Italy). The study was performed in 9 hospitals and their community care systems. Four academic and 5 regional community hospitals were selected and represent wide variation in hospital structure, identity, and size (the number of beds varied between 127 and 1042). This study was part of a larger European study (the HANDOVER project, FP7-HEALTH-F2-2008-223409).

The participants studied were stakeholders in the hospital discharge process: patients and/or relatives, and the respective professional care providers (e.g., physicians, nurses) of the recruited patients in the hospital and in primary care. The patients were recruited when they fulfilled the inclusion criteria by the time of discharge from the hospital (table 1). We used purposive sampling to ensure a diversity of patients (i.e., age, sex, diagnosis, hospital setting, and wards) and care providers. The patients or their proxy, if a patient was unable to participate personally because of his/her illness, were asked for written consent. Ethics approval was obtained in each of the 5 study sites.

Table 1. Study population (inclusion and exclusion criteria)

Inclusion	
Patients and/or caregivers	18 years old+ Admitted to internal medicine, pulmonary diseases, cardiology or (vascular) surgical wards Any of the following diagnoses: diabetes mellitus, asthma, COPD, chronic heart failure Prescribed 6+ drugs Recruited consecutively at the point of their hospital discharge Discharged to the community (i.e. home or nursing home)
Hospital physicians and nurses	Internal medicine, pulmonary diseases, cardiology or (vascular) surgical wards
GPs and community nurses	Representing the communities to which the patients were discharged.
Exclusion	
Patients referred to other care units within the hospital prior to their discharge home or discharge to another country.	

GP=general practitioner; COPD=chronic obstructive pulmonary disease.

Data collection

We conducted semistructured individual interviews and focus group interviews using interview guides that were developed during the HANDOVER research meetings. The questions for the individual interviews were pilot tested in each country. The topics that guided the question development are the following:

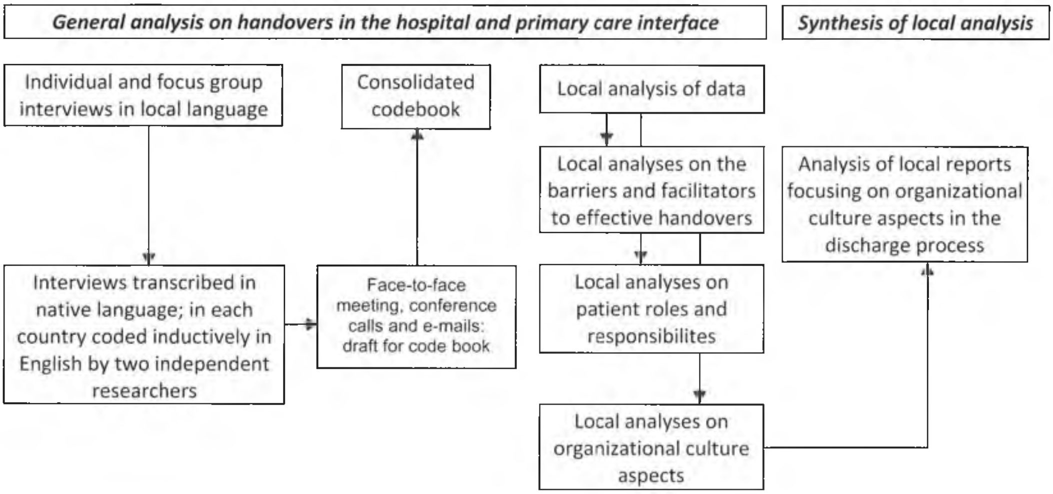
- experiences with recent handovers (appreciative/problematic situations and consequences);
- perceptions about handovers in general (experiences, beliefs, norms, assumptions, methods, tools, barriers, and facilitators);
- perceptions about role taking, tasks, and responsibilities;
- thoughts and suggestions for improving patient handovers.

The individual interviews were conducted with patients who were recently discharged from the hospital to either their home or a nursing home, and with their hospital physician, hospital nurse, general practitioner (GP), and community nurse. Patients were approached before discharge from hospital, received information about the project, and were called after their discharge to schedule the interview (within 3–4 weeks after discharge). The focus group interviews were conducted with various types of stakeholder (i.e., patients and patients' representatives, hospital physicians, hospital nurses, GPs, and community nurses) and varied in size from 3 to 9 participants per group. The focus group interviews were led by an experienced moderator and 1 or 2 observers who took field notes and added prompts. At the end of each focus group, the moderator summarized the information and allowed participants to reflect and comment on the accuracy and validity of this summary[24]. All interviews were audiotaped and transcribed verbatim in the native languages according to a standardized format.

Data analysis

The analysis consists of 2 parts: a general analysis of the interviews and a subanalysis focusing on the role of organizational culture aspects (figure 1).

Figure 1. Procedure from data collection to the synthesis of local analysis



General analysis

The transcriptions of the interviews were analyzed using Grounded Theory[25]. Grounded Theory is based on concepts that emerge as the theory is formed. Two researchers in each country independently coded the transcripts inductively in English to minimize subjectivity. Atlas.ti software version 6.0 (ATLAS.ti Scientific Software Development Company, GmbH, Berlin, Germany) was used to facilitate the coding process. Coding is the interpretative process in which conceptual labels are given to the data[25]. The emerging codes were circulated among researchers in all countries and the list of codes was developed into a codebook, during a face-to-face meeting, conference calls, and electronic mail correspondence. The group agreed about the meaning of the English translation of the developed codes to ensure codebook fidelity. In addition, country-specific codes were created as needed. Regular conference calls were held to refine the codebook as other codes arose during the analyzing process, and to group codes that related to the same phenomenon into categories. Two researchers in each country further analyzed their data until conceptual saturation was reached in each country, that is, no new codes or categories were generated[25]. Researchers from each country (GH, MF, CO, ED-U, and

GT) performed 3 local analyses, with the agreed instructions and the codebook, with different foci on patient handovers in the hospital-primary care interface. The groups reported their findings, including quotes, in English.

Synthesis of local analysis

The reports of 1 local analysis were used to explore the role of organizational culture aspects in the discharge process and were discussed by 2 researchers (GH, HW) that synthesized the local findings on this subject[26]. The categories and themes were identified across the different settings and where checked with the researchers from each country. Additional quotes were provided from each country to illustrate the findings. Finally, according to the Grounded Theory approach of Corbin and Strauss[25], we derived new hypotheses as a result from these data.

RESULTS

A total of 192 individual interviews and 25 focus group interviews were analyzed regarding organizational culture aspects in the 5 countries. Individual interviews were conducted with 53 patients and/or caregivers, 46 hospital physicians, 38 hospital nurses, 39 GPs, and 16 community nurses. Of the patients recruited for the study, 39 could not be interviewed for various reasons (i.e., refused, too sick, or deceased). Individual interviews were evenly distributed across the countries and across ages and genders (table 2).

Table 2. Number of interviews and participants (per country)

Country		**Participants**				
		Patients/family members	*Hospital physicians*	*Hospital nurses*	*General practitioners*	*Community nurses/other*
Individual interviews						
The Netherlands	32	8	8	8	8	-
Spain	30	8	6	5	7	4
Poland	65	23	16	10	13	3
Italy	27	5	7	6	5	4
Sweden	38	9	9	9	6	5
Total number	192	53	46	38	39	16
Focus group interviews						
The Netherlands	5	7	8	5	5	6
Spain	5	3	8	6	9	7
Poland	6	10*	4	7	4	7
Italy	5	9	4	8	7	-
Sweden	5	8	6	6	6	6
Total number	26	37	30	32	31	26

*Two focus group interviews were conducted with patients.

The data analysis resulted in 9 categories from which 3 themes emerged: (I) a fragmented hospital-primary care interface; (II) undervaluing administrative tasks relative to clinical tasks in the discharge process; and (III) lack of reflection on the discharge process or process improvement (table 3).

Table 3. Cultural themes, categories, codes and quotes related to handovers at patient discharge

Theme	Category	Codes	Representative quotes
1. A fragmented hospital-primary care interface	Inward focus of hospital care providers	Care provider responsibility; follow up assessment at discharge; discharge communication; hospital interested in patient after discharge; stress; completeness of information	Hospital physician [NL]: ...if we see there is the pressure that it needs t away...you back down a little bit be Hospital nurse [SW]: Sometimes yo about discharge, and then you feel that much of a choice since there is Hospital physician [PL]: I work in th patient closes the hospital door beh Patient [NL]: You are dumped just li
	Lack of awareness to needs, skills and work patterns of the professional counterpart	Different views of hospital and PC; information needed for handover; clarity of information; lack of knowledge; beliefs about counterpart; uncertainty about follow-up; use of medical language; inadequate follow-up	GP [NL]: They (the hospital physicia GP [SP]: The problem is that they (h worlds. Hospital nurse [SW]: ...it is easy to the EC and the primary care. It is ju work is done at the primary care re hospital. Community nurse [NL]: The hospita insufficient community care. As a c patient returns home, because you requested. Our number of working (...) transporting the patient to the Community nurse [PL]: It (discharg how to move the patient, whether shower (...) Apart from the medical both for a doctor and for a nurse.
	Lack of a collaborative attitude	Professional autonomy; contact with counterpart has no priority; initiative to communicate; formal/ swift communication; difficult access to care provider; self-directive attitude	GP [PL]: ...handover does exist but GP [NL]: The major problem is that difficult. GP [NL]: Well, in 50% of the cases i no communication at all, or the exp GP [SP]: We do not communicate. Hospital nurse [SP]: You invent you assessment.

Theme	Category	Codes	Representative quotes
			Hospital physician [IT]: We are on two different tra discharge reports. We read their referral notes and direction. Patient [SP]: I showed the discharge report (to the me that the information was not useful for her.
	Relationship between hospital and primary care providers	Level of trust; competition; personal contact/ acquaintance between hospital and PC providers; respect; honesty; irritation	Hospital physician [SP]: First of all, we should look a rivals, which is the way we look at each other by no GP [PL]: They provide their recommendations whic specialists and view hospital as superior authority. Community nurse [NL]: At times you get sent away the ward the reaction is often "I will pass it through really happens. Patient [SW]: There is a distance between the hosp his own territory.
2. Undervaluing administrative tasks relative to clinical tasks in the discharge process	Providing care in a 'here and now' situation	Professional identity; prioritizing care	Hospital physician [SP]: When you have surgery yo you cannot do everything (administrative tasks and Hospital physician [NL]: ...surgeons are more like "I something for the patient" and don't feel like sittin letters. Hospital physician [IT]: Problems may emerge whe discharge date. The community care staff has not e but...we are always full with people (patients) and.
	Administrative work considered to be burdensome	Timeliness of information; lack of time; work pressure; medical discharge report	Hospital nurse [NL]: ...you have so many things to c administration...You sometimes tend to set prioriti papers tomorrow" or "This list of the dietician...not
3. Lack of reflection on the discharge process or process improvement	Negative attitude towards feedback	Feedback between hospital and PC; disputes on handovers; negative experiences with feedback; skepticism towards individual feedback	GP [NL]: ...at a certain moment you get tired you k doing it anymore. I have other, more important thi Hospital nurse [IT]: A "good job!" said once in a wh GP [NL]: ...Yeah, and then you start calling again an at all (...) they say: "that's how we do it always".
	Handovers at discharge ruled by habits	Use of handover guidelines; handover based on routines; not educated/ trained on handover	Hospital physician [SW]: I don't know whether ther have learned during the years how it is supposed t Hospital nurse [SP]: We are not thinking about how working in this way and it is just the only way we h

Theme	Category	Codes	Representative quotes
	Appreciating and integrating new practices	Use of ICT; shared information system between hospital and PC; resistance to new practices; confidence in new practices	Hospital nurse [NL]: I hope that we many of us here start to think, "let's from the beginning. Hospital nurse [SP]: ...if I have to lea useful for me, I will not be intereste Hospital nurse [NL]: At forehand, a system, as it already has lead to ma God, here we go again!" (...) Everyb at handovers.

Abbreviations: NL = the Netherlands; SW = Sweden; PL = Poland; IT = Italy, SP = Spain; GP = general practitioner
electronic patient record.

Theme I: A fragmented hospital-primary care interface

Four categories emerged within this theme: inward focus of hospital care providers; lack of awareness to needs, skills and work patterns of professional counterpart; lack of a collaborative attitude; and the relationship between hospital and primary care providers.

Hospital physicians and nurses expressed great care and focus about their own work. Although they consider the continuity of care at the patient handover as important, they seem to be less aware of the implications of the handover process compared with their counterparts in the primary care setting. A main concern within the hospital is to discharge patients quickly so more patients can be admitted. This "inward focus" hinders hospital physicians and nurses to support discharged patients with sufficient after thought or care and to communicate adequately with their primary care counterparts. As a consequence, the quality of information handed over is deficient and limits the ability of GPs to continue care after discharge smoothly.

Physicians and nurses believe that there is a lack of awareness about the different assumptions (mental models) and working patterns of the hospital personnel compared with those in primary care. Hospital physicians and nurses expressed a lack of familiarity with the way follow-up care is organized in the community, the expectations of their primary care counterparts and the informational needs of their primary care counterparts, and also, whether those needs were met during routine patient handovers. This lack of knowledge and limited awareness leads to further breakdowns in communication and information sharing at discharge. A striking example noted is the use of medical abbreviations and acronyms in which the meaning was unknown to the GP (thereby increasing the risk for misinterpretation). According to GPs and community nurses, hospital care providers overestimate the very limited time and resources available to providers in the community setting. Hospital care providers are not sufficiently aware of the complex social context in which home care needs to be organized and resourced, and often take these aspects for granted. GPs and community nurses expressed a sense of urgency about the need to improve the contact with and understanding between hospital and community care providers; they are the ones at the end of the care chain that have to constantly deal with the consequences of inadequate handovers.

Physicians and nurses, in the hospital and community, do not feel they are integral parts of an organized health delivery system (handover network), but regard themselves more as separate entities (actors) with different professional backgrounds in the delivery of care. Handovers at discharge are considered more the result of an individual rather than a collaborative effort. Communication is reduced to giving and receiving information and instructions rather than a shared decision-making process regarding the most effective patient follow-up. Hospital physicians and nurses admit difficulties with taking up the initiative to improve their coordination of patient care. For instance, calling the GP or community nurse is not integrated in their work flow. When communication at discharge does occur, it is considered to be quite formal and brief.

It is widely acknowledged that important communication issues remain unspoken and taken for granted.

Hospital and primary care providers expressed their relationships as formal and distant, and at times as negative as well, although there were country-specific differences (table 4). This "cool" relationship hinders the trust required for effective communication and collaboration in terms of getting things done easily and addressing or disclosing problems. They also noted that contact with their colleagues in primary care is less personal and direct. Moreover, community nurses felt that they are not always taken seriously or approached very respectfully by hospital nurses, which undermines their trust and affects future attitudes during handovers at hospital discharge.

Table 4. Country-specific examples of hospital to primary care provider relationship

Netherlands, Sweden and Italy	Physicians and nurses argued that a closer relationship with counterpart colleagues is more likely in a regional hospital than in a large, academic hospital with constantly new and rapidly shifting personnel.
Spain	Physicians and nurses described feelings of rivalry and prestige as barriers for discharge communication and collaboration.
Poland	Hospital care physicians and nurses are perceived to be a higher authority than their colleagues in primary care. Their decisions, recommendations and other information at discharge are 'sacred' and not challenged.

Theme II: Undervaluing administrative tasks relative to clinical tasks in the discharge process

There were 2 closely related categories under this theme: providing care in a "here and now" situation; and administrative work considered to be burdensome.

Health care providers referred to their professional identities by expressing that they became a physician or nurse to provide patient care and not to work as an administrator. This belief has become more acute with the increased focus on productivity, constant time pressure, and a heavy patient workload. Physicians and nurses at the hospital and primary care levels argued that often there is not enough time to fulfill both roles. Administrative duties (e.g., planning discharge, writing letters, making phone calls, organizing community care) therefore become a secondary priority.

Essential administrative activities are postponed and pile up unattended. Documentation needs to be completed in a rush, or the follow-up care is organized at the very last moment. These tasks are often delayed, suboptimal, or not done at all. Hospital physicians and nurses describe many situations where they missed or forgot to handover essential information (within a reasonable time period), because they were too busy with other more pressing patient care activities.

Care providers in Poland expressed a stronger motivation to complete the discharge letter/chart on time compared with the other countries. This is a result of legal and reimbursement obligations that have socialized providers to prioritize these essential steps.

Theme III: Lack of reflection on the discharge process or process improvement

Three categories emerged related to this theme: negative attitude toward feedback; handovers at discharge ruled by habits; and (appreciating and) integrating new practices.

The experiences with one-to-one professional feedback between hospital and primary care concerning a patient's handover at discharge are rare. The interviews demonstrated that feedback is not often considered or simply is not always feasible because of time constraints or lack of accessibility. In Poland, feedback is also believed to be inappropriate as community care providers often perceive medical or nursing discharge letters as a superior, undisputed reference. Physicians and nurses were skeptical toward giving and receiving feedback, because their past experiences were disappointing. They did not experience mutual respect nor did they consider that their opinion about the patient was appraised as adding value. There were also physicians and nurses who reported having only negative experiences such as pinpointing and blaming each other.

Health care professionals have not been trained on how to perform optimal or evidence-based handover practices at discharge (i.e., guidelines, checklists, instructions). In fact, handover is not taught in a structured manner with the expectation that it will be learned implicitly. Handover practices seem to be mostly based on heuristics that have developed and been integrated into their professional work along the way.

Physicians and nurses reported that successfully integrating innovative handover practices will require the right mindset, openness to learn new working routines, confidence in the added value, and regular practice of these skills. Physicians and nurses expressed stories about themselves and colleagues remaining stuck in old working patterns, because they do not want to change their habits or find it difficult to cope with new practices such as working with computers or new, constantly changing software. Dutch and Spanish physicians indicated that the willingness to integrate new handover practices into their working system is also a matter of age. According to them, the younger hospital physicians seem often less resistant and are also better in adapting to new working or communication methods, that often involve information technology.

DISCUSSION

Hospital and community care providers, patients and relatives associated quality and safety of handovers at hospital discharge with many aspects of organizational culture (i.e., the social behavior and the underlying shared values, beliefs, assumptions, and norms of health care providers in the hospital and community). Our findings indicate that hospital and primary care providers, both members of the same virtual "handover organization", have separate "professional tribes" and have different, often incompatible values and beliefs that threaten to undermine the effectiveness and safety of patient transitions[27,28]. Although this is a known source for potential discontinuities of care within health institutions[15,29], and within primary care[30], this emerging realization is key to addressing ineffective handovers at hospital discharge[31]. Our findings also highlight weaknesses in the relationships of shared goals, shared knowledge, and mutual respect between hospital and community-based health care providers. These "relational dynamics" are associated with a lack of frequent, timely, accurate, and problem-solving communication, in turn predicting low levels of quality and efficiency[32–34]. Ensuring continuity of care at discharge does not seem to be a main concern for hospital-based care providers as long as they are not aware and do not experience the untoward consequences of the handover. Furthermore, the professional duty of providing care prevails in minds of care providers and takes precedence over dealing with administrative coordination of care. This finding may best be understood in terms of a "professional-bureaucratic work conflict"[35,36]. The inherent conflict between the professional and the bureaucratic organizational goals and values result in competing pressures and loyalties ultimately leading to a prioritization of one goal at the expense of the other[37]. Finally, provider skepticism and lack of respect toward providing feedback are major causes for not giving and receiving structural feedback. Physicians and nurses are less willing to confront each other with handover inefficiencies and take current handover practices for granted. In line with the findings of other studies[33,38], these attitudes may prevent learning from occurring and thereby may contribute to an unsafe discharge environment. A safe discharge environment is also challenged by the care provider's sense of having insufficient experience-based training on how to do effective handovers at discharge. Earlier studies confirm our reports about a lack of actual handover training or the routine use of standardized guidelines on patient handover[37,39].

We have several suggestions for improving handovers at hospital discharge. Changing attitudes may be enhanced through local and collaborative learning meetings between hospital and primary care providers to understand each other's competencies (regarding knowledge, skills, and possibilities), and to improve the mutual agreement and understanding of follow-up care expectations. Our second suggestion for improvement is to provide educational and training programs to address new best practices and link the rationale for a new practice change to patient safety and efficiency goals[40]. In this way, the hospital and primary care providers may better understand how their own thinking and actions impact quality and safety[41]. Teaching could be enriched by the use of stories or "vignettes" both meaningful and memorable to staff, because they demonstrate the direct link between handover processes and their effects on patient care[41,42]. Furthermore, we suggest the use of (electronic) mandatory fields for creating discharge letters. Electronic reminders may enhance timely and appropriate information exchange and discharge planning[43].

Our study has several limitations. The impact of organizational culture on patient handovers at hospital discharge was analyzed and compared between the 5 countries in the study. Each country has their own distinct health care delivery systems, comprising unique legislative and organizational characteristics, and within different clinical settings. Although the themes seemed to be consistent across the 5 countries and the influence of the varying systems on the findings were frequently discussed during regular face-to-face meetings or through e-mail correspondence in the period of data collection and analysis, the local and specific impacts of these cultural barriers may have been under appreciated. Second, the interviews were transcribed in the respective native language of the 5 countries. This may have increased the chance for variations in the interpretation of our data[44]. We made all efforts to ensure methodological rigor and validity of the translations from English to native language across the study sites by using a standardized codebook, meeting frequently, sharing and comparing our results, and by performing a pilot analysis. Throughout the study, 2 senior qualitative researchers (JKJ and MV-D) conducted an ongoing internal quality audit, adapted from Mays and Pope[45], and from Tong et al.[46], to determine whether the data were collected, analyzed, and reported correctly according to the study protocol.

We believe that the present study has considerably advanced our understanding of the influence of organizational culture. The use of individual and focus group interviews provide valuable insights into the social behavior and the underlying shared values, beliefs, assumptions, and norms of health care providers in the hospital and community. These constructs are difficult to identify and assess by quantitative research methods alone, and often, by not appreciating their impact, we can undermine the success of clinical interventions[47,48]. On the basis of the data, we hypothesize that the extent to which health care providers, in particular within the hospital, value handovers as an important aspect of their clinical work aimed at ensuring continuity of their patient's care and the extent to which they integrate this value in handover practice by developing an outward view, a collaborative attitude, knowledge to anticipate the needs of their counterparts, administrative compliance, giving and receiving feedback, and integrating new practices, is critical to effective hospital discharge. In particular, we hypothesize that a shared goal to ensure continuity of care, shared knowledge, and mutual respect between hospital and community-based health care providers in the discharge process would increase frequent, timely, accurate, and problem-solving discharge communication, and in turn improve the quality and efficiency of hospital discharge. The theory of relational coordination provides a practical framework to measure these relational dynamics between hospital and community health care providers in the discharge process, and their association with the quality of the discharge process (i.e., frequent, timely, and accurate discharge communication) and quality of care outcomes[32,33]. We urge future studies to test this model in assessing the impact and implementation of handover practices.

REFERENCES

1. Clare J, Hofmeyer A. Discharge planning and continuity of care for aged people: indicators of satisfaction and implications for practice. Aust J Adv Nurs 1998;16:7–13.
2. Mistiaen P, Duijnhouwer E, Wijkel D, et al. The problems of elderly people at home one week after discharge from an acute care setting. J Adv Nurs 1997;25:1233–40.
3. Halasyamani L, Kripalani S, Coleman E, et al. Transition of care for hospitalized elderly patients development of a discharge checklist for hospitalists. J Hosp Med 2006;1:354–60.
4. Arora VM, Prochaska ML, Farnan J, et al. Problems after discharge and understanding of communication with their pcps among hospitalized seniors: a mixed methods study. J Hosp Med 2010;5:385–91.
5. Kripalani S, LeFevre F, Philips CO, et al. Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. JAMA 2007;297:831–41.
6. Moore C, McGinn T, Halm E. Tying up loose ends: discharging patients with unresolved medical issues. Arch Intern Med 2007;167:1305–11.
7. Boockvar K, Fishman E, Kyriacou CK, et al. Adverse events due to discontinuations in drug use and dose changes in patients transferred between acute and long-term care facilities. Arch Intern Med 2004;164:545–50.
8. McKenna H, Keeney S, Glenn A, et al. Discharge planning: an exploratory study. J Clin Nurs 2000;9:594–601.
9. Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161–7.
10. Forster AJ, Clark HD, Menard A, et al. Adverse events affecting medical patients following discharge from hospital. CMAJ 2004;170:345–9.
11. Hoonhout LH, de Bruijne MC, Wagner C, et al. Direct medical costs of adverse events in Dutch hospitals. BMC Health Serv Res 2009;9:27.
12. Murtaugh CM, Litke A. Transitions through postacute and long-term care settings: patterns of use and outcomes for a national cohort of elders. Med Care 2002;40:227–36.
13. Crotty M, Whitehead CH, Wundke R, et al. Transitional care facility for elderly people in hospital awaiting a long term care bed: randomized controlled trial. BMJ 2005;331:1110.
14. Friedman B, Basu J. The rate and cost of hospital readmissions for preventable conditions. Med Care Res Rev 2004;61:225–40.
15. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the Twenty-First Century. Washington, DC: National Academy Press, 2001.
16. Boan D, Funderburk F. Health care quality improvement and organizational culture. Easton, MD: Delmarva Foundation, 2003.
17. Schein EH. Organisational Culture and Leadership. 2nd ed. San Francisco: Jossey-Bass, 1992.
18. Brown A. Organizational Culture. London: Pitman Publishing, 1995.
19. Bolman LG, Deal TE. Reframing Organisations: Artistry, Choice and Leadership. San Francisco, CA: Jossey-Bass, 1997.
20. Scott T, Mannion R, Marshall M, et al. Does organisational culture influence health care performance? A review of the evidence. J Health Serv Res Policy 2003;8:105–17.
21. Bate SP. Strategies for Cultural Change. Oxford: Elsevier Science & Technology, 1994.
22. Weick KE. Sensemaking in Organizations. Thousand Oaks, CA: Sage, 1995.
23. Davies H, Nutley S, Mannion M. Organisational culture and quality of health care. Qual Health Care 2000;9:111–9.
24. Cohen DJ, Crabtree BF. Evaluative criteria for qualitative research in health care: controversies and recommendations. Ann Fam Med 2008;6:331–9.
25. Corbin J, Strauss A. Grounded theory research: procedures, canons, and evaluative criteria. Qual Sociol 1990;13:3–21.
26. Zimmer L. Qualitative meta-synthesis: a question of dialoguing with texts. J Adv Nurs 2006;53:311–8.
27. Martin J. Culture in Organizations: Three Perspectives. New York: Oxford University Press, 2010.
28. Parker M. Organizational Culture And Identity; Unity and Division at Work. London: Sage Publications, 2010.
29. Krogstad U, Hofoss D, Hjortdahl P. Continuity of hospital care: beyond the question of personal contact. BMJ 2002;324:36–8.

30. Shaw A, de Lusignan S, Rowlands G. Do primary care professionals work as a team: a qualitative study. J Interprof Care 2005;19:396–405.
31. Gittell JH, Weiss L. Coordination networks within and across organizations: a multi-level framework. J Manage Stud 2004;41:127–53.
32. Gittell JH, Weinberg D, Pfefferle S, et al. Impact of relational AQ8 coordination on job satisfaction and quality outcomes: a study of nursing homes. Hum Resource Manage J 2008;18:154–70.
33. Gittell JH, Fairfield KM, Bierbaum B, et al. Impact of relational coordination on quality of care, postoperative pain and functioning, and length of stay: a nine-hospital study of surgical patients. Med Care 2000;38:807–19.
34. Weinberg D, Gittell JH, Lusenhop W, et al. Beyond our walls: impact of patient and provider coordination across the continuum on outcomes for surgical patients. Health Serv Res 2007;42:7–24.
35. Scott WR. Professionals in bureaucracies—areas of conflict. In: Vollmer HH, Mills DL (eds). Professionalization. Englewood Cliffs: Prentice-Hall, 1966.
36. Johnson ND. The professional-bureaucratic conflict. J Nurs Adm 1971;1:31–9.
37. Connolly M, Grimshaw J, Dodd M, et al. Systems and people under pressure: the discharge process in an acute hospital. J Clin Nurs 2009;18:549–58.
38. Gittell JH. Relational coordination: coordinating work through relationships of shared goals, shared knowledge and mutual respect. In: Kyriakidou O, Ozbilgin M (eds). Relational Perspectives in Organizational Studies: A Research Companion. Cheltenham, UK: Edward Elgar Publishers, 2006.
39. Raduma-Tomas MA, Flin R, Yule S, et al. Doctors' handovers in hospitals: a literature review. Qual Saf Health Care 2011;20:128–133.
40. Riesenberg LA, Leitzsch J, Little BW. Systematic review of handoff mnemonics literature. Am J Med Qual 2009;24:196–204.
41. Clarke CM, Persau DD. Leading clinical handover improvement: a change strategy to implement best practices in the acute care setting. J Patient Saf 2011;7:11–8.
42. Weick K, Sutcliffe K. Managing the Unexpected: Resilient Performance in an Age of Uncertainty. San Francisco, CA: John Willey & Sons, 2007.
43. Shepperd S, Parkes J, McClaren J, et al. Discharge planning from the hospital to home. Cochrane Database Syst Rev 2010;CD000313.
44. Larkin PJ, Dierckx de Casterlé B, Schotsmans P. Multilingual translation issues in qualitative research: reflections on a metaphorical process. Qual Health Res 2007;17:468–76.
45. Mays N, Pope C. Qualitative research in health care. Assessing quality in qualitative research. BMJ 2000;320:50–2.
46. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care 2007;19:349–57.
47. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. Lancet 2003;362:1225–30.
48. Shekelle PG, Pronovost PJ, Wachter RM, et al. Advancing the science of patient safety. Ann Intern Med 2011;154:693–6.

Chapter 4

Are patients discharged with care? A qualitative study of perceptions and experiences of patients, family members and care providers

Gijs Hesselink
Maria Flink
Mariann Olsson
Paul Barach
Ewa Dudzik-Urbaniak
Carola Orrego
Giulio Toccafondi
Cor Kalkman
Julie Johnson
Lisette Schoonhoven
Myrra Vernooij-Dassen
Hub Wollersheim

BMJ Quality and Safety 2012;21:i39-i49.

ABSTRACT

Background: Advocates for quality and safety have called for healthcare that is patient-centered and decision-making that involves patients.

Objective: The aim of the paper is to explore the barriers and facilitators to patient-centered care in the hospital discharge process.

Methods: A qualitative study using purposive sampling of 192 individual interviews and 26 focus group interviews was conducted in five European Union countries with patients and/or family members, hospital physicians and nurses, and community general practitioners and nurses. A modified Grounded Theory approach was used to analyze the data.

Results: The barriers and facilitators were classified into 15 categories from which four themes emerged: (I) healthcare providers do not sufficiently prioritize discharge consultations with patients and family members due to time restraints and competing care obligations; (II) discharge communication varied from instructing patients and family members to shared decision-making; (III) patients often feel unprepared for discharge, and postdischarge care is not tailored to individual patient needs and preferences; and (IV) pressure on available hospital beds and community resources affect the discharge process.

Conclusions: Our findings suggest that involvement of patients and families in the preparations for discharge is determined by the extent to which care providers are willing and able to accommodate patients' and families' capabilities, needs and preferences. Future interventions should be directed at healthcare providers' attitudes and their organization's leadership, with a focus on improving communication among care providers, patients and families, and between hospital and community care providers.

BACKGROUND

Patient-centeredness has been advocated as a necessary element of high-quality healthcare[1–8]. The US Institute of Medicine endorsed patient-centeredness in 2001 as one of six goals for improving healthcare and as a powerful answer to address deficits in health systems in responding to patient-specific needs, preferences and values[9]. Although a widely accepted definition of patient-centeredness is lacking[5–8], most studies focus on aspects of understanding and respecting the patients' individual values, needs and desires; involving patients and family members in the care process, patient education and creation of shared knowledge; and physical and emotional comfort and support[10–15]. Berwick described three maxims of patient-centeredness: (1) 'The needs of the patient come first'; (2) 'Nothing about me without me' (i.e., transparency and involvement of patients and family members in each clinical decision and in the design of the care process and services); and (3) 'Every patient is the only patient' (i.e., a customization of care at the level of the individual)[16].

Patient-centered care is considered to be especially important during critical episodes in the care process such as during discharge from the hospital. The growing emphasis on shorter hospital stays demands more postdischarge care and creates an important coordinating and management role for patients and family members[17]. Often, patients and family members are the only common thread between hospital and community care services[18]. Patients and family members require skills, information and confidence to ensure continuity in postdischarge care[18]. Patients at discharge are often in a vulnerable state: they are anxious, have side effects from medication, and may have functional or cognitive impairment[18–20]. Discharge can also be an intense episode in the care process where patients and family members are not ready to care for the patient at home, and are confronted with difficult decisions and changes (e.g., financially and emotionally) that impact their home setting and resources.

Patients, despite the recently increased focus on patient-centeredness, often leave the hospital unprepared for postdischarge demands[21–23]. A recent survey of patients with complex care needs in 11 countries reported that one in four did not receive instructions for follow-up nor did they receive clear medication directions[24]. Other studies have demonstrated that patients and family members express anxiety and a sense of abandonment after discharge[25–27]. Patient unpreparedness, anxiety and a misunderstanding of the full ramifications of their situation at discharge are believed to increase hospital readmissions and adverse events in the posthospital setting. This is especially the case for the elderly and those with chronic conditions who require frequent transitions between hospital and home care[28–31].

There is little understanding about the factors that facilitate or create barriers to patient-centered care at hospital discharge. Identifying the barriers and facilitators may help in the design of effective solutions for improving the discharge process. This may improve patients'/families' self-care skills (e.g., improving medication adherence), mitigate patient anxiety, and reduce avoidable and costly readmissions.

The aim of this study was to explore the barriers and facilitators to patient-centered care in the hospital discharge process. We elicited perceptions and experiences about the discharge process through interviewing patients, family members and care providers (in the hospital and the community).

METHODS

Study design and settings

We conducted a qualitative study of patient handovers at hospital discharge in nine hospitals, and their community care settings, as part of the HANDOVER project, which addresses patient handovers at the hospital to primary care interface in five European nations[32]. The countries involved in the HANDOVER project (The Netherlands, Spain, Poland, Italy and Sweden) represent a wide variety and types of European healthcare and funding systems. Four academic or teaching hospitals and five regional community hospitals representing all five nations were selected to ensure the sample reflected a wide variation in hospital type, size and structure. Hospitals varied in size from 127 to 1042 beds.

Participants

Participants in the study were stakeholders in the discharge process, including patients and family members (if available), and healthcare providers (physicians, nurses) of the recruited patients at the hospital and community care settings. Patients recruited fulfilled both the general and country-specific inclusion criteria (table 1). We used purposive sampling to ensure diversity of patients (i.e., age, gender, diagnosis, hospital setting and wards) and healthcare professionals. The patients or their proxy, if a patient was unable to participate personally due to his/her illness, were asked for written consent. Ethics approval was received at each of the five study sites. The providers were identified based on the patients they cared for and were then informed about the study and requested to participate.

Development of interview formats

The interview guides for the individual and focus group interviews were developed during several HANDOVER Research Consortium meetings[33]. The questions for the individual interviews were pilot-tested and refined in each country and the results were used to create the final guide. Topics that guided the question development were:

- Experiences with recent discharge processes (appreciative/problematic situations and consequences)
- Perceptions about the discharge process in general (i.e., experiences, beliefs, norms, assumptions, methods, tools, barriers, facilitators)

- Perceptions about role taking, tasks and responsibilities
- Thoughts and suggestions for improving the discharge process.

Table 1. Study population inclusion and exclusion criteria

Study population	General inclusion	Country-specific inclusion
Patients and/ or family members	18 years old+ Any of the following diagnoses: diabetes mellitus, asthma, COPD, chronic heart failure and/ or prescribed 6+ drugs Recruited consecutively at the point of their hospital discharge Discharged to the community (i.e., home or nursing home)	*The Netherlands:* patients admitted to internal medicine, pulmonary diseases, cardiology or (vascular) surgical wards *Spain:* patients belonging to cultural minority groups with limited health literacy (capacity to read, write, and understand healthcare information) *Poland:* patients ≥ 60 of age *Italy:* patients admitted to emergency ward *Sweden:* patients admitted to emergency ward from emergency room. If living at a nursing home, only within a geographically specified area
Hospital physicians and nurses	Internal medicine, pulmonary diseases, cardiology or (vascular) surgical wards	
GPs and community nurses	Representing the communities to which the patients were discharged.	

Exclusion criteria: Patients referred to other care units within the hospital prior to their discharge home or discharge to another country.
GP= general practitioner; COPD=chronic obstructive pulmonary disease.

Data collection

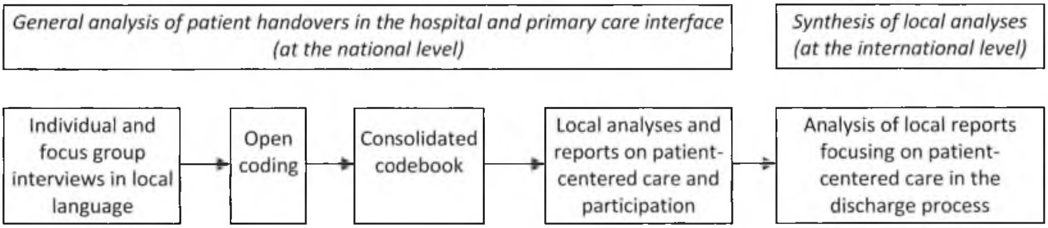
The individual interviews were conducted with patients recently discharged from the hospital to the community (i.e., nursing home or home) and with their hospital physician, hospital nurse, general practitioner (GP) and community nurse involved in the discharge process. Patients were approached before their discharge from the hospital, and provided with information about the project, and the interviews were performed 3–4 weeks after discharge by two local research team members. All interviewers had experience and/or background in healthcare as researchers or as healthcare providers.

The focus group interviews were conducted separately with each stakeholder group, and varied in size from three to nine participants. The interviews were led by a trained moderator and one or two observers that completed field notes and added question prompts as needed. At the end of each focus group, the moderator summarized the discussion and allowed the participants to reflect and comment on the accuracy and validity of the information[34]. All interviews were audio-taped and transcribed in the native languages according to a standardized format.

Data analysis

The analysis consisted of two parts: the general analysis at the national level of the interviews and a subanalysis of the cross national data (figure 1).

Figure 1. Procedure – from data collection to the sub-analysis



General analysis

The transcribed interviews were analyzed using Grounded Theory, a qualitative research method focused on the identification of concepts that emerge from study interviews or observation[35]. Two researchers in each country independently coded the transcripts to minimize subjectivity. Atlas.ti software V.6.0 (ATLAS.ti Scientific Software Development Company, GmbH, Berlin, Germany) was used to facilitate the coding process. Coding is the interpretative process in which conceptual labels are given to the data[35]. The generated codes were circulated between researchers in all countries and the list of codes was developed into a shared codebook, during a face-to-face meeting, conference calls and electronic mail correspondence (available upon request). Agreement about the meaning of the in English developed codes was achieved before the analysis stage. Regular conference calls were held to refine the codebook as codes arose during the analyses and to group the codes that were related to the same phenomenon into unique categories. Country-specific codes were used as needed. The same two researchers further analyzed the data in each country until conceptual saturation was reached for that country, that is, no new codes or categories were generated[35].

Synthesis of local analysis

Local analyses were used to report on patient-centered care and the culture[36] and to explore the barriers and facilitators to patient-centered care in the discharge process. Three researchers (GH, HW and MF) synthesized these findings[37]. The categories and themes identified across the different settings were verified with the researchers from each country and an additional number of quotes from each country were provided to illustrate the findings. Finally, new hypotheses emerged as a result of the data from the local analyses[34].

RESULTS

Overall, 192 individual interviews and 26 focus group interviews were analyzed regarding patient-centered care in the discharge process of the five countries. Individual interviews were conducted with 46 hospital physicians, 38 hospital nurses, 39 GPs and 16 community nurses. 53 patients and/or family members were interviewed. Of the patients recruited, 39 could not be interviewed for various reasons. The individual interviews were evenly distributed across the countries (table 2) and across age and gender groups.

Table 2. Number of interviews and participants (per country)

Country		Participants				
		Patients/family members	*Hospital physicians*	*Hospital nurses*	*General practitioners*	*Community nurses/other*
Individual interviews						
The Netherlands	32	8	8	8	8	-
Spain	30	8	6	5	7	4
Poland	65	23	16	10	13	3
Italy	27	5	7	6	5	4
Sweden	38	9	9	9	6	5
Total number	192	53	46	38	39	16
Focus group interviews						
The Netherlands	5	7	8	5	5	6
Spain	5	3	8	6	9	7
Poland	6	10*	4	7	4	7
Italy	5	9	4	8	7	-
Sweden	5	8	6	6	6	6
Total number	26	37	30	32	31	26

*Two focus group interviews were conducted with patients.

The analysis resulted in 15 categories from which four themes emerged: (I) health provider prioritization of discharge consultations; (II) decision-making within the discharge process; (III) care provider anticipation of patient-specific needs and preferences; and (IV) organizational factors (table 3).

Theme I: care provider prioritization of discharge consultations

There are three categories within this theme: lack of time; giving priority to delivering medical or nursing care; and lack of a standard discharge consultation.

Lack of time

The main concern for hospital physicians is delivering optimal medical care to patients, either for inpatients or outpatients. Hospital care providers, patients and their family members considered it important to complete the discharge consultations with the patient and family members during the hospitalization period, and to discuss patient preferences and follow-up needs. Healthcare providers indicated that a barrier to optimal discharge consultations with patients and family members is a lack of time, with discharge often delegated to nurses or junior physicians. The consultations also take place at times that are convenient for the physicians, and these times often conflict with family member availability, which prevents them from being sufficiently informed.

Table 3. Themes, categories and quotes related to handovers at patient discharge

Theme	Category	Representative quotes
I. Care provider prioritization of discharge consultations	A lack of time	*Hospital physician: ...sometimes the discharge instructions do intern is busy again or is called for an emergency. Meanwhile t at a certain moment you have to let the patient go.* *Hospital nurse: There are communication gaps due to the rush like to ask a question, but (...) the physicians are in the operati*
	Giving priority to delivering medical or nursing care	*Hospital physician: Our scope is restricted to pure medical care patients are discharged.*
	Lack of a standard discharge consultation	*Hospital nurse: There is no specific discharge consultation with patients during the whole day, but there is no specific moment organized this and that".* *GP: There are patients that are discharged and start complain physician for two weeks and suddenly were informed with: "yc day there was no consult with the physician on duty. Nothing,* *Patient: I just had to pack my belongings, say "goodbye" and t*
II. Decision-making within the discharge process	Involving patients in decisions regarding their follow-up	*Patient: Three physicians arrived at my bed. My physician, the like: "your treatment here is over. We found a follow-up locati force you (...) they are a bit authoritarian.* *Community nurse: It is important to be sensitive to patient nee It would be better if everyone, starting with the hospital physi needed.*
	Dealing with competing interests	*Hospital physician: I will never keep the patient here against h a nursing home and even though the family (...) and nurses say he will fall at home" (...) this person has the right to go home v patient's autonomy.* *Hospital nurse: I understand when a patient says: "I will not to own responsibility. Unfortunately we often see such patients r unfortunately this happened in this case as well, because the p medicines...that's his own choice. (...) It [influence] stops when*
III. Care provider anticipation of patient-specific needs and preferences	Estimating patients' resources, capabilities and skills	*Patient: After the amputation of my toes I was sent home with told to treat this by myself. (...) I got one bleeding after the oth* *Community nurse: In several occasions patients have been dis their insulin treatment, resulting in patients not receiving insu that the ward personnel thinks that these patients can manag are all well functioning while, in reality, they suffer from deme*

Theme	Category	Representative quotes
	Patient emotions and emotional support	*Relative: It was clear that my mother was frigh understanding would have made it much easie discharge, but it was a real technical-medical forward to go home"?* *Patient: It was not possible to ask something b the right moment, later...".*
	Patient preparedness for discharge	*GP: I often hear from patients that they were go home".* *Hospital nurse: As soon as we talked about go asthma attack. We strongly had the feeling th these patients quickly return to the hospital. I apparently not with the right preconditions. Fo patients back on the inhaler. (...) Now it often morning, are discharged in the midday and ha while we did not see if they switch easily. And*
	Quality of information provided at discharge to patients and family members	*Relative: We came back home with all this dru was supposed to last.* *GP: The hospital does not understand that info see patients arriving here with a complete set confuses or scares them. You should explain th* *Patient: So, the cardiologist stood next to me Latin!* *Hospital nurse: I always study the discharge le outpatient clinic appointment (...) and then al* *Hospital nurse: We can improve ourselves in c demonstrate that they can do the things they*
	Exchange of patient-specific information between hospital and community care providers	*Community nurse: A hospital should inform us alone. These are elderly, sometimes with deme patient has already forgotten half of that whe* *Hospital Physician: We sometimes give inform discharge and the community nurse does not* *Community nurse: We see patients leaving the ulcers...and not a soul knows about that! Until*
	Community care providers' role in monitoring patients after discharge	*Patient: To be honest I did not receive any call*

Theme	Category	Representative quotes
IV. Organizational factors	Shift work structures of hospital care providers	*Hospital physician: The lack of consultations with patients and schedules of the attending physicians at the ward. (...) We hav shifts. (...) The physician who takes over also needs time to get the information exchanged is not sufficient, because you do no* *Patient: You constantly see new physicians (...) it makes you cr not know who you need.*
	Accessibility of hospital care providers to patients	*GP: I think a patient should have better access to the physician when this patient is recently discharged and still has a questio odd that he is advised to contact the GP. At the outpatient clin physician".*
	Pressure on available hospital beds	*Hospital nurse: Sometimes you feel that the hospital physician and then you feel that it is actually a little bit too early, actual choice since the pressure is high.* *Hospital nurse: If a physician needs a hospital bed during the patient without any notification.*
	Discharges on weekends	*Patient: At Friday they told me that I could go home the next Saturdays and they could not give me all the proper discharge was not pleasant. (...) So I did the medication and all other thi*

Abbreviations: GP=general practitioner; COPD=chronic obstructive pulmonary disease

Giving priority to delivering medical or nursing care

The responsibility to provide medical and nursing care to many patients and the interruptions by emergency admissions often leave care providers with insufficient time to talk with patients before they leave the hospital. Hospital nurses expressed that discharge consultations are frequently held in a rush just before patients leave the hospital, increasing the risk that important patient follow-up needs are missed or insufficiently addressed in the discharge process and the handover documentation prepared for community physicians and nurses. Patients then leave the hospital with incomplete information about care following the hospitalization, including instructions for self-management.

Lack of a standard discharge consultation

Hospital physicians, nurses and GPs, frequently noted that at times a standard discharge consultation with patients and family members is not performed at all, especially for patients on surgical wards. Instead, the discharge information is provided piecemeal and in between other care activities. Consequently, patients, especially the elderly, often are not aware of the importance of the information provided, unable to remember the information and overwhelmed when they are suddenly told they have to leave the hospital.

Theme II: decision-making within the discharge process

Two categories emerged under this theme: involving patients in decisions regarding their follow-up; and dealing with competing interests.

Involving patients in decisions regarding their follow-up

Comments on the involvement of patients in discharge handover decisions and decisions concerning follow-up varied widely. Some patients expressed that they had a voice in the choice of a nursing home or rehabilitation center, whereas others felt they were ignored and only asked to follow their physicians' and nurses' instructions.

Patients experienced the decision about the timing of the discharge in varied ways. Several patients expressed that when they expressed that they did not feel ready to go home, they were allowed to stay in the hospital. Others felt they did not have any say in this matter or their requests were ignored. Patients and GPs mentioned instances of sudden and abrupt discharge that overwhelmed patients.

Dealing with competing interests

Physicians and nurses reported they face situations where patient preferences (e.g., remaining in the hospital, not wanting to go to a nursing home) are in conflict with their medical, nursing needs or the administrative pressure of vacating hospital beds for other patients. Hospital physicians and nurses indicated that these problems may result in avoidable readmissions.

Theme III: care provider anticipation of patient-specific needs and preferences

Six categories emerged around this theme: estimating patients' resources, capabilities and skills; patient emotions and emotional support; patient readiness for discharge; quality of information provided at discharge to patients and family members; exchange of patient-specific information between hospital and community care providers; and community care providers' role in monitoring patients after discharge.

Estimating patients' resources, capabilities and skills

Patients and community care providers commented that patient-specific resources, self-management capabilities and skills are often overestimated or not critically assessed. As a result, patients may be discharged without sufficient medications or other supplies, or without detailed instructions to the patient or carers for how to perform simple procedures such as changing a wound dressing.

Patient emotions and emotional support

Hospital nurses in particular recognized the need for emotional support for patients at discharge. In contrast, patients and family members mentioned that there was little awareness of the patient's emotional status and needs by care providers, who rarely demonstrated compassion, efforts to listen to the patient, and to reassure patients and families about their concerns. Patients and family members perceived this as a small time investment from care providers and commented that hospital physicians and nurses appeared to focus primarily on medical or nursing needs. Care providers commented on lack of time and normal care routines as barriers to more effectively addressing the emotional needs of patients and family members.

Patient preparedness for discharge

Care providers commented on the value of preparing patients for discharge, particularly those who need to perform more complex or technical care at home, and that more attention should be paid to encouraging patients to effectively perform monitored self-care activities in the hospital before discharge. However, patients and GPs also mentioned examples of sudden and abrupt discharge that overwhelmed patients. On the other hand, healthcare providers mentioned situations where they tried to prepare patients for discharge by informing them early in the day or hospitalization about the expected discharge date or, if possible, by prolonging the hospital stay.

Quality of information provided to patients and family members

Hospital and community nurses, GPs and patients indicated that patients often receive insufficient instructions concerning their follow-up. For example, a patient who was required to inject a medication at home noted that no instructions or demonstration of how to inject the medication had been given before discharge. Information provided at discharge is often perceived to be unclear or it is given too fast with no time for questions or clarifications. Patients reported that healthcare professionals often used medical-technical jargon they were unable to understand, and community care providers reported that patients received an overload of non-prioritized written and verbal information at discharge, which lead to confusion and prevented patients from remembering key aspects of their follow-up care. Hospital nurses described various approaches to improve clarity of information and to ensure patients understood the most important aspects relevant to follow-up, including involving family members in discharge process, demonstrating and monitoring self-care activities, checking if patients understood the information and highlighting the important information in a discharge letter.

Exchange of patient-specific information between hospital and community care providers

Community care providers noted that the timely exchange of patient-specific information is important and supports anticipating patient preferences and needs at discharge. Descriptions of patients' social and emotional status (i.e., living alone, dementia symptoms, depression, agitation) were reported to be important in addressing specific follow-up care needs. Several community care providers noted that this type of key information often is not present or deficient.

Community care providers' role in monitoring patients after discharge

Finally, patients and GPs believe it is important that community care providers check with patients whether there are unresolved issues to be dealt with. Patients indicated that this frequently does not happen and GPs concurred. GPs admitted this likely has to do with a lack of time and resources.

Theme IV: organizational factors

Four categories related to this theme: shift work structures of the hospital care providers; accessibility of hospital care providers to patients; pressure on available hospital beds; and discharges on weekends.

Shift work structures of hospital care providers

Hospital care providers indicated that the lack of discharge consultations with patients and family members relates to the structure of hospital physicians' and nurses' work shifts. Patient discharge is often performed by physicians and nurses who do not have an ongoing relationship with the patient or family. Care providers and patients described patients being discharged by care providers who just started their shift or rotation and were not acquainted with the patient's history, needs for community services or preferences. The involvement of multiple personnel sometimes also causes confusion at discharge as patients received contradicting information from different members of the healthcare team.

Accessibility of hospital care providers to patients

Hospital nurses, patients and GPs mentioned difficulties in identifying and contacting the physician or nurse who treated them in the hospital. Patients are often advised to contact their GP, while GPs are not always up-to-date with the treatment that was provided and the follow-up that was advised during the hospitalization.

Pressure on available hospital beds

Factors reported by hospital care providers in pushing for early discharges were financial drivers and the lack of available hospital beds that requires patients to be discharged, even when the patients may not be ready to go home.

Discharges on weekends

A particular problem involved patients discharged just before or during the weekend. Although hospital care providers expressed these discharge situations require specific attention, patients and their GPs experienced problems with receiving immediate home care, equipment and medication during out of office and weekend hours. Moreover, the window of opportunity to arrange the necessary community care is small as discharge planning is decided or conveyed very late during the patient's hospitalization.

DISCUSSION

To our knowledge, this is the first study that investigated patient-centered practice at hospital discharge based on the perceptions and experiences of patients, family members and care providers in the hospital and community. Patients, family members and care providers report various factors that facilitate or present barriers to patient-centered care in the hospital discharge process. Four themes emerged from this study: care provider prioritization of discharge consultations; decision-making within the discharge process; care provider anticipation of patient-specific needs and preferences; and the role of organizational factors.

Our findings indicate that to a considerable extent patient-centered care is influenced by the behaviors of the health professionals and by organizational aspects beyond the direct influence of these professionals (i.e., organizational factors). Our results suggest that both domains are intertwined. In the context of the three maxims of patient-centeredness[16], our findings indicate that in the discharge process the needs of the patient do not often come first. Discharge planning occurs hurriedly just before the patient leaves the hospital, and a standard discharge consultation with the patient appears to be largely lacking. Interviews suggest this occurs due to a lack of time and the prioritization by healthcare providers on providing urgent medical or nursing care to the patient or more likely to other patients.

Second, decisions about the patient are not always made with the patient. Decisions concerning discharge date and follow-up are made by healthcare providers without input of the patient or carers, often due to a lack of time and the pressure on available beds and available resources in the hospital and community. This likely is another important area for improvement, as studies demonstrate that the quality and safety of care and patient satisfaction increases, and healthcare costs decrease, when providers, patients and family members work in partnership[38–41].

Third, many patients are discharged without specific information, instructions and without postdischarge care being tailored to their individual preferences and needs. This is due to an over or lack of estimation of the patient's capabilities, their degree of informal support and emotional needs. As a result, patients leave the hospital uninformed about the details of their posthospital care, and may feel unprepared and anxious. The patient's preparedness for discharge involves more than physical function readiness[42] and should include also emotional, cognitive and psychosocial readiness[43,44], as well as the readiness of family members who will be caregivers. Many of the care providers recognize the importance of these aspects, but are often frustrated by their inability to discharge patients at the optimal moment, due to hospital bed availability for new patients and the limited availability of community care resources. Healthcare providers need to deal with conflicting pressures[45].

Care providers informing patients about discharge repeatedly and in multiple-steps, providing information to patients about the expected discharge date early in the hospitalization, and checking if patients understood the information were perceived as important facilitators to patient-centered care in the discharge process. Finally, patient and healthcare provider experiences demonstrate that it is essential that the GP and community nurses are informed well before the actual discharge date about the patient's hospitalization history, home setting, emotional needs and eventual discharge plan. This will help ensure continuity of care with community care providers able to provide postdischarge care that helps to reduce the likelihood of unnecessary hospital readmissions.

Our study has several limitations. Patient-centered care was analyzed and compared between the five countries that have their own distinct healthcare delivery and funding systems. These systems have unique legislative and organizational characteristics, and perform within different constraints while serving different patient populations. Not all findings were found across all five study sites. For example, we did not find comments on patient involvement in decision-making in the data from Spain. Spanish patients participating in the study were members of ethnic minority groups with low health literacy, which may contribute to differences in the desire for involvement.

Second, the interviews were transcribed in the native languages of the five countries, which may have increased the chances of errors and variations in the interpretation of the data[46]. All efforts were made to ensure the methodological rigor and validity of the translations from English to the native languages as well as back to English across the study sites by using a standardized code book, meeting frequently, sharing and comparing our results, and by performing a pilot analysis. Finally, local influences on the quality of patient-centered care may be underappreciated and our findings may not be generalizable to other healthcare systems.

Future interventions at enhancing patient preparedness for discharge should be directed both at the level of the care provider's attitudes and at their organizational level, with a focus on improving the interactions among care providers, patients and family members, as well as to improving the interactions between hospital and community care providers. One intervention to be tested is a standard discharge handover protocol to offer patients and healthcare professionals a well thought out approach to these handovers. Additional promising interventions consistent with our findings include: educating and training care providers on aspects of patient-centered care[47,48], and a formalized face-to-face discharge consultation, in an interruption-free location, for patients who are about to be discharged. The patients should be assessed for their level of understanding and to repeat or elaborate information[49–51]. Specific tools to facilitate the information exchange to patients and family members might include the use of pictures, video and storyboards[52,53]. Electronic notifications can be used to communicate the patient's medical and psychosocial information, in time, to community care providers[54,55]. These initiatives can improve patient preparedness, reliability of patient care and greatly enhance the value of healthcare[56,57].

Conclusions

This study considerably improves our understanding of barriers and facilitators that can help or compromise patient preparedness for the discharge process. The use of individual and focus group interviews provided valuable insights into attitudinal and external aspects that influence patient-centered care during the discharge process. Overlooking these facilitators and barriers can often undermine the success of clinical interventions that have been used to address handover inefficiencies[58,59]. Patient-centered discharge care processes should address two types of interactions: interactions among the care provider, patient and their family members, and the interactions between the hospital and community care providers. We hypothesize that the quality of these interactions is determined by the extent to which care providers, driven by their attitudes and their organization of care, are willing and able to accommodate patient-specific needs and preferences.

REFERENCES

1. Winefield H, Murrell T, Clifford J, et al. The search for reliable and valid measures of patientcentredness. Psychol Health 1996;11:811-24.
2. Mead N, Bower P. Measuring patient-centeredness: a comparison of three observation-based instruments. Patient Educ Couns 2000;39:71-80.
3. Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. Soc Sci Med 2000;51:1087-110.
4. Stewart M. Towards a global definition of patient centered care. BMJ 2001;233:444-5.
5. Mead N, Bower P. Patient-centered consultations and outcomes in primary care: a review of the literature. Patient Educ Couns 2002;48:51-61.
6. Epstein RM, Franks P, Fiscella K, et al. Measuring patient-centered communication in patient-physician consultations: theoretical and practical issues. Soc Sci Med 2005;61:1516-28.
7. Wolf DM, Lehman L, Quinlin R, et al. Effect of patient-centered care on patient satisfaction and quality of care. J Nurs Care Qual 2008;23:316-21.
8. Epstein RM, Fiscella K, Lesser CS, et al. Why the nation needs a policy push on patient-centered health care. Health Aff 2010;29:1489-95.
9. Institute of Medicine. Crossing the quality chasm: a new health system for the twenty-first century. Washington: National Academies Press, 2001.
10. McCormack B. A conceptual framework for person-centred practice with older people. Int J Nurs Pract 2003;9:202-9.
11. ACSQHC. Patient-centered care: improving quality and safety by focusing care on patients and consumers. Discussion paper. Sydney: Draft for public consultation, 2010.
12. Gerteis M, Edgman-Levitan S, Daley J, et al. Through the patient's eyes: understanding and promoting patient-centered care. San Francisco: Jossey-Bass, 1993.
13. Goodrich J, Cornwell J. Seeing the person in the patient: the point of care review paper. London: The King's Fund, 2008:1-63.
14. Shaller D. Patient centered care: what does it take? USA: Picker Institute and The Commonwealth Fund, 2007.
15. Cronin C. Patient-centered care – an overview of definitions and concepts. Washington, DC: National Health Council, 2004.
16. Berwick DM. What 'patient-centered' should mean: confessions of an extremist. Health Aff 2009;28:w555-65.
17. Arora VM, Prochaska ML, et al. Problems after discharge and understanding of communication with their primary care physicians among hospitalized seniors: a mixed methods study. J Hosp Med 2010;5:385-91.
18. Coleman EA. Falling through the cracks: challenges and opportunities for improving transitional care for persons with continuous complex care needs. J Am Geriatr Soc 2003;51:549-55.
19. Naylor M, Bowles K, Brooten D. Patient problems and advanced practice nurse interventions during transitional care. Public Health Nurs 2000;17:94-102.
20. Coleman EA, Mahoney E, Parry C. Assessing the quality of preparation for post-hospital care from the patient's perspective: the care transitions measure. Med Care 2005;43:246-55.
21. Martens KH. An ethnographic study of the process of medication discharge education (MDE). J Adv Nurs 1998;27:341-8.
22. Parry C, Coleman EA, Smith JD, et al. The care transitions intervention: a patient-centered approach to ensuring effective transfers between sites of geriatric care. Home Health Care Serv Q 2003;22:1-17.
23. Bull MJ, Kane RL. Gaps in discharge planning. J Appl Gerontol 1996;15:486-500.
24. Schoen C, Osborn R, Squires D, et al. New 2011 survey of patients with complex care needs in eleven countries finds that care is often poorly coordinated. Health Aff 2011;30:2437-48.
25. Mistiaen P, Duijnhouwer E, Wijkel D, et al. The problems of elderly people at home one week after discharge from an acute care setting. J Adv Nurs 1997;25:1233-40.
26. Slieper CF, Hyle LR, Rodriguez MA. Difficult discharge: lessons from the oncology setting. Am J Bioeth 2007;7:29-37.
27. Naylor MD. Transitional care of older adults. Annu Rev Nurs Res 2002;20:127-47.
28. Forster AJ, Clark HD, Menard A, et al. Adverse events among medical patients after discharge from hospital. CMAJ 2004;170:345-9.
29. Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161-7.

30. Forster AJ, Murff HJ, Peterson JF, et al. Adverse drug events occurring following hospital discharge. J Gen Intern Med 2005;20:317-23.
31. Mistiaen P. Hospital discharge: problems and interventions (PhD thesis). Utrecht: NIVEL, 2007.
32. The HANDOVER Research Consortium project, FP7-HEALTH-F2–2008-223409, see http://www.handover.eu.
33. Hansagi H, Olsson M, Glas S, et al. Report on the barriers and facilitators to effective handovers in the social, linguistic and technological context in which they take place. Utrecht: Utrecht Medical Center, 2010.
34. Cohen DJ, Crabtree BF. Evaluative criteria for qualitative research in health care: controversies and recommendations. Ann Fam Med 2008;6:331-9.
35. Corbin J, Strauss A. Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. Qual Sociol 1990;13:3-21.
36. Hesselink G, Wollersheim H, Barach P, et al. Report on challenges in patient care and the factors that influence change in practice. Utrecht: Utrecht Medical Center, for the European Union, 2010.
37. Zimmer L. Qualitative meta-synthesis: a question of dialoguing with texts. J Adv Nurs 2006;53:311-18.
38. The Commonwealth Fund. In focus: health care institutions are slowly learning to listen to customers. 2010. http://www.commonwealthfund.org/Content/Newsletters/Quality-Matters/2010/February-March-2010.aspx?view=newsletter_print (accessed 27 Feb 2012).
39. Institute for Patient- and Family-Centered Care. Advancing the practice of patient- and family-centered care: how to get started. Bethesda: Institute for Patient- and Family Centered Care, 2008:1-28.
40. Longtin Y, Sax H, Leape LL, et al. Patient Participation: Current Knowledge and Applicability to Patient Safety. Mayo Clin Proc 2010;85:53-62.
41. Stewart M, Brown J, et al. The impact of patient-centered care on outcomes. J Fam Pract 2000;49:796-804.
42. Anthony MK, Hudson-Barr DC. Successful patient discharge: A comprehensive model of facilitators and barriers. J Nurs Adm 1998;28:48-55.
43. Heine J, Koch S, Goldie P. Patients' experiences of readiness for discharge following a total hip replacement. Aust J Physiother 2004;50:227-33.
44. Miller JM, Piacentine LB, Weiss M. Coping difficulties after hospitalization. Clin Nurs Res 2008;17:278-96.
45. Connolly M, Grimshaw J, Dodd M, et al. Systems and people under pressure: the discharge process in an acute hospital. J Clin Nurs 2009;18:549-58.
46. Larkin PJ, Dierckx de Casterlé B, et al. Multilingual Translation Issues in Qualitative Research: Reflections on a Metaphorical Process. Qual Health Res 2007;17:468-76.
47. Lewin S, Skea Z, Entwistle VA, et al. Interventions for providers to promote a patient-centred approach in clinical consultations. Cochrane Database Syst Rev 2001;(4):CD003267.
48. Clarke CM, Persaud DD. Leading clinical handover improvement: a change strategy to implement best practices in the acute care setting. J Patient Saf 2011;7:11-8.
49. Clark HH, Brennan SE. Grounding in communication. In: Resnick LB, Levine JM, Teasley SD (eds). Perspectives on socially shared cognition. Washington: American Psychological Association, 1991:127-49.
50. Doak C, Doak L, Root J. Teaching patients with low literacy skills. 2nd ed. Philadelphia, PA: JB Lippincott, 1996.
51. Schillinger D, Piette J, Grumbach K, et al. Closing the loop. Physician communication with diabetic patients who have low health literacy. Arch Intern Med 2003;163:83-90.
52. Houts PS, Doak CC, Doak LG, et al. The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence. Patient Educ Couns 2006;61:173-90.
53. Katz MG, Kripalani S, Weiss BD. Use of pictorial aids in medication instructions: a review of the literature. Am J Health Syst Pharm 2006;63:2391-7.
54. Afilalo M, Lang E, Léger R, et al. Impact of a standardized communication system on continuity of care between family physicians and the emergency department. CJEM 2007;9:79-86.
55. Tripp JS. Development and evaluation of notifications to inform primary care providers of summary documentation for their patients' hospital visits. [Dissertation]. Salt Lake City, UT: University of Utah, 2009.
56. Barach P, Berwick D. Patient safety and the reliability of health care systems. Ann Intern Med 2003;138:997-8.
57. Barach P, Moss F. Delivering safe health care. BMJ 2001;323:585-6.
58. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. Lancet 2003;362:1225-30.
59. Shekelle PG, Pronovost PJ, Wachter RM, et al. Advancing the science of patient safety. Ann Intern Med 2011;154:693-6.

Chapter 5

The key actor: a qualitative study of patient participation in the handover process in Europe

Maria Flink
Gijs Hesselink
Loes Pijnenborg
Hub Wollersheim
Myrra Vernooij-Dassen
Ewa Dudzik-Urbaniak
Carola Orrego
Giulio Toccafondi
Lisette Schoonhoven
Petra Gademan
Julie Johnsson
Gunnar Öhlén
Helen Hansagi
Mariann Olsson
Paul Barach

BMJ Quality and Safety 2012;21:i89-i96.

ABSTRACT

Background: Patient safety experts have postulated that increasing patient participation in communications during patient handovers will improve the quality of patient transitions, and that this may reduce hospital readmissions. Choosing strategies that enhance patient safety through improved handovers requires better understanding of patient experiences and preferences for participation.

Objective: The aim of this paper is to explore the patients' experiences and perspectives related to the handovers between their primary care providers and the inpatient hospital.

Methods: A qualitative secondary analysis was performed, based on individual and focus group patient interviews with 90 patients in five European countries.

Results: The analysis revealed three themes: patient positioning in the handover process; prerequisites for patient participation; and patient preferences for the handover process. Patients' participation ranged from being the key actor, to sharing the responsibility with healthcare professional(s), to being passive participants. For active participation patients required both personal and social resources as well as prerequisites such as information and respect. Some patients preferred to be the key actor in charge; others preferred their healthcare professionals to be the key actors in the handover.

Conclusions: Patients' participation is related to the healthcare system, the activity of healthcare professionals' and patients' capacity for participation. Patients prefer a handover process where the responsibility is clear and unambiguous. Healthcare organizations need a clear and well-considered system of responsibility for handover processes, that takes into account the individual patient's need of clarity, and support in relation to his/hers own recourses.

INTRODUCTION

Each transition of care, including the handover between the inpatient hospital and the patient's home and primary care setting is a potential threat to patient safety[1]. Several studies have found that a suboptimal patient handover at hospital admission or discharge may lead to adverse events, with this contributing to suboptimal care, rehospitalization and even death[1–5]. Deficits in handover are often related to inadequate communication between healthcare professionals, with insufficient or unclear information exchanged between the hospital and primary care professionals[3].

Safe and effective transitions of care between care settings require healthcare professionals that give clear, unambiguous and understandable information to patients[6,7]. Some handover communication involves not only the healthcare professionals transitioning the patient from one phase of care to the next, but also the patient. Improvements in hospital to primary care handovers that actively include the patient in the exchange of information between settings and healthcare professionals have been associated with reduced rehospitalization[8,9], and faster delivery of information to primary healthcare professionals[3].

While the knowledge about ways to improve the hospital to primary care handover continuum is increasing, there are few studies that have examined patient participation in handovers. The factors behind patient participation in the larger domain of healthcare decision-making have been studied. Patients differ in their participation in decision-making based on demographics, such as age[10]; health literacy[10,11]; national culture[12]; and expectations for participation[13]. Improved knowledge about how patients experience their participation in handover processes between community and hospital care may help in finding optimal ways of empowering patients that will improve the quality and safety of handovers. This study aims to explore the experiences and perspectives of patients with chronic diseases in regards to their participation in handover communication between primary and secondary healthcare in five European countries.

METHODS

Study design and settings

This study is a secondary analysis of data from a cross-national, qualitative study of patient perspectives on their handovers, conducted at nine hospitals and their feeder primary healthcare systems in the Netherlands, Spain, Poland, Italy and Sweden. The settings were chosen to include different regional healthcare systems and hospitals of different sizes. The study was conducted as part of the European HANDOVER Project that researched handovers between primary and secondary care and examined the perspectives of a wide group of stakeholders in the transition of care between the inpatient hospital and the primary care and community setting (FP7-HEALTH-F2–2008-223409)[14].

Primary study population

Patients in the HANDOVER Project encompassed adults with a chronic disease (diabetes mellitus, chronic obstructive pulmonary disease, heart failure, asthma and/or poly-pharmacy) who were discharged to home directly from an inpatient hospital admission. Additional country-specific inclusion criteria are shown in table 1. The general inclusion criteria were chosen to study patient handovers in both primary and secondary care settings. Patients were expected to have experienced several handovers. The population was chosen because handovers are critical for chronic and high-risk patients who require more frequent and complex transitions[6], and improving handovers for this group was thought to have a sizable impact on their quality of care. The country-specific criteria were used to recruit patients who had experienced handovers in different specialities and clinical settings. Purposive sampling was used to select patients with the chosen diagnoses, ages and gender[15].

Data collection

Individual interviews were conducted with patients in their native language in 2009, and were done in person usually at the patients' home or at the hospital 3 to 4 weeks after discharge, sometimes with a family member present. In all countries, two members of the local research team conducted the interviews. All interviewers had experience with healthcare, either as researchers or as healthcare professionals, and were experienced interviewers or had attended a series of workshops on qualitative interviewing to ensure standardized methods. Focus group interviews were performed in the patients' native language. Focus groups were led by a trained moderator, and had one or two observers who made field notes and added question prompts. All interviews were audio-taped and transcribed verbatim in the local language, according to a jointly decided standardized format.

Both individual and focus groups interviews used a semistructured interview guide, developed in English by the HANDOVER Project researchers and translated into the local language of the research groups[16]. The interview guide covered these areas of interest:

- Experience with recent handovers (appreciative/problematic situations and consequences)
- Perceptions about handovers in general (i.e., experiences, attitudes, methods, tools, barriers, facilitators)
- Perceptions about provider/patient tasks, roles and responsibilities
- Suggestions for improving patient handovers.

The guide was piloted in each country and when necessary, adjusted for local conditions and needs (available upon request). A quality assurance protocol[17] based on BMJ criteria[18] and on criteria presented by Tong et al.[15] was developed (by MVD and JKJ) and used to ensure trustworthiness throughout the data collection and data analyses. Requirements for informed consent and other ethical and legal requirements for research using patient information were fulfilled at all study sites.

Sample for secondary analysis

For the secondary analysis data were extracted from patient interviews in the five countries participating in the HANDOVER Project. The sample consisted of 90 patients, 53 individually interviewed (55% of the overall sample of patients interviewed individually for the original studies conducted as part of the HANDOVER Project) and 37 interviewed in focus groups (100% of the patients interviewed in groups). The distribution across countries is shown in table 1. Where the gender distribution of the primary sample was reported, it included approximately equal numbers of male and female patients.

Table 1. Number of participants by country and inclusion criteria)

Country	Individual interviews (n=53)	Focus group interviews (n=37)	Country specific inclusion criteria	General inclusion criteria
The Netherlands	n=8	n=7	Patients admitted to internal medicine, pulmonary diseases, cardiology or (vascular) surgical wards	≥ 18 years Diagnosed with either diabetes mellitus, chronic obstructive pulmonary disease (COPD), heart failure, asthma or/and poly-pharmacy (≥ 6 drugs) Discharged to home or nursing home (under responsibility of primary/community care)
Spain	n=8	n=3	Patients belonging to cultural minority groups with limited health literacy (capacity to read, write, and understand healthcare information)	
Poland	n=23	n=10	Patients ≥ 60 of age	
Italy	n=5	n=9	Patients admitted to emergency ward	
Sweden	n=9	n=8	Patients admitted to emergency ward via emergency room. If living at a nursing home, only within a geographically specified area	

Data analysis

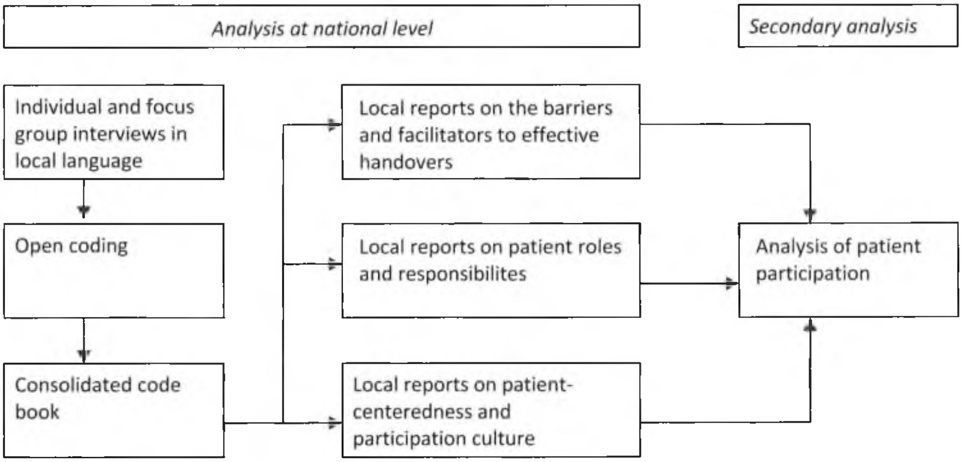
The analysis consisted of two main parts: analysis of interviews at the national level, and a secondary analysis[19] of the cross-national data (see figure 1).

Analysis at national level

Two interviews from each country were translated into English, and coded inductively using a modified grounded theory approach of Corbin and Strauss[20]. A qualitative data analysis software (Atlas.ti) was used to facilitate storing, coding and indexing of the data[21]. The researchers created a codebook based on codes generated in each country. The codebook consisted of the code and an operational definition, both of which were agreed upon during regularly scheduled conference calls and face to face meetings, and was used for analysis of both individual and focus group interviews. Two researchers in each country analyzed their country's data in parallel with the data collection, and continued to collect data until conceptual saturation was reached and no new codes or categories were generated[20]. Local reports were written in English by one or two of the researchers in each country and used for compiled analyses for the European HANDOVER

Project studies. These studies focused on barriers and facilitators to effective handovers; patient roles and responsibilities; and patient-centeredness and participation culture[16,22,23].

Figure 1. Procedure – from data collection to the current secondary analysis



Secondary analysis

The local reports, including quotes from the individual interviews and focus groups, were used for the secondary analysis, which focused on patients' perspective on their own participation in handovers. Thus, this secondary analysis seeks to answer a new research question[19], using data that was already collected.

Local reports were analyzed using a qualitative inductive content analysis as described by Hsieh and Shannon[24]. Two authors (MF, MO) coded the texts in open coding and three authors (MF, MO, GH) sorted the codes into categories and themes. Validity checking involved all authors of the local reports, who reviewed the findings to ensure they were consistent with the original interview data.

RESULTS

The data analysis resulted in eight categories, from which three themes were developed: (I) patient positioning in the handover process; (II) prerequisites for patient participation; and (III) patient preferences for the handover process (see table 2).

Patient positioning in the handover process

Three types of patient experiences form the categories under this theme: patients as the key actors in the handover process; patients sharing the responsibility for the handover with healthcare professionals; and healthcare professionals functioning as the key actors in the handover process.

Table 2. Categories and themes

Categories	Themes
1. Patients as key actors in the handover process	A. Patient positioning in the handover process
2. Patients sharing the responsibility for the handover with healthcare professionals	
3. Healthcare professionals functioning as the key actors in the handover process	
4. Actions required for patients to be key actors	B. Prerequisites for patient participation
5. Resources and discipline required to be the key actor	
6. Facilitators for and barriers to patient participation	
7. Patient preferences for being the key actors	C. Patient preferences for the handover process
8. Patient preferences regarding healthcare professionals serving as the key actors	

Patients as the key actors in the handover process

Patients assumed the responsibility for the handover communication, including establishing contact with the next care unit as well as the responsibility for collecting, storing and handing over essential information for managing their care, such as medication lists or discharge notes. For example, when a healthcare professional in the hospital setting in Italy wrote the discharge note to transition the patient to the primary care setting–this discharge note was given to the patient for delivery to the general practitioner. The key actor positioning was most explicitly stated by the geriatric patients in Poland, who noted they needed to take responsibility in organizing the handovers as well as being couriers.

Patients who functioned as key actors perceived their active involvement was required for an effective handover and to ensure continuity of care. These patients had either learned from past experiences that little or no information was transferred unless they did it themselves, or perceived that healthcare professionals expected them to assume the initiative and be active during their handovers.

> *Patient, Poland: "Well, we all know by now that it [general practitioner – hospital communication] doesn't exist. You want a referral–then you get it. Then I arrange my admission–neither my general practitioner nor hospital physician care ...".*

Being the key actor could cause some patients to blame themselves for not fulfilling the task of facilitating the handover when information was lacking between care settings.

> *Patient, Italy: "It was our fault. We forgot to contact the general practitioner during the hospitalization".*

Patients sharing the responsibility for the handover with healthcare professionals

Examples of patients sharing responsibility for the handover with healthcare professionals were found in Sweden for patients who were admitted for acute conditions. These patients participated in sharing essential or specific information for their care transition, which complemented the handover communication conducted by the healthcare professional. For example, during hospital admissions the patients informed healthcare professionals about their medications and previous care episodes, and at discharge, they informed the healthcare professionals about the name or address of their general practitioner to ensure that the correct primary care professional received the handover information. Healthcare professionals actively encouraged patients to share the responsibility for communication, such as ensuring that proper information was shared between the hospital and community care settings and asked of the patients to assume responsibility for their own health.

> *Patient, Sweden: "They used to say, please call the advanced home care services, just for safety reasons, and tell them you're back home".*

Healthcare professionals functioning as the key actors in the handover process

Some patients viewed the healthcare professionals as the key actors in the handover process. These patients assumed that handovers are performed by healthcare professionals, focusing on verbal and/or written communication, electronic mail or medical records data shared between the care settings. This more passive positioning in the handover was found among the Dutch patients. Some hospitals in the Netherlands had a dedicated 'transfer nurse' to manage handovers to the primary care setting after discharge.

> *Patient, Netherlands: "Yes, I indeed think that if the hospital takes responsibility to discharge patients because they think they can manage outside the hospital, they also have to take that responsibility and arrange an alternative solution if it's not possible".*

Prerequisites for patient participation

This theme had three categories: actions required for patients to be key actors; resources and discipline required to be the key actor; and facilitators for and barriers to patient participation.

Actions required for patients to be key actors

To be able to function as key actors, patients had to assume the responsibility, that is, take initiatives and ask the healthcare professionals questions to get the needed information.

> *Patient, Spain: "In order to have more information, it is important to ask ... and sometimes, you ask a question, and they answer "Well, I don't know...Wait please, I will ask somebody" ... and they don't tell you anything".*

In addition, patients had to be explicit and sometimes be assertive in their communication with the healthcare professionals to help the handover move forward.

Resources and discipline required to be the key actor

Patients acknowledged the importance and the potential of having own resources, and noted they investigated their social network to find the best healthcare professional available. Patients also used their available family and contact resources. Family members sometimes replaced the patient in taking responsibility for conveying handover information and acting as medical secretaries or information conduits.

Patients with limited personal resources or with low health literacy had difficulties understanding the received information and sharing the information with the healthcare professionals. This limited their participation in the handover communication.

> *Patient, Spain: "What can I say? The main thing was that I could not speak in Spanish so I can't express many things, so that is the problem".*

In order to function as the key actors in the handover, geriatric patients in Poland had to be disciplined in organizing and transferring medical documents as they were the main repository of patient documentation. In this model, lack of discipline and willingness to systematically collect relevant documents were barriers to effective handovers.

> *Patient, Poland: "If the patient does not want and would not comply, the best doctor would not (be able to) help him".*

Facilitators for and barriers to patient participation

Patients reported on several communication facilitators and barriers related to their participation. Patients perceived a positive climate for communication, based on mutual respect, in an open atmosphere and on a personal level, between them and the healthcare professionals as an enabling factor for participation in the handover. Accordingly, a negative climate for communication involved healthcare professionals neglecting patients' individual needs, or being too busy to communicate with patients.

Lack of information was the main barrier to participation during the handover process. Patients perceived a gap between the information they received and the information they actually needed for continuous care. Information gaps often concerned medication information; when patients were discharged with unclear or insufficient information on how best to handle their medications or without a new and updated medication list they could not participate actively in follow-up. Finally, the patients expressed the need for a dedicated discharge encounter in which they would be given all the information needed that could help them improve their postdischarge care.

> *Patient, Italy: "I go back home with a bag of drugs and trust me that this was a mess I could not sort out ... They didn't tell us that there could be a risk of depression. I had a medical discharge report, they have been really good for God's sake, but they did not explain to us enough".*

Patient preferences for the handover process

There are two categories under this theme: patient preferences for being the key actors; and patient preferences regarding healthcare professionals serving as the key actors.

Patient preferences for being the key actors

The preference for being key actors in the handover process was expressed by Swedish patients undergoing acute admissions, by geriatric patients in Poland, and by patients in the Netherlands. These patients stressed the importance of patients in contributing to an effective handover. For example, Swedish patients noted that when they assumed responsibility for the handover, communication worked better. It also empowered them and gave them a sense of control over the handover process. Patients also found the opportunity to look up and ascertain the accuracy of the handover information an advantage.

> *Focus group, the Netherlands*
> *"Patient A: You receive the letter and you deliver it to the doctor, and then the general practitioner will visit to see how you are doing, so, this is very satisfying for me, yes.*
> *Interviewer: So you are satisfied with this, that the information is routed via you?*
> *Patient B: I find it an advantage when it is routed via the patient.*
> *Patient A: Yes, and it's also true that you are certain the information is coming across".*

Patient preferences regarding healthcare professionals serving as the key actors

Patients who indicated a preference for healthcare professionals to be the key actors in the handover perceived handovers more effective when healthcare professionals were actively involved. These patients felt that professionals should be fully responsible for the handover. They also reported feelings of frustration when they were urged to take responsibility for the handover and wanted a passive role in their care. Some patients mentioned a transfer nurse as the preferred key actor for handovers.

> *Relative, Sweden: "They should have somebody who always gets in touch with the nursing home. Someone responsible, that can take care of all contacts".*

One subgroup, patients with low health literacy, did not express any preferences regarding participating or not participating in the handover process.

DISCUSSION

Three themes of importance for patient participation were revealed in the study: patient positioning in the handover process, prerequisites for patient participation and patient preferences for the handover processes. This study does not make comparisons across countries. Instead the aim was to study patient participation in handover processes with different characteristics, in various care settings to explore patients' perspectives more indepth. The findings demonstrate that patients' positioning ranged from being the key actor, sharing the responsibility with healthcare professionals to being passive.

Patients' positioning seems to respond to the handover system in an elastic relation and are modulated by their perceptions of the healthcare professionals actions. In systems with less active engagement of healthcare professionals, patients assumed a more active position, while in systems with active engagement, particularly by dedicated professionals like transfer nurses, patients assumed a more passive position. Other studies have found that patient participation differs depending on the settings, patient and physician attributes[10,25,26], and the experiences of patient participation in the handover processes mirror these findings. Due to the fact that our study was a secondary analysis of the data, we cannot be sure to which degree the positioning continuum was a result of the patient characteristic or reflects the characteristics of the participating nations' healthcare systems.

The passive role of some patients in the handover may be a consequence of these individuals lacking information or instructions from healthcare professionals that would allow them to actively participate, or a lack of personal resources, capabilities or discipline. To be able to participate actively, patients required certain resources and prerequisites (e.g., a social network, health literacy and clear information/instructions), as well as being treated with respect. Two recent reviews on patient participation found positive outcomes of patient participation include better interaction between patients and healthcare professionals, and enhanced patient safety[10,27]. The findings of this study thus raise the question whether the quality of handovers is reduced when patients are passive participants, because they may lack the prerequisites for active participation.

Many patients did not state a preference for shared responsibility, as one might have expected, but preferred that either the healthcare professionals or the patient functioned as the key actor. We have not found any earlier studies on patient preferences regarding assuming handover responsibility. Comparing our findings to studies on patient participation in decision-making[11,28] reveals that patients choose to be passive participants when their involvement may have a negative affect on the outcome of the decision, when decisions are complex, and, when patients were severely ill[10,11]. Patients with cancer preferred a shared or an active role[28]. Patients' preference for healthcare professionals to be the key actors in our study may be explained by their chronic disease status, and the requirement for sharing complex medical information, as well as in the patients' statements that a handover process with clear responsibility was most effective. Because patients in the primary interviews were not explicitly asked about their interest in shared responsibility, we cannot exclude that some patients' desire shared responsibility. However, our findings suggest that patients in our analysis appeared to prefer clarity about who is responsible for the handover, irrespective of whether the patient or the health professionals function as the key actor.

The study has several limitations. First, the initial translations of the interviews were conducted in the respective countries by the researchers themselves, and not by professional translators, and the secondary analysis was performed on the English text by Swedish and Dutch researchers, raising concerns about the potential for linguistic misinterpretation. This risk was reduced by having both the primary researchers and the individuals who conducted the secondary analysis actively involved in discussions about the study aim and methods, by having all steps in data collection and analysis monitored using a quality assurance programme[17], and by ensuring that the authors of the local reports have read and confirmed the accuracy of data from the secondary analysis. Also, the secondary analysis was not performed directly on the original data but on data already selected for local reports by researchers and it was not possible to conduct a validity check with the original patients interviewed. Third, patient-specific information on age and the distribution of the chronic conditions is not known for the sample for secondary analysis. The primary study population in the HANDOVER-study included a representative distribution by age, gender and diagnoses[16,22,23]. Finally, the population was restricted to adult patients with chronic conditions, which may limit the ability to transfer the findings across all handovers. The methodological limitations with secondary analysis have been well described by Thorne[19]. A key issue lies in the distance between the original data source –the patients– and the secondary question about patient participation. This question was however a natural extension from the primary research questions of the HANDOVER-study.

Conclusions

This study, despite its limitations, increases our knowledge of the preferences of patients for participating in the handover between the inpatient and the primary care setting. Patient participation in handovers between primary and hospital care is related to the healthcare system, the activity of healthcare professionals and the patients themselves. The ability to participate and take an active positioning requires patients' personal and social resources, prerequisites such as personal and clear information and respectful treatment by healthcare professionals. Patients prefer a handover process where the responsibility for the handover communication is clear and unambiguous, that is, a system that ensures them in transparent manner there is continuity of their care. This is an important finding for efforts to improve patient handovers to create and sustain greater reliability, transparency and consistency.

Future improvements of the patient handover will require the healthcare organizations to develop a clear and well-considered system of assigning responsibility for this process. Regardless of the system chosen, the individual patient's need of clarity and a level of support that is tailored to his/her own resources and ability to participate in the handover must be taken into account. Future development and research is needed to find out how a shared responsibility could look like in practice and be unambiguous for the patients. Such knowledge can help enhance safe patient transitions between the hospital and the patient's home.

REFERENCES

1. Forster AJ, Clark HD, Menard A, et al. Adverse events among medical patients after discharge from hospital. Can Med Assoc J 2004;170:345-9.
2. Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161-7.
3. Kripalani S, LeFevre F, Phillips CO, et al. Deficits in communication and information transfer between hospital-based and primary care physicians – Implications for patient safety and continuity of care. JAMA 2007;297:831-41.
4. Moore C, Wisnivesky J, Williams S, et al. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. J Gen Intern Med 2003;18:646-51.
5. Tam VC, Knowles SR, Cornish PL, et al. Frequency, type and clinical importance of medication history errors at admission to hospital: a systematic review. Can Med Assoc J 2005;173:510-15.
6. Halasyamani L, Kripalani S, Coleman E, et al. Transition of care for hospitalized elderly patients–Development of a discharge checklist for hospitalists. J Hosp Med 2006;1:354-60.
7. Johnson A, Sandford J. Written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home: systematic review. Health Educ Res 2005;20:423-9.
8. Coleman EA, Parry C, Chalmers S, et al. The care transitions intervention – Results of a randomized controlled trial. Arch Intern Med 2006;166:1822–8.
9. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization. A randomized trial. Ann Intern Med 2009;150:178-88.
10. Davis RE, Jacklin R, Sevdalis N, et al. Patient involvement in patient safety: what factors influence patient participation and engagement? Health Expect 2007;10:259-67.
11. Say R, Murtagh M, Thomson R. Patients' preference for involvement in medical decision making: A narrative review. Patient Educ Couns 2006;60:102-14.
12. Meeuwesen L, van den Brink-Muinen A, Hofstede G. Can dimensions of national culture predict cross-national differences in medical communication? Patient Educ Couns 2009;75:58-66.
13. Coulter A, Jenkinson C. European patients' views on the responsiveness of health systems and healthcare providers. Eur J Public Health 2005;15:355-60.
14. Improving the continuity of patient care through identification and implementation of novel patient handover processes in Europe. http://www.handover.eu (accessed 21 Oct 2011).
15. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care 2007;19:349-57.
16. Hansagi H, Olsson M, Glas S, et al. Report on the barriers and facilitators to effective handovers in the social, linguistic and technological context in which they take place. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2010.
17. Johnson JK, Barach P, Vernooij-Dassen M. Conducting a multicentre and multinational qualitative study on patient transitions. BMJ Qual Saf 2012;21(Suppl 1):i22-8.
18. Mays N, Pope C. Qualitative research in health care. Assessing quality in qualitative research. BMJ 2000;320:50-2.
19. Thorne S. Ethical and representational issues in qualitative secondary analysis. Qual Health Res 1998;8:547-55.
20. Corbin J, Strauss A. Grounded theory research: Procedures, canons, and evaluative criteria. Qual Sociol 1990;13:3-21.
21. ATLAS.ti Scientific Software Development Company, GmbH, Berlin, Germany. http://www.atlasti.com/ (accessed 21 Mar 2011).
22. Barach P, Gademan P, Kalkman C, et al. Report on how variations in handover processes lead to near misses and adverse outcomes, and identifying standardized elements of communication. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2010.
23. Hesselink G, Wollersheim H, Barach P, et al. Report on challenges in patient care and the factors that influence change in practice. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2010.
24. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res 2005;15:1277-88.
25. Street RL Jr, Krupat E, Bell RA, et al. Beliefs about control in the physician-patient relationship: effect on communication in medical encounters. J Gen Intern Med 2003;18:609-16.

26. Street RL Jr, Gordon HS, Ward MM, et al. Patient participation in medical encounters: why some patients are more involved than others. Med Care 2005;43:960-9.
27. Longtin Y, Sax H, Leape LL, et al. Patient participation: current knowledge and applicability to patient safety. Mayo Clin Proc 2010;85:53-62.
28. Tariman JD, Berry DL, Cochrane B, et al. Preferred and actual participation roles during health care decision making in persons with cancer: a systematic review. Ann Oncol 2010;21:1145-51.

Chapter 6

Improving patient handovers from hospital to primary care
A Systematic Review

Gijs Hesselink
Lisette Schoonhoven
Paul Barach
Anouk Spijker
Petra Gademan
Cor Kalkman
Janine Liefers
Myrra Vernooij-Dassen
Hub Wollersheim

Annals of Internal Medicine 2012;157:417-428.

ABSTRACT

Background: Evidence shows that suboptimum handovers at hospital discharge lead to increased rehospitalizations and decreased quality of health care.

Purpose: To systematically review interventions that aim to improve patient discharge from hospital to primary care.

Datas sources: PubMed, CINAHL, PsycInfo, the Cochrane Library, and EMBASE were searched for studies published between January 1990 and March 2011.

Study selection: Randomized, controlled trials of interventions that aimed to improve handovers between hospital and primary care providers at hospital discharge.

Data extraction: Two reviewers independently abstracted data on study objectives, setting and design, intervention characteristics, and outcomes. Studies were categorized according to methodological quality, sample size, intervention characteristics, outcome, statistical significance, and direction of effects.

Data synthesis: Of the 36 included studies, 25 (69.4%) had statistically significant effects in favor of the intervention group and 34 (94.4%) described multicomponent interventions. Effective interventions included medication reconciliation; electronic tools to facilitate quick, clear, and structured summary generation; discharge planning; shared involvement in follow-up by hospital and community care providers; use of electronic discharge notifications; and Web-based access to discharge information for general practitioners. Statistically significant effects were mostly found in reducing hospital use (e.g., rehospitalizations), improvement of continuity of care (e.g., accurate discharge information), and improvement of patient status after discharge (e.g., satisfaction).

Limitations: Heterogeneity of the interventions and study characteristics made meta-analysis impossible. Most studies had diffuse aims and poor descriptions of the specific intervention components.

Conclusion: Many interventions have positive effects on patient care. However, given the complexity of interventions and outcome measures, the literature does not permit firm conclusions about which interventions have these effects.

INTRODUCTION

When a patient's transition from the hospital to home is suboptimal, the repercussions can be far-reaching – rehospitalization, adverse medical events, and even death[1]. Several studies over the past decade have identified deficits in communication and information transfer between hospital and primary care providers[2–6]. Ineffective handovers at hospital discharge seriously impede the quality and safety of patient care. Forster and colleagues[7] demonstrated that 1 in 5 patients has an adverse event after being discharged. Approximately 62% of these adverse events, which ranged from serious laboratory abnormalities to permanent disabilities, could have been prevented or alleviated[7]. Inadequate handovers at hospital discharge also lead to unanticipated rehospitalizations[5,8] and overwhelm emergency departments with unplanned visits[9].

The need for effective patient discharge from the hospital is increasing because of the rising number of transitions of elderly and chronically ill patients between various health care institutions, the trend toward shorter hospital stays, and the growing effort to deliver care in the community[10–13]. Despite the increasing awareness of the need to improve handovers from hospital to primary care providers[1,6], a comprehensive evaluation of the effectiveness of interventions is lacking. A review by Kripalani and colleagues[6] focused on the prevalence of deficits in communication and information transfer between hospital and primary care physicians and the effectiveness of interventions. However, the review included only 3 randomized controlled trials (RCTs).

Hansen and colleagues[14] recently reviewed the effect of interventions on 1 specific outcome (the reduction of rehospitalizations within 30 days) and showed that no intervention was regularly associated with reduced rehospitalizations if implemented alone. Other reviews mainly examined the effect of 1 specific type of intervention at hospital discharge[15,16] or interventions that sought to improve handovers in the hospital[17,18], in specific patient groups[19], at referral[20], and among care providers and patients and their relatives[15,21,22]. The aim of this study is to systematically review interventions that were tested in RCTs and that aimed to improve patient handovers from hospital to primary care and to evaluate the overall effects of these interventions.

METHODS

Data sources

We searched for English-language studies published between 1990 and 1 March 2011 using the following full-text databases: PubMed (including MEDLINE), CINAHL, PsycInfo, the Cochrane Library, and EMBASE. Appendix 1 provides a detailed listing of search terms. The references of the selected studies were manually checked to identify additional relevant studies that were missed in the database search.

Study selection

Two reviewers independently assessed inclusion eligibility of the retrieved studies using the search strategy. The initial selection for inclusion was based on the title and abstract of the study. When the title and abstract provided insufficient information to determine the relevance, a full-text copy of the article was retrieved and reviewed. For the final selection, a full-text copy of the study was examined to determine whether it fulfilled the inclusion criteria. Disagreement about inclusion was solved by discussion. When no consensus could be achieved, a third reviewer made the final decision. Each study had to meet 4 criteria to be included in this review. First, it had to be an RCT that was published between January 1990 and 1 March 2011 as a full-text article or dissertation with an English-language title and abstract. Second, it had to examine patients and care providers involved in the transition of care from hospital to primary care or home care. Studies that involved patients with a psychiatric diagnosis, patients younger than 18 years, and pregnant women were excluded. Third, it had to have an intervention explicitly describing 1 or more components that aimed to improve the handover of care between hospital and primary care providers during hospital discharge (before, during, or after physical transition of the patient) within country borders. Fourth, it had to have at least 1 outcome measure addressing the quality or safety of the handover process or outcomes of handovers within the first 3 months after discharge from the hospital. Studies that examined only health care service expenditures and costs were excluded.

Quality assessment of methods

After study search and selection criteria were discussed and agreed on, 2 reviewers independently assessed the methodological quality of the full-text studies and discussed the results for consensus. The Cochrane Group's predesigned table[23] was used and modified to ensure standardized scoring. Methodological quality was assessed on the basis of selection bias (method of randomization, allocation concealment, and inclusion and exclusion criteria specified and similarity of groups at baseline), performance bias (assessors blinded to outcome), attrition bias (studies that described characteristics of participants lost to follow-up or were intention-to-treat analyses), and detection bias (power calculation and valid outcome measures). The blinding of participants in the studies was not included as a quality criterion because it is impossible to adequately blind participants in the complex social interventions included in this review. The decision about whether the criteria were fulfilled was resolved by discussion. Studies scored 1 point for each fulfilled criterion. If assessment was impossible, the quality element under consideration was labeled "not possible". If information was inadequate or unknown, the decision was labeled "unknown". Studies were excluded if they scored 3 points or fewer.

Data extraction

Each article that met study eligibility criteria was independently abstracted by 2 reviewers using a standardized form modified from a checklist developed by Grimshaw and colleagues[24]. The data extracted from the studies comprised a description of objectives, design, participants, intervention, and effect measures. Any disagreement was resolved by discussion among the reviewers, and a final decision was made by the third reviewer.

Data synthesis and analysis

We organized study outcomes in tabular form and made a qualitative assessment based on the methodological quality, sample size, intervention characteristics, outcome, statistical significance, and direction of effects observed. The interventions were classified on the basis of the components of the intervention that aimed to improve discharge handover. The classification was adapted from the definition of continuity of care by Hellesø and colleagues[3], consisting of the following elements that determine quality and safety of handovers between hospital and primary care providers: information (the quality of information that is exchanged between hospital and primary care providers in terms of completeness, accuracy, and clarity), coordination of care (the quality of assessment, planning, and organization of follow-up services and needs), and communication (the quality of exchanging information in terms of personal and direct contact, accessibility, and timeliness).

Role of the funding source

The Framework Programme of the European Commission, European Union, provided funding for the study. The funding source did not participate in study conception, data collection, analyses, manuscript preparation, the decision to submit the manuscript for publication, or any other part of the study.

RESULTS

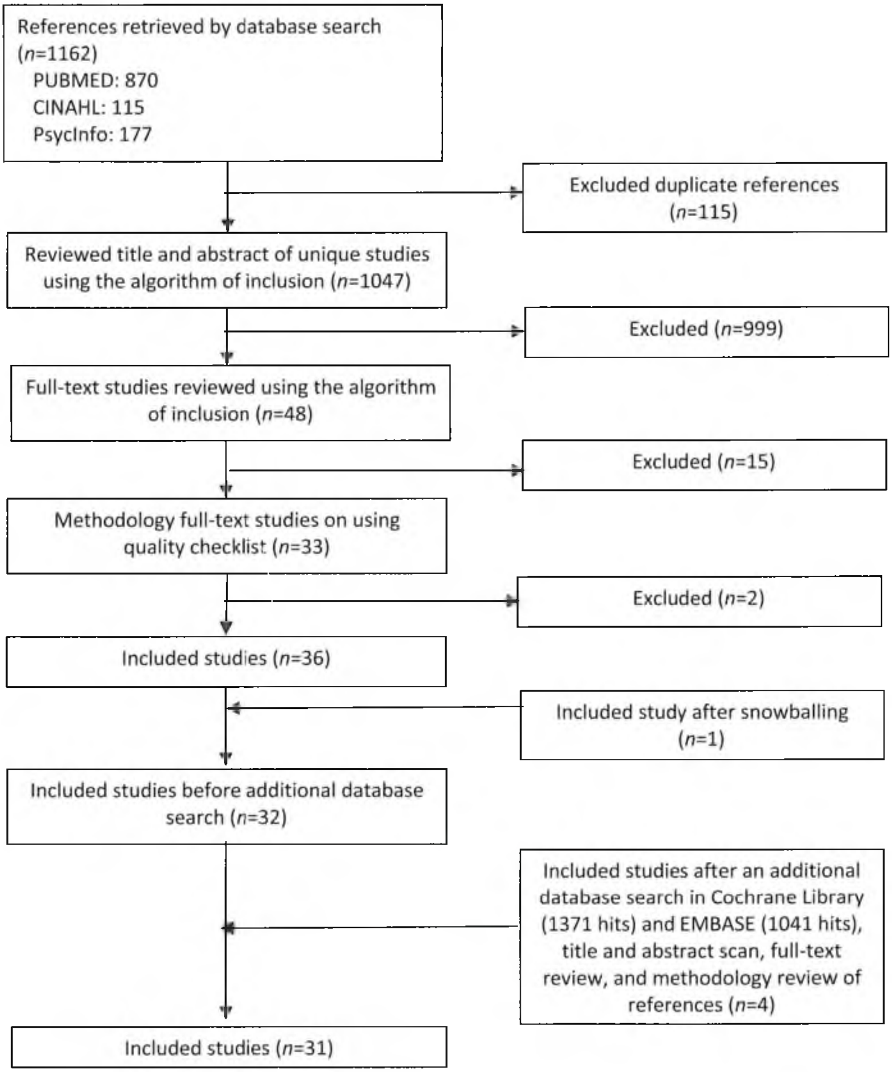
Search results

Our initial search identified 1162 citations (figure 1), of which 870 were in PubMed, 115 were in CINAHL, and 177 were in PsycInfo. The title and abstract scan resulted in 48 papers that, at first glance, met the inclusion criteria or raised doubt. Fifteen papers were excluded after full-text scan, and 2 more were excluded on the basis of poor methodological quality scores of 3 or less[25,26]. One additional paper was identified by manual review of the reference lists of the original 48 papers. A search in the Cochrane Library and EMBASE resulted in 4 more papers that met our inclusion criteria and quality assessment criteria. Thus, the final set consisted of 36 published studies that underwent full-text abstraction. Because of heterogeneity of the study designs, participants, and outcome measures, meta-analysis was not possible.

Methodological quality

Overall methodological quality of the studies (Appendix 2) was relatively high: Scores ranged from 2 to 9 (mean fulfilled criteria [±SE], 6.8±1.7). Application of the quality assessment criteria also demonstrated several limitations. In 12 of the 36 included studies (33.3%), assessors were not blinded to outcome, and in 10 of the studies (27.8%), blinding status was unclear. In 10 studies (27.8%), the intervention and control groups were not similar at baseline. Ten studies (27.8%) did not report the characteristics of participants lost to follow-up. Nearly half of the studies (44.4%; 16 studies) involved an intervention group of fewer than 100 participants.

Figure 1. Summary of evidence search and selection



Characteristics of included studies

Appendix 3 summarizes the characteristics of the included studies, stratified by outcome. The main population of the studies consisted of elderly patients (in 18 studies) with various diagnoses (general medical, surgical, heart failure, geriatric, stroke, and breast cancer). Patients were discharged from acute, general medical, cardiac, surgical, and long-stay service from various types of hospitals (urban care, secondary care, tertiary care, teaching, and university-affiliated). The sample size ranged from 20 to 1098 participants for the intervention groups and from 14 to 1107 participants for the control groups.

The studies reported various outcomes (tables 1 and 2). Most studies reported 1 or more outcomes related to hospital use[27,31,34,35,38,39,41,44–50,53,54,56,59,61,62], continuity of care[27,28,30,32,34,36,38–40,43–46,48,51,56–58,60], and patient status[29,31,32,34,39,41,42,44,45,50–58,61]. Other studies reported 1 or more outcomes related to errors, near-misses, and adverse events[29,30,33,36,37,44,46,48]; use of primary care [34,43,47,56]; health care provider status[36,57]; and caregiver status[51,52].

Table 1. Classification of outcome measures used in included studies

Outcome	Examples of specific outcome measures used in studies
Hospital use	Postdischarge rehospitalizations
	Unplanned rehospitalizations
	Hospitalizations
	ED visits
	Length of hospital stay
Continuity of care*	GP knowledge of patient's hospital experiences
	Completeness of discharge summary
	Timeliness of discharge summary receipt by GP
	Medication reconciliation
	Better patient management by GPs
Patient status	Quality of life
	Satisfaction
	Perception of discharge preparedness
	Self-perceived medication understanding
	Medication adherence
	Functional ability
	Death
Errors/near-misses/adverse events†	Mismatch in drug name, dose, or frequency prescribed in discharge letter and by GP
	Medication discrepancies (between hospital and community pharmacy records)
	Preventable adverse outcomes/events
	Medication prescription error
	Any medication discrepancy
Primary care use	Follow-up visits by GP
	More actions initiated by GP on receipt of information
Health care provider status	GP confidence in management of patients' future problems
	Hospital staff satisfaction with method of summary generation
Caregiver status	Caregiver strain related to care provision

ED=emergency department; GP=general practitioner.

* Adapted from the definition of continuity of care by Hellesø et al.[3] (outcomes that relate to the quality of information, communication, and coordination of care).

† Unintended occurrences in handover of care potentially causing harm to the patient (prospectively and retrospectively registered).

Table 2. Types of Outcomes and Statistical Significance of Effects, by Studied Interventions

Intervention (reference)	Outcome						
	Hospital use	Continuity of care*	Patient status	Errors/near-misses/ adverse events†	Primary care use	Health care provider status	Caregiver status
Geriatric floating interdisciplinary transition team[27]	✔	✔					
Delivery of electronic discharge summary by e-mail[28]		✔‡					
Clinical pharmacist discharge service[29]			✔	✔			
Comprehensive discharge follow-up[30]		✔‡		✔‡			
Interdisciplinary intervention program[31]	✔		✔‡				
Software-assisted hospital discharge: computerized physician order entry[32]		✔‡	✔‡				
Software-assisted hospital discharge: computerized physician order entry [33]				✔			
Reengineered hospital discharge program[34]	✔‡	✔‡	✔‡		✔‡		
Supplemental care bundle[35]	✔‡						
Electronic discharge summary program[36]		✔		✔		✔	
Computerized medication reconciliation tool and process redesign[37]				✔			
Notification to inform GPs of discharge summary documentation[38]	✔	✔‡					
Nurse-driven, evidence-based discharge planning protocol[39]	✔‡	✔‡	✔‡				
Enhanced medication discharge plan[40]		✔					
Stroke discharge care case management[41]	✔		✔				
Community liaison pharmacy service[42]			✔‡				
Standardized Web-based communication system between GPs and ED[43]		✔‡			✔‡		
Enhanced pharmacist counseling and follow-up[44]	✔‡	✔	✔	✔‡			
Hospital-coordinated discharge care plan[45]	✔	✔‡	✔‡				
Hospital-based community liaison pharmacy service[46]	✔	✔‡		✔‡			
Comprehensive Geriatric Assessment and multidisciplinary intervention[47]	✔‡				✔		
Pharmacist transition coordinator[48]	✔‡	✔‡		✔			
Intensive community nurse-supported discharge program[49]	✔						
APN-directed discharge planning and home follow-up protocol[50]	✔‡		✔‡				
Nurse-led early discharge[51]		✔‡	✔				✔
Case management and post-acute care program[52]			✔‡				✔
Comprehensive follow-up home visits[53]	✔		✔‡				
Hospital-to-home transitional care model[54]	✔‡		✔‡				
Extended stroke service unit with early supported discharge[55]			✔				
Pharmacy discharge plan[56]	✔	✔	✔		✔		

Intervention (reference)	Outcome						
	Hospital use	Continuity of care*	Patient status	Errors/near-misses/ adverse events†	Primary care use	Health care provider status	Caregiver status
Personal invitation to GPs to visit or contact hospital and a special discharge summary[57]		✓‡	✓			✓	
GP input into discharge planning[58]		✓‡	✓‡				
APN-centered comprehensive discharge planning and home follow-up protocol[59]	✓‡						
Database-generated discharge summaries[60]		✓‡					
Postdischarge geriatric assessment[61]	✓		✓				
Comprehensive multidisciplinary treatment strategy[62]	✓‡						
Total	**20**	**19**	**19**	**8**	**4**	**2**	**2**

APN=advanced practice nurse; ED=emergency department; GP=general practitioner.

* Adapted from the definition of continuity of care by Hellesø and colleagues (3) (outcomes that relate to the quality of information, communication, and coordination of care).

† Unintended occurrences in handover of care potentially causing harm to the patient (prospectively and retrospectively registered).

‡ Outcome with statistically significant effect in favor of the intervention group.

Intervention characteristics of included studies

All but 2 studies[28,38] had multicomponent interventions that used a comprehensive program, model, protocol, information and communication technology, or a liaison with a range of specific activities and tools. Table 3 provides a more descriptive overview of the intervention characteristics. Furthermore, 26 studies consisted of interventions performed by designated care providers (e.g., case managers, liaisons, or multidisciplinary teams) using aspects of case management. The interventions were applied only during hospitalization (2 studies), at discharge (5 studies), after discharge (6 studies), or a combination of 2 stages (14 studies) or all 3 stages (7 studies). For 2 studies, this was unclear[36,43].

Specific components of effective interventions

Statistically significant effects in favor of the intervention group in 1 or more outcomes were found in 25 of the 36 studies reviewed (table 2 and appendix 3). Further details about the effects of the interventions are given in appendix 3.

Information shared between providers

Fourteen of the 22 studies examining an intervention with a focus on improving the quality of the information exchanged at discharge showed a statistically significant improvement in continuity of care[32,34,39,43,45,46,48,57,60]; hospital use[34,35,39,44,48,50,62]; patient status[32,34,39,42,45,50,62]; errors, near misses, or adverse events[44,46]; and primary care use[34]. In these 14 studies, the activities related to improving the quality of the information exchanged involved medication reconciliation by a hospital pharmacist, study pharmacist, liaison pharmacist, or community pharmacist [34,35,42,44,46,48]; medical information reconciliation without a pharmacist[32,39,45,50,62]; electronic templates as the primary method of information sharing[44,45]; database-generated discharge summaries comprising structured formats to organize information[60]; clinical decision support, alerts for pending results, and online reference information[32]; and such other tools as pick lists for standard drug doses and required fields to facilitate quick, clear, and structured data entry[32].

Coordination of care

Twenty of the 27 studies examining an intervention with a focus on improving coordination of care showed a statistically significant improvement in continuity of care[30,32,34,39,43,45,48,51,57,58], hospital use[33,35,39,47,48,50,54,59,62], patient status[31,32,34,39,42,45,50,52–54,58,62], and primary care use[34]. These studies described such intervention activities as organizing postdischarge services or follow-up[34,45,47,52,53,59]; a discharge planning protocol (the mandate to discharge patients without the need for physician input or written orders)[39]; early assessment of follow-up needs and resources[31,47,53]; negotiated postoperative involvement by hospital-based nurses with community care providers[51]; general practitioner (GP) input into discharge planning[58]; postdischarge check for follow-up needs, adjustments, and arrangements[30,53]; and creation of a discharge plan containing follow-up needs and arrangements and planned appointments and recommendations [34,45,47,50,52,59,62].

Communication

Twenty-two of the 31 studies examining an intervention with a focus on improving communication showed a statistically significant improvement in continuity of care[28,32,34,38,43,45,46,48,51,57,58,60], hospital use[34,35,44,47,48,50,59,62], patient status[32,34,42,45,50,52–54,58,62], and primary care use[34]. Studies explicitly described interventions with a liaison nurse or liaison pharmacist to improve communication with community care providers[42,46,51,52] and the use of fax[32,34,35,45,46,48,51] or e-mail[28,44] to transmit discharge summaries, plans, and other relevant information in a timely manner (e.g., on the day of discharge). Afilalo and colleagues[43] and Tripp[38] described electronic notifications to inform GPs about patient hospital visits and available discharge information, respectively, and to give them Web-based access to discharge information (e.g., planning and medication regimen). Rutherford and Burge[57] described use of a personal invitation by telephone for GPs to visit the hospital at patient admission or to telephone hospital staff for assistance in discharge planning. Harrison and associates[54] described telephone outreach from hospital to home care (within 24 hours after discharge) to notify the primary contact for follow-up consultation, whereas Wells and colleagues[51] described a mobile telephone hotline ensuring 24-hour access to a breast care nurse. Other common effective handover activities were face-to-face meetings in the community or hospital[48,50,53,62], case conferences by telephone[62], or both[59].

Table 3. *Intervention characteristics*

Study, year (reference)	Intervention	Relevant actions	Key players	Setti
Arbaje et al, 2010 [27]	Geriatric floating interdisciplinary transition team	Patient discharge needs assessment with case manager and rehabilitation therapists; 1-page summary of hospitalization and care plan faxed to GP	Geriatric nurse practitioner, geriatrician	Durin hosp after
Chen et al, 2010 [28]	Delivery of electronic discharge summary by e-mail	Discharge summaries sent by e-mail	Resident medical staff, GPs	At di after
Eggink et al, 2010 [29]	Clinical pharmacist discharge service	Review of discharge medication; communicating prescribing errors to the cardiologist; giving patients information; preparation of a written overview of the discharge medication and communication to both the community pharmacist and the general practitioner about this medication	Clinical pharmacist	Durin hosp at di
Rytter et al, 2010 [30]	Comprehensive discharge follow-up	Structured home visits by GP and district nurse; checking discharge letter for follow-up needs, adjustments, and arrangements	GPs, district nurses	After
Shyu et al, 2010 [31]	Interdisciplinary intervention program	Predischarge assessment of resources and needs; organization of follow-up (referrals), if needed	Geriatric nurse, geriatrician	Durin hosp
Graumlich et al, 2009 [32] [33]*	Software-assisted hospital discharge: computerized physician order entry	Clinical decision support; required fields; use of pick lists; standard drug doses; alerts (e.g., pending results at discharge); reminders; online reference information; reconciliation of information (medication); discharge documents automatically generated and sent by fax and postal mail	Hospital physicians	At di
Jack et al, 2009 [34]	Reengineered hospital discharge program	Creation of comprehensive discharge plan; transmitting discharge summary and discharge plan to GP on day of discharge by fax; reconciliation of information (medication); organizing postdischarge services/follow-up	Nurse discharge advocates, hospital pharmacists	Durin hosp at di

Study, year (reference)	Intervention	Relevant actions	Key players	Setting	Info
Koehler et al, 2009 [35]	Supplemental care bundle	Medication reconciliation by study pharmacist; additional time for study care coordinator to identify and address discharge barriers and needs; supplemental structured discharge form given to patient and faxed to GP	Study care coordinator, study pharmacist	Unknown; at discharge	✓
Maslove et al, 2009 [36]	Electronic discharge summary program	Discharge information grouped and structured into 3 separate sections; completing sections by combination of free-text entry, pick lists, and cutting and pasting from electronic patient record; generated summaries electronically signed and authenticated by attending physician, uploaded to hospital information system, and sent to the GPs	Attending hospital physician, house staff	Unknown	✓
Schnipper et al, 2009 [37]	Computerized medication reconciliation tool and process redesign	Creation of a PML from several electronic sources; facilitates reconciliation of the PML with current inpatient medications when discharge orders are written; requires confirmation that the PML has been reconciled with discharge medications	Hospital physicians, hospital nurses	At discharge	✓
Tripp, 2009 [38]	Notification to inform GPs of discharge summary documentation	Automatic notification to GP named in patient's admission record when new discharge summary is stored in patient's EMR	Hospital providers, GPs	Unknown; at discharge	
King, 2008 [39]	Nurse-driven, evidence-based discharge planning protocol	Discharge planning protocol; medication reconciliation; discharge without the need for physician input or written orders	Intervention registered nurses, principal investigator, electrophysiology physicians	During hospitalization; at discharge; after discharge	✓
Lalonde et al, 2008 [40]	Enhanced medication discharge plan	Creation of MDP; reconciliation of information (medication); transmitting MDP to community physician/ pharmacist	Hospital pharmacists	During hospitalization; at discharge	✓

Study, year (reference)	Intervention	Relevant actions	Key players	Setti
Mayo et al, 2008 [41]	Stroke discharge care case management	Contact with the patient's personal physician in the community for arranging an appointment and for documentation about the stroke to be forwarded to the personal physician	Two nurses (case manager)	At di after
Vuong et al, 2008 [42]	Community liaison pharmacy service	Verbal handover from ward to CLP, including the patient's inpatient care plan, discharge summary, and list of discharge medications; home visit from a CLP where any difficulties and potential problems had by the patients were rectified or highlighted for primary care provider intervention; a structured, preformatted consultation report transmitted to relevant primary care providers and accompanied by a brief letter explaining the study and the purpose of the service; direct telephone contact or face-to-face meetings took place when needed	Two qualified clinical pharmacists	After
Afilalo et al, 2007 [43]	Standardized, Web-based, communication system between GPs and ED	Daily advisory or immediate e-mails (to alert GPs that their patient is presented to ED); e-mails provide a link to secure Web site where the GP can view and print the medical report (including discharge planning information and changes in medication regimen)	ED physicians, GPs	Unkn
Schnipper et al, 2006 [44]	Enhanced pharmacist counseling and follow-up	Reconciliation of information (medication); use of EMRs; communication via standard electronic template (e-mail)	Hospital pharmacists	At di after
Preen et al, 2005 [45]	Hospital-coordinated discharge care plan	Creation of discharge plan; communication via standard electronic template; reconciliation of information (discharge care plan); organizing postdischarge services/ follow-up; discharge plan faxed to community care providers	Research nurse, GPs	Durir hosp at dis after

Study, year (reference)	Intervention	Relevant actions	Key players	Setting	
					Info
Bolas et al, 2004 [46]	Hospital-based community liaison pharmacy service	Reconciliation of information (medication); streamlining medication regimens; discharge letter signed off on by junior physician; pharmaceutical discharge letter faxed to community physician and pharmacist at day of discharge	Liaison pharmacist	During hospitalization; at discharge; after discharge	✔
Caplan et al, 2004 [47]	Comprehensive Geriatric Assessment and multidisciplinary intervention	Conducting discussion with GP; creation of discharge plan; assessing needs and initiating or referring to postdischarge services/follow-up	Geriatric nurse (case manager), multidisciplinary outreach team, and GP	After discharge	
Crotty et al, 2004 [48]	Pharmacist transition coordinator	Discharge summary faxed to community physician and pharmacist on patient's discharge; reconciliation of information (medication); case conference (providing GP and community pharmacist with information about medication use and appropriateness and issues that require monitoring)	Pharmacist transition coordinator, community physician and pharmacist, registered nurse of long-term stay facility	At discharge; after discharge	✔
Kwok et al, 2004 [49]	Intensive community nurse-supported discharge program	Organizing postdischarge services/follow-up; close liaison between CN and hospital physicians (telephone hotline; pager)	Designated community nurse	After discharge	
Naylor et al, 2004 [50]	APN-directed discharge planning and home follow-up protocol	Creation of discharge plan and follow-up protocol; reconciliation of information (medication and follow-up needs); streamlining medication regimens; face-to-face meetings with patient's physician (in hospital; at follow-up); expertise in management of heart failure fostering collaborative relationships; transmitting summaries of goal progression, unresolved issues, and recommendations to community physician	APNs	During hospitalization; at discharge; after discharge	✔

Study, year (reference)	Intervention	Relevant actions	Key players	Setti
Wells et al, 2004 [51]	Nurse-led early discharge	Preoperative liaison with primary care (in particular, community nurses) to negotiate postoperative involvement; discharge summary faxed to community care providers; patient-held records and care protocols shared with community care providers; 24-h access to breast care nurse via mobile telephone	Liaison breast care nurse	Duri hosp at di after
Lim et al, 2003 [52]	Case management and post–acute care program	Creation of discharge plan; organizing postdischarge services/follow-up; time and expertise; liaison with community service providers	Post–acute care coordinators (hospital-based staff with allied health or nursing backgrounds)	After
Avlund et al, 2002 [53]	Comprehensive follow-up home visits	Home visits of geriatric hospital team member together with home care nurse to assess needs and organize follow-up; negotiated postoperative involvement with community care providers; reporting and discussing medical problems with GP	Geriatric team, home care nurse/ helper, physiotherapist, occupational therapist	At di after
Harrison et al, 2002 [54]	Hospital-to-home transitional care model	Use of protocol to enhance links between hospital and home care; nurse transfer letter transmitted to home care nurse; telephone outreach to home care to notify primary contact person in hospital	Hospital and home care nurses	Durir hosp at di after
Indredavik et al, 2000 [55]	Extended stroke service unit with early supported discharge	Predischarge evaluation of patient needs; primary care informed before discharge; case conference with primary care providers (face-to-face); creation of plan for follow-up (checked at dedicated discharge meeting); allocation of tasks and responsibilities; transmitting follow-up plan and patient information to community physician, nurse, and therapists	Mobile (multi-disciplinary) stroke team	Durir hosp at di after

Study, year (reference)	Intervention	Relevant actions	Key players	Setting	Infor
Nazareth et al, 2001 [56]	Pharmacy discharge plan	Creation of integrated discharge plan; transmitting discharge plan to community pharmacist and physician; liaison with community pharmacist and physician; reconciliation of information (medication)	Hospital and community pharmacists	Unknown; after discharge	✔
Rutherford and Burge, 2001 [57]	Personal invitation to GPs to visit or contact hospital and a special discharge summary	Invitation by telephone for GPs to visit the hospital at patient admission or to telephone hospital staff (to assist with planning); special discharge summary (presented in a distinctive red binder)	GP researchers, research nurse	During hospitalization, after discharge	✔
McInnes et al, 1999 [58]	GP input into discharge planning	Invitations to GPs by the geriatrician to make a predischarge visit; request to the GP to provide written information specific to the individual patient via a consultation sheet (e.g., follow-up recommendations); the GP was able to talk to hospital staff and see the patient and had access to medical notes	GPs, geriatricians	During hospitalization	
Naylor et al, 1999 [59]	APN-centered comprehensive discharge planning and home follow-up protocol	Creation and implementation of discharge plan; physicians write discharge orders within 24 hours; collaboration with physicians to make adjustments in therapies and obtain referrals for needed services; transmitting discharge summaries to community physician and other providers detailing the plans, goal progression, and ongoing concerns	APNs	During hospitalization; after discharge	
van Walraven et al, 1999 [60]	Database-generated discharge summaries	Discharge information grouped and structured by 3 separate, standard forms; discharge forms were completed during hospitalization and entered into a computer database after discharge; use of reminders (stickers) when forms were blank; discharge summaries were generated from database	Second- or third-year internal medicine resident, interns, and medical students (house staff)	During hospitalization; after discharge	✔

Study, year (reference)	Intervention	Relevant actions	Key players	Setti
Siu et al, 1996 [61]	Postdischarge geriatric assessment	Reconciliation of information (medical records); home visit to assess needs and organize follow-up; case conference by interdisciplinary team; transmitting recommendations or requests for follow-up to community physician; providing community physician with annotated literature references and personal contact to enhance community physician's adherence to recommendations; precompleted forms (needing only indication of approval) to facilitate the execution of recommendations when community physician's approval was needed	Nurse practitioner, interdisciplinary team	Duri hosp after
Rich et al, 1993 [62]	Comprehensive multidisciplinary treatment strategy	Reconciliation of information (medication); patient visit and follow-up planning by home care representative and social worker during hospitalization; discharge summary completed at discharge and transmitted to home care	Geriatric cardiac nurse, geriatric cardiologist, dietician, social services, home care	Duri hosp at di unkr

DISCUSSION

To our knowledge, this is the first systematic review of RCTs evaluating the effects of interventions to improve patient handovers between hospital and primary care providers at discharge. Our systematic review of the literature found that most interventions (34 of 36) were multicomponent and most studies (25 of 36) had statistically significant effects in favor of the intervention group in 1 or more outcomes.

We found that efforts are primarily aimed at facilitating the coordination of care and communication between hospital and primary care providers and pharmacists. Limited evidence suggests that effective discharge interventions consist of components or activities that focus on structuring and reconciling discharge information, coordinating follow-up care, and direct and timely communication between providers. Discharge interventions were mainly effective for reducing hospital use (e.g., rehospitalizations or emergency department visits), aspects that related to the improvement of continuity of care after discharge (e.g., timeliness and accuracy of discharge information received by or accessible to the GP), and improvement of patient status (e.g., quality of life and satisfaction). There is no strong evidence that a single intervention is regularly associated with positive effects on a specific outcome measure. Most multicomponent discharge interventions that seem to have positive effects on various outcome measures are reported in various ways. Nevertheless, in some studies, we found statistically significant effects in favor of the intervention group for outcome measures that strongly relate to the purpose of a specific component of the intervention studied (e.g., medication reconciliation reducing the percentage of unreconciled medication after discharge).

Our study has limitations. First, despite the relatively high overall methodological quality rating of the included literature, the objectivity and reliability of the data are questionable because only 6 RCTs studied an intervention group with more than 300 participants, and 22 studies (61.1%) either had assessors who were not blinded to the outcomes or had unknown blinding status. Second, many of the studies that we reviewed had diffuse aims and lacked sufficient and clear descriptions of the interventions. Third, many interventions consisted of a complex set of activities or tools that sought to improve the handover between hospital and primary care providers as well as handovers between care providers and patients or their relatives (e.g., discharge instructions, education, or home visits). Fourth, like other reviews of patient handovers[15,21], our review deals with complex interventions, including the number of interactions between components, the number and difficulty of behaviors required by those delivering or receiving the interventions, the number of groups or organizational levels targeted by the interventions, the number and variability of outcomes, and the permitted degree of flexibility or tailoring of the intervention[63]. Also, most studies contain specific components that have not been studied outside of their multicomponent bundle[14]. These aspects hinder an appropriate and direct evaluation of the interventions. Fifth, we found great variability in control conditions, patient populations, outcome definition, methods of outcome measurement, and outcome assessment times and a high degree of clinical diversity, which makes synthesizing results and drawing conclusions difficult. Sixth, many studies used outcomes that are not considered suitable for measuring the effectiveness of patient handovers between hospital and primary care providers at discharge (e.g., outcomes related to patient status). There is a possibility that interventions have an effect but that the measurements of their outcomes are unreliable or are not sensitive enough to be measured[64,65]. Seventh, our review may have been influenced by publication bias; unpublished studies on this subject may be more likely to have negative results. Finally, our search strategy was limited to English-language studies and did not include unpublished abstracts from conference proceedings or nonindexed journals.

We believe that promising interventions for improving patient handovers exist but require further investigation. For example, medication reconciliation, creation of a discharge plan, and use of electronic discharge notifications and Web-based access to discharge information for GPs were included in 11, 7, and 2 reviewed RCTs, respectively, that showed statistically significant effects. The evidence suggests that the recommendations for practice must be tempered by the sparse evidence and the limitations described earlier. The strong methodological quality of these studies supports the reliability of the findings of this review. The need for these types of interventions is supported by various studies showing medication discrepancies, ineffective planning, and delayed or absent patient information to primary care providers as major deficits in the discharge process[6]. These deficits increase the chance of lower quality of care and adverse clinical outcomes[6,8,66]. We also believe, on the basis of the findings of these studies and those of our review, that more attention should be directed to developing standardized measures of continuity of care (e.g., timeliness and accuracy of discharge information) for a better evaluation of, and comparison between, discharge interventions.

Although professional attitudes and aspects of organizational culture are increasingly considered to be important factors in influencing the quality and safety of handovers[67,68], surprisingly, only 3 of the studies described the intended actions with the aim to influence the attitudes of care providers[50,57,61]. Also, we found no studies that described education or training on how to conduct effective handovers as an intervention itself, which is all the more surprising given current literature suggesting that the lack of formal handover training or education is an important cause for poor communication and coordination among providers at handovers within the hospital[19] and the hospital – primary care interface[11,67,69,70]. This is especially important with the increase in handovers done by junior physicians and nurses, who often are neither prepared nor supervised[11,19].

In conclusion, many interventions aimed at improving the discharge quality and safety of handovers between hospital and primary care providers have a positive effect on improving patient care. They are increasingly embraced as best practices by hospitals in such existing and promising initiatives as BOOST (Better Outcomes for Older adults through Safe Transitions)[71] and STAAR (State Action on Avoidable Rehospitalizations)[72]. However, our review shows that the description of the intervention's aim and components, the heterogeneity of the interventions and study characteristics, and the validity of the outcome measurements hinder the demonstration of robust evidence to support the interventions. The mechanisms underlying these interventions that improve the quality and safety of handovers between hospital and primary care providers at discharge is still unknown. Our review also outlines a rich area for several key research questions, including developing a clearer description of the interventions, using uniform and valid outcome measures, and attending to the care provider's attitudes and training in developing effective handover interventions.

REFERENCES

1. Forster AJ, Clark HD, Menard A, et al. Adverse events among medical patients after discharge from hospital. CMAJ 2004;170:345-9.
2. McKenna H, Keeney S, Glenn A, et al. Discharge planning: an exploratory study. J Clin Nurs 2000;9:594-601.
3. Hellesø R, Lorensen M, Sorensen L. Challenging the information gap–the patients transfer from hospital to home health care. Int J Med Inform 2004;73:569-80.
4. Atwal A. Nurses' perceptions of discharge planning in acute health care: a case study in one British teaching hospital. J Adv Nurs 2002;39:450-8.
5. Boockvar K, Fishman E, Kyriacou CK, et al. Adverse events due to discontinuations in drug use and dose changes in patients transferred between acute and long-term care facilities. Arch Intern Med 2004;164:545-50.
6. Kripalani S, LeFevre F, Phillips CO, et al. Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. JAMA 2007;297:831-41.
7. Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161-7.
8. Moore C, Wisnivesky J, Williams S, et al. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. J Gen Intern Med 2003;18:646-51.
9. Murtaugh CM, Litke A. Transitions through postacute and long-term care settings: patterns of use and outcomes for a national cohort of elders. Med Care 2002;40:227-36.
10. Clare J, Hofmeyer A. Discharge planning and continuity of care for aged people: indicators of satisfaction and implications for practice. Aust J Adv Nurs 1998;16:7-13.
11. McKeown F. The experiences of older people on discharge from hospital following assessment by the public health nurse. J Clin Nurs 2007;16:469-76.
12. Mistiaen P, Duijnhouwer E, Wijkel D, et al. The problems of elderly people at home one week after discharge from an acute care setting. J Adv Nurs 1997;25:1233-40.
13. Coleman EA. Falling through the cracks: challenges and opportunities for improving transitional care for persons with continuous complex care needs. J Am Geriatr Soc 2003;51:549-55.
14. Hansen LO, Young RS, Hinami K, et al. Interventions to reduce 30-day rehospitalization: a systematic review. Ann Intern Med 2011; 155:520-8.
15. Chiu WK, Newcomer R. A systematic review of nurse-assisted case management to improve hospital discharge transition outcomes for the elderly. Prof Case Manag 2007;12:330-6; quiz 337-8.
16. Shepperd S, Parkes J, McClaren J, et al. Discharge planning from hospital to home. Cochrane Database Syst Rev 2004:CD000313.
17. Raduma-Tomàs MA, Flin R, Yule S, et al. Doctors' handovers in hospitals: a literature review. BMJ Qual Saf 2011;20:128-33.
18. Arora VM, Manjarrez E, Dressler DD, et al. Hospitalist handoffs: a systematic review and task force recommendations. J Hosp Med 2009;4:433-40.
19. Parker SG, Peet SM, McPherson A, et al. A systematic review of discharge arrangements for older people. Health Technol Assess 2002;6:1-183.
20. Akbari A, Mayhew A, Al-Alawi MA, et al. Interventions to improve outpatient referrals from primary care to secondary care. Cochrane Database Syst Rev 2008:CD005471.
21. Mistiaen P, Francke AL, Poot E. Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic meta-review. BMC Health Serv Res 2007;7:47.
22. Mistiaen P, Poot E. Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home. Cochrane Database Syst Rev 2006:CD004510.
23. Higgins J, Green S. Cochrane Handbook for Systematic Reviews of Interventions. Chichester, United Kingdom: J Wiley, 2006.
24. Grimshaw J, McAuley LM, Bero LA, et al. Systematic reviews of the effectiveness of quality improvement strategies and programmes. Qual Saf Health Care 2003;12:298-303.
25. Naylor M, Brooten D, Jones R, et al. Comprehensive discharge planning for the hospitalized elderly. A randomized clinical trial. Ann Intern Med 1994;120:999-1006.
26. Lin PC, Wang CH, Chen CS, et al. To evaluate the effectiveness of a discharge-planning programme for hip fracture patients. J Clin Nurs 2009;18:1632-9.

27. Arbaje AI, Maron DD, Yu Q, et al. The geriatric floating interdisciplinary transition team. J Am Geriatr Soc 2010;58:364-70.
28. Chen Y, Brennan N, Magrabi F. Is email an effective method for hospital discharge communication? A randomized controlled trial to examine delivery of computer-generated discharge summaries by email, fax, post and patient hand delivery. Int J Med Inform 2010;79:167-72.
29. Eggink RN, Lenderink AW, Widdershoven JW, et al. The effect of a clinical pharmacist discharge service on medication discrepancies in patients with heart failure. Pharm World Sci 2010;32:759-66.
30. Rytter L, Jakobsen HN, Rønholt F, et al. Comprehensive discharge follow-up in patients' homes by GPs and district nurses of elderly patients. A randomized controlled trial. Scand J Prim Health Care 2010;28:146-53.
31. Shyu YI, Liang J, Wu CC, et al. Two-year effects of interdisciplinary intervention for hip fracture in older Taiwanese. J Am Geriatr Soc 2010;58:1081-9.
32. Graumlich JF, Novotny NL, Nace GS, et al. Patient and physician perceptions after software-assisted hospital discharge: cluster randomized trial. J Hosp Med 2009;4:356-63.
33. Graumlich JF, Novotny NL, Stephen Nace G, et al. Patient readmissions, emergency visits, and adverse events after software-assisted discharge from hospital: cluster randomized trial. J Hosp Med 2009;4:E11-9.
34. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. Ann Intern Med 2009;150:178-87.
35. Koehler BE, Richter KM, Youngblood L, et al. Reduction of 30-day postdischarge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle. J Hosp Med 2009;4:211-8.
36. Maslove DM, Leiter RE, Griesman J, et al. Electronic versus dictated hospital discharge summaries: a randomized controlled trial. J Gen Intern Med 2009;24:995-1001.
37. Schnipper JL, Hamann C, Ndumele CD, et al. Effect of an electronic medication reconciliation application and process redesign on potential adverse drug events: a cluster-randomized trial. Arch Intern Med 2009;169:771-80.
38. Tripp JS. Development and Evaluation of Notifications to Inform Primary Care Providers of Summary Documentation for Their Patients' Hospital Visits [Dissertation]. Salt Lake City, UT: University of Utah, 2009.
39. King TL. The Impact of a Nurse-Driven Evidence-Based Discharge Planning Protocol on Organizational Efficiency and Patient Satisfaction in Patients with Cardiac Implants [Dissertation]. Orlando, FL: University of Central Florida, 2008.
40. Lalonde L, Lampron AM, Vanier MC, et al. Effectiveness of a medication discharge plan for transitions of care from hospital to outpatient settings. Am J Health Syst Pharm 2008;65:1451-7.
41. Mayo NE, Nadeau L, Ahmed S, et al. Bridging the gap: the effectiveness of teaming a stroke coordinator with patient's personal physician on the outcome of stroke. Age Ageing 2008;37:32-8.
42. Vuong T, Marriott JL, Kong DCM, et al. Implementation of a community liaison pharmacy service: a randomised controlled trial. Int J Pharm Pract 2008;16:127-35.
43. Afilalo M, Lang E, Léger R, et al. Impact of a standardized communication system on continuity of care between family physicians and the emergency department. CJEM 2007;9:79-86.
44. Schnipper JL, Kirwin JL, Cotugno MC, et al. Role of pharmacist counseling in preventing adverse drug events after hospitalization. Arch Intern Med 2006;166:565-71.
45. Preen DB, Bailey BE, Wright A, et al. Effects of a multidisciplinary, post-discharge continuance of care intervention on quality of life, discharge satisfaction, and hospital length of stay: a randomized controlled trial. Int J Qual Health Care 2005;17:43-51.
46. Bolas H, Brookes K, Scott M, et al. Evaluation of a hospital-based community liaison pharmacy service in Northern Ireland. Pharm World Sci 2004;26:114-20.
47. Caplan GA, Williams AJ, Daly B, et al. A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department – the DEED II study. J Am Geriatr Soc 2004;52:1417-23.
48. Crotty M, Rowett D, Spurling L, Giles LC, Phillips PA. 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 of a randomized, controlled trial. Am J Geriatr Pharmacother 2004;2:257-64.

49. Kwok T, Lum CM, Chan HS, et al. A randomized, controlled trial of an intensive community nurse-supported discharge program in preventing hospital readmissions of older patients with chronic lung disease. J Am Geriatr Soc 2004;52:1240-6.
501. Naylor MD, Brooten DA, Campbell RL, et al. Transitional care of older adults hospitalized with heart failure: a randomized, controlled trial. J Am Geriatr Soc 2004;52:675-84.
51. Wells M, Harrow A, Donnan P, et al. Patient, carer and health service outcomes of nurse-led early discharge after breast cancer surgery: a randomised controlled trial. Br J Cancer 2004;91:651-8.
52. Lim WK, Lambert SF, Gray LC. Effectiveness of case management and post-acute services in older people after hospital discharge. Med J Aust 2003;178:262-6.
53. Avlund K, Jepsen E, Vass M, et al. Effects of comprehensive follow-up home visits after hospitalization on functional ability and readmissions among old patients. A randomized controlled study. Scand J Occup Ther 2002;9:17-22.
54. Harrison MB, Browne GB, Roberts J, et al. Quality of life of individuals with heart failure: a randomized trial of the effectiveness of two models of hospital-to-home transition. Med Care 2002;40:271-82.
55. Indredavik B, Fjaertoft H, Ekeberg G, et al. Benefit of an extended stroke unit service with early supported discharge: a randomized, controlled trial. Stroke 2000;31:2989-94.
56. Nazareth I, Burton A, Shulman S, et al. A pharmacy discharge plan for hospitalized elderly patients – a randomized controlled trial. Age Ageing 2001;30:33-40.
57. Rutherford A, Burge B. General practitioners and hospitals. Continuity of care. Aust Fam Physician 2001;30:1101-7.
58. McInnes E, Mira M, Atkin N, et al. Can GP input into discharge planning result in better outcomes for the frail aged: results from a randomized controlled trial. Fam Pract 1999;16:289-93.
59. Naylor MD, Brooten D, Campbell R, et al. Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial. JAMA 1999;281:613-20.
60. van Walraven C, Laupacis A, Seth R, et al. Dictated versus database generated discharge summaries: a randomized clinical trial. CMAJ 1999;160: 319-26.
61. Siu AL, Kravitz RL, Keeler E, et al. Postdischarge geriatric assessment of hospitalized frail elderly patients. Arch Intern Med 1996;156:76-81.
62. Rich MW, Vinson JM, Sperry JC, et al. Prevention of readmission in elderly patients with congestive heart failure: results of a prospective, randomized pilot study. J Gen Intern Med 1993;8:585-90.
63. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ 2008;337:a1655.
64. Mistiaen P. Hospital Discharge: Problems and Interventions [PhD thesis]. Utrecht, the Netherlands: Netherlands Inst for Health Services Research, 2007.
65. Lilford R, Pronovost P. Using hospital mortality rates to judge hospital performance: a bad idea that just won't go away. BMJ 2010;340:c2016.
66. van Walraven C, Seth R, Austin PC, et al. Effect of discharge summary availability during post-discharge visits on hospital readmission. J Gen Intern Med 2002;17:186-92.
67. Connolly M, Grimshaw J, Dodd M, et al. Systems and people under pressure: the discharge process in an acute hospital. J Clin Nurs 2009;18:549-58.
68. Hellesø R, Fagermoen MS. Cultural diversity between hospital and community nurses: implications for continuity of care. Int J Integr Care 2010;10:e036.
69. Brand SL. Nurses' roles in discharge decision making in an adult high dependency unit. Intensive Crit Care Nurs 2006;22:106-14.
70. Johnson JK, Arora VM. Improving clinical handovers: creating local solutions for a global problem. Qual Saf Health Care 2009;18:244-5.
71. Society of Hospital Medicine. BOOSTing Care Transitions Resource Room. Philadelphia: Soc of Hospital Medicine; 2008. Accessed at www.hospitalmedicine.org/ResourceRoomRedesign/RR_CareTransitions/CT_Home.cfm on 1 January 2012.
72. Institute for Healthcare Improvement. State Action on Avoidable Rehospitalizations (STAAR) Initiative. Cambridge, MA: Inst for Healthcare Improvement; 2012. Accessed at www.ihi.org/staar on 1 January 2012.

APPENDICES

Appendix 1. Search strings, by database

PubMed (1990–2011)

Search Strategy

((((((hospital discharg*[tiab])) OR ((((patient discharge[Mesh])) AND ((hospital[tiab] OR hospitals[tiab] OR home[tiab]))))) OR (((((patient[tiab] OR patients[tiab] OR client*[tiab] OR subject*[tiab])) AND ((discharg*[tiab] OR transfer*[tiab] OR transition*[tiab] OR "aftercare"[Mesh]))) AND ((hospital[tiab] OR hospitals[tiab] OR home[tiab])))))) AND (("Home-care services" OR "Discharge plan" OR "Discharge summary" OR "Community health nursing" OR "Discharge planning" OR telemedicine OR (postdischarge AND support) OR (Home AND (intervention OR rehabilitation) AND (program OR programme OR programs OR programmes)) OR (nurse[tw] AND consultant) OR (medication instruction) OR (discharge AND education) OR (telephone follow up) OR (discharge AND service) OR "Liaison nurse" OR "hospital discharge preparation" OR "discharge rounds" OR telemedicine OR "intermediate care units" OR (posthospital AND support) OR (discharge AND coordinator*)))) AND ((Randomized controlled trial[PT]))

Hits: 870

CINAHL (1990–2011)

Search Strategy

(PT clinical trial or (TI Randomi?ed control$ trial$ or AB Randomi?ed control$ trial$) or (random assignment) or ((TI control* or AB control*) and (TI random* or AB random*) and (TI trial* or AB trial*)) or (TI random* or AB random*) and (TI trial* or AB trial*) and (TI clinical* or AB clinical*)) And (MH home visits or MH discharge planning or MH telemedicine or MH community health nursing or MH patient discharge education or MH after care) And (((TI hospital discharg* or AB hospital discharg*) or ((MW patient discharge or AB patient discharg*) and (TI hospital or AB hospital or TI hospitals or AB hospitals or TI home or AB home or AB "hospital to community" or MW hospitals or MW hospital))) or (((TI discharg* or AB discharg*) or (TI transfer* or AB transfer*) or (TI transition* or AB transition*) or (AB aftercare)) and ((TI home or AB home or AB "hospital to community" or MW hospital or MW hospitals or TI hospital or AB hospital or TI hospitals or AB hospitals)) and ((TI patient or AB patient or TI patients or AB patients or TI client* or AB client* or AB consumer* or AB recipient*) or AB subject*)))

Hits: 115

PsycInfo (1990–2011)

Search Strategy

(((hospital.ti. or hospital.ab. or hospital.hw. or hospitals.ti. or hospitals.ab. or home.ti. or home.ab. or patient.ti. or patient.ab. or patients.ti. or patients.ab. or client*.ti. or client*.ab. or client*.hw. or consumer*.ti. or consumer*.ab. or recipient*.ti. or recipient*.ab. or subject*.ti. or subject*.ab. or discharg*.ti. or discharg*.ab. or transfer*.ti. or transfer*.ab. or transition*.ti. or transition*.ab. or aftercare/ or aftercare.ti. or aftercare.ab.) or ((hospital discharge.sh. or (hospital adj discharg*).ti. or (hospital adj discharg*).ab. or (hospital.ti. or hospital.ab. or hospital.hw. or hospitals.ti. or hospitals.ab. or home.ti. or home.ab.) and (patient adj discharges).ab.))) and ((random:.ti. or random:.ab. or (((singl: or doubl: or trebl: or tripl:) adj5 blind).ti. or ((singl: or doubl: or trebl: or tripl:) adj5 blind).ab. or ((singl: or doubl: or trebl: or tripl:) adj5 blind).tc. or ((singl: or doubl: or trebl: or tripl:) adj5 blind).id.) or experimental design.sh. or clinical trial.id. or ((clin: adj25 trial:).ti. or (clin: adj25 trial:).ab.) or clinical trial:.ti. or clinical trial:.ab. or clinical trial:.tc. or clinical trial:.id. or experimentation.sh. or placebo:.ti. or placebo:.ab. or placebo:.tc. or placebo:.id. or methodology.sh. (or treatment effectiveness evaluation.sh. or double blind.ti. or double blind.ab. or double blind.tc. or double blind.id. or (random: and allocat:).ti. or (random: and allocat:).ab. or (random: and allocat:).tc. or (random: and allocat:).id. or (random: and trial:).ti. or (random: and trial:).ab. or (random: and trial:).tc. or (random: and trial:).id. or single blind.ti. or single blind.ab. or single blind.tc. or single blind.id.) and(exp "Continuum of Care"/ or exp Telemedicine/ or exp Health Care Services/ or exp Home Care/ or exp Discharge Planning/ or exp Home Care Personnel/ or exp Home Visiting Programs/)

Hits: 177

Cochrane Library (1990–2011)

Search Strategy

(hospital discharge or patient discharge):ti,ab,kw and (hospital or hospitals or home or patient or patients or client or subject):ti,ab,kw and (Discharge or transfer or transition or aftercare):ti,ab,kw and (Home-care services or Discharge plan or Discharge summary or Community health nursing or Discharge planning or telemedicine or support or intervention or rehabilitation or program or programme or programs or programmes or nurse or consultant or medication or instruction or education or telephone or service or liaison or preparation or discharge rounds or telemedicine or intermediate care units or coordinator):ti,ab,kw and (randomized controlled trial):ti,ab,kw, from 1990 to 2012 in Clinical Trials

Hits: 1371

EMBASE (1990–2011)

Search Strategy

1 (hospital discharge or patient discharge).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (55871)
2 (hospital or hospitals or home or patient or patients or client or subject).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (5756986)
3 (Discharge or transfer or transition or aftercare).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (660677)
4 (Hospital or hospitals or home).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (1215905)
5 (Home-care services or Discharge plan or Discharge summary or Community health nursing or Discharge planning or telemedicine or support or intervention or rehabilitation or program or programme or programs or programmes or nurse or consultant or medication or instruction or education or telephone or service or liaison or preparation or discharge rounds or telemedicine or intermediate care units or coordinator).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword] (2914640)
6 randomized controlled trial/ (296357)
7 1 and 2 and 3 and 4 and 5 and 6 (1276)
8 7 and "Journal: Article".sa_pubt. (1107)
9 8 and 1990:2012.(sa_year). (1096)
10 9 and "controlled study".sa_suba. (1041)
11 10 and "controlled study".sa_suba. (1041)
12 7 and 11 (1041)

Hits: 1041

Appendix 2. Quality rating of included studies

Study, Year (Reference)	Randomization	Allocation Concealment	Similarity of groups at baseline	Inclusion/ exclusion criteria specified	Providers/ participants blinded
Arbaje et al, 2010 [27]	Yes	Unknown	Yes	Yes	NP
Chen et al, 2010 [28]	Yes	Yes	Yes	Yes	NP
Eggink et al, 2010 [29]	Yes	No	Yes	Yes	NP
Rytter et al, 2010 [30]	Yes	Yes	No	Yes	NP
Shyu et al, 2010 [31]	Yes	Unknown	Yes	Yes	NP
Graumlich et al, 2009 [32,33]*	Yes	Yes	Yes	Yes	NP
Jack et al, 2009 [34]	Yes	Yes	Yes	Yes	NP
Koehler et al, 2009 [35]	Yes	Yes	Yes	Yes	NP
Lin et al, 2009 [26]	Yes	No	No	Yes	NP
Maslove et al, 2009 [36]	Yes	No	Yes	Yes	NP
Schnipper et al, 2009 [37]	Yes	Yes	Yes	Yes	NP
Tripp, 2009 [38]	Yes	Unknown	No	Yes	NP
King, 2008 [39]	Yes	Yes	Yes	Yes	NP
Lalonde et al, 2008 [40]	Yes	Yes	Yes	Yes	NP
Mayo et al, 2008 [41]	Yes	Yes	Yes	Yes	NP
Vuong et al, 2008 [42]	Yes	Yes	No	Yes	NP
Afilalo et al, 2007 [43]	Yes	Yes	Yes	Yes	NP
Schnipper et al, 2006 [44]	Yes	Yes	Yes	Yes	NP
Preen et al, 2005 [45]	Yes	Yes	Yes	Yes	NP
Bolas et al, 2004 [46]	Yes	Yes	Yes	Yes	NP
Caplan et al, 2004 [47]	Yes	No	Yes	Yes	NP
Crotty et al, 2004 [48]	Yes	Yes	No	Yes	NP
Kwok et al, 2004 [49]	Yes	Yes	No	Yes	NP
Naylor et al, 2004 [50]	Yes	Yes	No	Yes	NP
Wells et al, 2004 [51]	Yes	Unknown	Yes	Yes	NP
Lim et al, 2003 [52]	Yes	Yes	Yes	Yes	NP
Avlund et al, 2002 [53]	Yes	No	Yes	Yes	NP
Harrison et al, 2002 [54]	Yes	Yes	Yes	Yes	NP
Indredavik et al, 2000 [55]	Yes	Yes	Yes	Yes	NP
Nazareth et al, 2001 [56]	Yes	Yes	Yes	Yes	NP
Rutherford and Burge, 2001 [57]	Yes	Yes	Yes	No	NP
McInnes et al, 1999 [58]	Yes	Yes	Yes	Yes	NP
Naylor et al, 1999 [59]	Yes	Yes	Yes	Yes	NP
van Walraven et al, 1999 [60]	Yes	Yes	No	Yes	NP
Siu et al, 1996 [61]	Yes	Yes	No	Yes	NP
Naylor et al, 1994 [25]	Yes	Unknown	No	Yes	NP
Rich et al, 1993 [62]	Yes	Yes	Yes	Yes	NP

NP = not possible.

* Two separate studies using the same intervention, setting, and population but different outcome measures.

Assessors blinded to outcome	Attrition rate reported	Characteristics of participants lost to follow-up described	Intention-to-treat analysis	Power analysis calculated	Total
Yes	Yes	Yes	Yes	Yes	8
Unknown	Yes	Yes	No	No	6
No	Yes	No	No	Yes	5
Unknown	No	Yes	Yes	Yes	6
Yes	Yes	Yes	Yes	Yes	8
Yes	Yes	Yes	Yes	Yes	9
Yes	Yes	Yes	Yes	Yes	9
Yes	Yes	Yes	Yes	No	8
No	No	No	No	No	2
No	Yes	Yes	Unknown	Yes	6
No	Yes	Yes	Yes	Yes	8
Unknown	No	No	Yes	Yes	4
Unknown	Yes	Yes	No	Yes	7
Yes	No	No	Yes	Yes	7
Yes	Yes	Yes	Yes	Yes	9
Unknown	Yes	Yes	Unknown	Yes	6
No	Yes	No	Yes	Yes	7
Yes	Yes	Yes	Yes	Yes	9
Unknown	No	No	Yes	Yes	6
Unknown	Yes	Yes	Unknown	No	6
No	Yes	Yes	Unknown	Yes	6
Yes	Yes	Yes	Yes	Yes	8
No	Yes	Yes	No	Yes	6
Yes	Yes	Yes	Yes	Yes	8
No	Yes	Yes	Yes	Yes	7
Yes	Yes	Yes	Yes	Yes	9
Yes	Yes	Yes	No	Yes	7
No	Yes	Yes	Yes	Yes	8
Yes	Unknown	No	Yes	No	6
Unknown	Yes	Yes	Unknown	Yes	7
Unknown	Yes	Yes	No	No	5
No	Yes	No	Yes	No	6
Yes	Yes	Yes	Yes	Yes	9
Unknown	Yes	Yes	No	Yes	6
Yes	Yes	Yes	Yes	No	7
No	Yes	No	No	No	3
No	Yes	No	No	No	5

Appendix 3. Characteristics and findings of included studies

Study, year (reference)	Setting (country)	Participants, *n*		Intervention vs. control (classification[a])
		Intervention group	Control group	
Arbaje et al, 2010 [27]	Elderly patients admitted to 4 general medicine teaching services at an academic medical center (United States)	366	351	Geriatric floating interdisciplinary transition team vs. usual care (2, 3)
Chen et al, 2010 [28]	Geriatric patients admitted to the acute aged care ward of a metropolitan teaching hospital (Australia)	40 (e-mail)	48 (fax), 40 (post), 40 (patient)	Delivery of computer-based discharge summaries from hospital to GP by e-mail vs. by fax, post, or patient hand delivery (3)
Eggink et al, 2010 [29]	Patients admitted to the department of cardiology of a teaching hospital (the Netherlands)	41	44	Clinical pharmacist discharge service vs. usual care
Rytter et al, 2010 [30]	Elderly patients discharged from the geriatric or internal medical ward at a large teaching hospital (Denmark)	166	165	Comprehensive discharge follow-up in patients' homes by GPs and district nurses vs. usual discharge care (2)
Shyu et al, 2010 [31]	Elderly patients hospitalized for accidental singe-side hip fracture receiving hip arthroplasty or internal fixation (Taiwan)	80	82	Interdisciplinary intervention program vs. usual discharge care (2)
Graumlich et al, 2009 [32]	Hospital physicians and their patients admitted to a tertiary care, teaching hospital (United States)	35 (HP), 316 (patient)	35 (HP), 315 (patient)	Software-assisted hospital discharge vs. usual care, handwritten discharge (1, 2, 3)
Graumlich et al, 2009 [33]	Hospital physicians and their patients admitted to a tertiary care, teaching hospital (United States)	35 (HP), 316 (patient)	35 (HP), 315 (patient)	Software-assisted hospital discharge vs. usual care, handwritten discharge (1, 2, 3)
Jack et al, 2009 [34]	Patients admitted to a general medical service at an urban, academic, safety net hospital (United States)	370	368	Reengineered hospital discharge program vs. usual discharge planning (1, 2, 3)
Koehler et al, 2009 [35]	Elderly patients admitted to a hospital medicine unit at a university medical center (United States)	20	21	Supplemental care bundle vs. usual care (1, 2, 3)
Maslove et al, 2009 [36]	Patients discharged from a general internal medicine service at a tertiary care, teaching, university-affiliated hospital (Canada)	105	104	Electronic discharge summary program vs. conventional dictated discharge summaries (1, 3)

Results			
Outcome[b]	**Intervention group**	**Control group**	***P* value**
GP knowledge of patient's experiences in the hospital by 14 d, %	76.7	72.2	0.160
Length of hospital stay by 14 d, %	72.3	66.4	0.42
Discharge summaries received by GP by 1 wk, %	73.9 (e-mail)	69.4 (fax); 43.8 (post); 24.2 (patient)	<0.001 [c]
At least 1 discrepancy or prescription error within 6 wk, %	39	68	NR
Medications with a discrepancy or prescription error within 6 wk, %	6.1	14.6	NR
Medication adherence [d]	78.0	79.5	NR
Patient medication that GP did not know about by 12 wk, %	34	48	0.020
GP reporting medication that patients did not receive by 12 wk, %	28	39	0.050
Planned clinical control completed as recommended by 12 wk, %	95	72	0.020
Planned paraclinical control completed as recommended by 12 wk, %	88	68	0.090
GP very well-informed about patient hospitalization by 12 wk, %	42	16	0.010
Improvement of quality of life (SF-36) by 3 mo, PCS score	NR	NR	<0.001
Improvement of quality of life (SF-36) by 3 mo, MCS score	NR	NR	NS
Death by 3 mo	NR	NR	NS
Service use by 3 mo	NR	NR	NS
Mean patient perception of discharge preparedness (B-PREPARED scale) by 1 wk (SD)	17.7 (4.1)	17.2 (4.0)	0.040
Mean patient satisfaction with medication information (SIMS) by 1 wk (SD)	12.3 (4.8)	12.1 (4.6)	0.57
Mean outpatient physician perception of timeliness of communication and adequacy of discharge plan (Modified Physician-PREPARED scale) by 19 d (SD)	17.2 (3.8)	16.5 (3.9)	0.030
Adverse event within 1 mo, %	7.3	7.3	0.88
Hospital visits per person within 1 mo	0.3	0.5	0.009
Follow-up visits by GP within 1 mo, %	44	62	0.001
ED visits per person within 1 mo	0.2	0.2	0.014
Rehospitalizations per person within 1 mo	0.1	0.2	0.090
Patients able to identify discharge diagnosis (indicated by interview) by 1 mo, %	79	70	0.017
Patients able to identify GP name (indicated by interview) by 1 mo, %	95	89	0.007
Postdischarge rehospitalizations/ED visits (0 to 30 d), %	10	38	0.030
Postdischarge rehospitalizations/ED visits (31 to 60 d), %	20	5	0.180
Mean quality of discharge summary by 2 wk (SD) [e]	86.4 (15.0)	84.3 (17.6)	0.53
Mean completeness of discharge summary by 2 wk (SD) [e]	88.2 (12.4)	83.5 (19.1)	0.160
Mean discharge summary organization by 2 wk (SD) [e]	88.3 (9.8)	85.5 (17.6)	0.34
Mean timeliness (time from patient discharge to summary receipt) by 2 wk (SD) [e]	88.4 (15.8)	82.9 (21.2)	0.160
Mean house staff satisfaction with method of summary generation by 3 mo [e]	75.7	44.5	0.10
Adverse outcomes within 30 d, %	21	20	0.89

Study, year (reference)	Setting (country)	Participants, *n*		Intervention vs. control (classification[a])
		Intervention group	Control group	
Schnipper et al, 2009 [37]	Patients admitted to general medical inpatient units at 2 academic hospitals (United States)	162	160	Computerized medication reconciliation tool and process redesign involving physicians, nurses, and pharmacists versus usual discharge care
Tripp, 2009 [38]	Patients admitted to inpatient care or ED at 3 hospitals (United States)	397 (inpatient), 1098 (ED)	396 (inpatient), 1107 (ED)	Notification to GPs of discharge summary being stored in patient's electronic medical record vs. no notification (3)
King, 2008 [39]	Patients admitted to a community hospital for cardiac implement placement (United States)	25	28	Nurse-driven, evidence-based discharge planning protocol vs. traditional discharge planning services (1, 2)
Lalonde et al, 2008 [40]	Patients admitted to a geriatric and family medicine ward (Canada)	42	41	Enhanced vs. usual medication discharge plan (1, 2, 3)
Mayo et al, 2008 [41]	Stroke patients returning home directly from 5 acute care hospitals (Canada)	96	94	Postdischarge case management vs. instruction of patients and family to manage postdischarge follow-up (1,2,3)
Vuong et al, 2008 [42]	Patients discharged from 2 acute care tertiary teaching hospitals (Australia)	127	132	Standard care and a home visit from a community liaison pharmacist within 5 d of discharge vs. standard care (discharge counseling, provision of compliance aids, and communication with primary health care providers when necessary)
Afilalo et al, 2007 [43]	Patients consulting a university teaching hospital's ED (Canada)	1048	974	Web-based standardized communication system between ED physicians and GPs vs. usual communication via regular mail (1, 2, 3)

Results

Outcome[b]	**Intervention group**	**Control group**	***P* value**
Potential adverse drug events (per patient) due to unintentional medication discrepancies between prehospitalization medications and hospitalization or discharge medications, *n*	170 (1.05)	230 (1.44)	NR
Documentation accessed by GP, %	79.9 (inpatient)	64.7 (inpatient)	<0.001
Time from creation to GP's first access of documentation, *d*	6.6 (inpatient); 6.8 (ED)	12.2 (inpatient); 14.8 (ED)	<0.001 (inpatient); <0.001 (ED)
Documentation accessed before first follow-up appointment with patient or in first 24 h, %	81.7 (inpatient); 85.8 (ED)	68.3 (inpatient); 78.4 (ED)	0.005 (inpatient); 0.001 (ED)
Time from discharge to scheduling of first follow-up appointment, *d*	12.5 (inpatient); 14.1 (ED)	9.5 (inpatient); 15.4 (ED)	0.039 (inpatient); 0.22 (ED)
Rehospitalization by 30 d, %	7.3 (inpatient); 4.5 (ED)	6.1 (inpatient); 4.5 (ED)	0.57 (inpatient); 1.00 (ED)
Rehospitalization by 60 d, %	11.1 (inpatient); 6.3 (ED)	9.6 (inpatient); 6.4 (ED)	0.56 (inpatient); 0.93 (ED)
ED use by 30 d, %	5.8 (inpatient); 12.6 (ED)	5.1 (inpatient); 12.7 (ED)	0.64 (inpatient); 0.95 (ED)
ED use by 60 d, %	9.1 (inpatient); 17.3 (ED)	8.3 (inpatient); 17.3 (ED)	0.80 (inpatient); 1.00 (ED)
Mean length of hospital stay by 3 d (SD), *min*	1567 (436)	1664 (435)	0.014
Rehospitalizations within 30 d, *n*	3	2	0.52
Mean unreconciled medications by 3 d (SD)	8.9 (18.4)	71.8 (21.4)	<0.001
Mean patient satisfaction (DCS) by 7 to 10 d (SD)	26.5 (2.7)	25.0 (3.2)	0.050
Mean overall health (HDS) by 7 to 10 d (SD)	2.6 (0.8)	3.1 (0.70)	0.020
Mean medication discrepancies between MDP and community pharmacy records by 1 wk (SD)	13.2 (16.6)	15.3 (18.2)	0.60
Mean medication discrepancies between MDP and patient self-report by 1 wk (SD)	10.3 (12.1)	12.1 (15.3)	0.60
Mean quality of life (SF-36) by 6 wk, PCS score (SD)	40.0 (1.3)	38.4 (1.4)	NS
Mean quality of life (SF-36) by 6 wk, MCS score (SD)	6.4 (1.4)	45.6 (1.4)	NS
Unplanned rehospitalizations within 6 wk, %	4.3	3.2	NR
Emergency visits within 6 wk, %	16	14	NR
Mean medications patients reported receiving at the time of follow-up within 8 to 12 wk (SD), *n*	7.55 (3.27)	7.72 (3.27)	0.66
Self-perceived medication understanding by patients within 8 to 12 wk	NR	NR	<0.001
Self-reported medication adherence by patients within 8 to 12 wk[f]	0.23	0.41	0.028
Higher rate of information reception by GP by 21 d, %[g]	73	47	SS
More useful information according to GP by 21 d, %[g]	59	21	SS
Better knowledge of patient's ED visit by GP by 21 d, %[g]	62	21	SS
Better patient management by GPs by 21 d, %**[g]	45	25	SS
More actions initiated by GP on receipt of information by 21 d, %[g]	32	19	SS
Higher rate of follow-up visits in GP offices by 21 d, %[g]	17	14	NS

Study, year (reference)	Setting (country)	Participants, *n*		Intervention vs. control (classification[a])
		Intervention group	Control group	
Schnipper et al, 2006 [44]	Patients admitted to general medicine service at a large teaching hospital (United States)	92	84	Enhanced vs. usual pharmacist counseling and follow-up (1, 3)
Preen et al, 2005 [45]	Patients with chronic cardiorespiratory diagnoses from respiratory, cardiovascular, and general medical wards at 2 tertiary hospitals (Australia)	91	98	Enhanced hospital-coordinated vs. usual discharge care plan (1, 2, 3)
Bolas et al, 2004 [46]	Elderly patients with emergency or unplanned admission who are receiving more than 3 drugs, admitted to the medical unit of a district general hospital (Ireland)	119	124	Hospital-based community liaison pharmacy service vs. standard clinical pharmacy service (1, 3)
Caplan et al, 2004 [47]	Elderly patients discharged from the ED at a large medical, school-affiliated, public hospital (Australia)	370	369	Comprehensive Geriatric Assessment vs. usual ED discharge care plan (2, 3)
Crotty et al, 2004 [48]	Elderly patients making first-time transition from 3 metropolitan public hospitals to a long-term residential care facility (Australia)	56	54	Pharmacist transition coordinator vs. standard hospital discharge summary (1, 2, 3)
Kwok et al, 2004 [49]	Elderly patients with primary diagnosis of chronic lung disease at 2 acute care hospitals (China)	70	79	Intensive CN-supported discharge program vs. usual discharge without CN support (2, 3)
Naylor et al, 2004 [50]	Elderly patients with heart failure admitted to 6 academic and community hospitals (United States)	118	121	APN-directed vs. non–APN-directed discharge planning and home follow-up protocol (1, 2, 3)
Wells et al, 2004 [51]	Patients with breast cancer requiring axillary clearance discharged from a teaching hospital (United Kingdom)	54	54	Nurse-led early discharge vs. conventional hospital stay and discharge (2, 3)
Lim et al, 2003 [52]	Elderly patients discharged from 4 university-affiliated metropolitan general hospitals (Australia)	311	287	Case management and post–acute care program vs. usual discharge planning (provided by ward nursing staff and social work department) (2, 3)

	Results		
Outcome[b]	**Intervention group**	**Control group**	***P* value**
Preventable adverse events within 30 d, *%*	1	11	0.010
Preventable, medication-related ED visits or rehospitalizations within 30 d, *%*	1	8	0.030
General patient satisfaction by 30 d, *%*	85	88	0.63
Any medication discrepancy by 30 d, *%*	61	65	0.72
Nonadherence to at least 1 medication by 30 d, *%*	54	53	>0.99
Mean quality of life (SF-12) by 7 d, MCS score (SD)	42.4 (5.6)	40.9 (5.7)	0.055
Mean quality of life (SF-12) by 7 d, PCS score (SD)	27.2 (4.5)	27.2 (4.1)	NS
Mean patient satisfaction with discharge process by 7 d (SD) [h]	3.2 (0.6)	3.0 (0.5)	0.100
Mean GP satisfaction with patient's overall discharge process by 7 d (SD) [h]	3.2 (0.6)	3.4 (0.7)	0.36
Time taken for discharging hospitals to contact GPs by 7 d	NR	NR	0.002
Mean length of hospital stay (SD), *d*	11.6 (5.7)	12.4 (7.4)	NS
Mismatch in drug name prescribed in discharge letter and by GP by 10 to 14 d, *%*	1.5	7	<0.005
Mismatch in drug dose prescribed in discharge letter and by GP by 10 to 14 d, *%*	10	17	<0.070
Mismatch in dosage frequency prescribed in discharge letter and by GP by 10 to 14 d, *%*	11	18	<0.004
Emergency rehospitalizations within 3 mo	NR	NR	>0.050
Hospitalizations within 1 mo, *%*	16.5	22.2	0.048
Emergency admissions within 1 mo, *%*	11.9	14.4	0.31
GP visits within 1 mo, *%*	75.9	71.5	NS
Mean quality of prescribing medication (MAI score) by 8 wk	2.5	6.5	0.007
Hospital use by 8 wk, *%*	5	13	0.035
Adverse drug event by 8 wk, *%*	45.5	43.2	0.83
Unplanned rehospitalizations within 28 d, *%*	47	37	0.24
Patients alive and with no rehospitalization within 30 d, *%*	86.9	73.7	SS
Patients alive and with no rehospitalization within 60 d, *%*	75.0	62.1	SS
Patients alive and with no rehospitalization within 90 d, *%*	7.1	55.8	SS
Mean overall quality of life (MLHFQ score) by 2 wk (SD)	3.0 (1.2)	2.7 (1.2)	0.070
Mean overall quality of life (MLHFQ score) by 6 wk (SD)	3.1 (1.3)	2.9 (1.4)	NR
Mean overall quality of life (MLHFQ score) by 12 wk (SD)	3.2 (1.5)	2.7 (1.5)	<0.050
Mean patient satisfaction by 2 wk (SD) [i]	83.0 (10.3)	74.6 (10.4)	<0.001
Mean patient satisfaction by 6 wk (SD) [i]	83.1 (9.6)	77.8 (11.2)	<0.001
Mean quality of life (FACT-B score) by 2 wk[j]	109	108	NS
Mean quality of life (FACT-B score) by 4 wk[j]	118	118	NS
Mean caregiver strain (CSI score) by 2 wk [k]	2.5	3.3	NS
Mean caregiver strain (CSI score) by 4 wk [k]	2.0	2.8	NS
CN awareness of type of postoperative care patient received, *%*	65	2	<0.001
Information about patient received by CN before surgery, *%*	40	4	<0.001
Information about patient received by CN after surgery, *%*	83	13	<0.001
Mean overall quality of life (AQoL score) by 1 mo [l]	0.2	0.1	0.020
Mean caregiver strain (CSI score) by 1 mo	3	3	NS

Study, year (reference)	Setting (country)	Participants, *n*		Intervention vs. control (classification[a])
		Intervention group	Control group	
Avlund et al, 2002 [53]	Elderly patients admitted to geriatric, subacute geriatric and medical wards (Denmark)	59	90	Comprehensive follow-up home visits vs. usual discharge services (2, 3)
Harrison et al, 2002 [54]	Patients with congestive heart failure admitted to 2 general medical units of a large urban teaching hospital (Canada)	92	100	Hospital-to-home transitional care model vs. usual transfer (2, 3)
Indredavik et al, 2000 [55]	Patients with stroke admitted to a stroke unit (Norway)	160	160	Extended stroke service unit with early supported discharge vs. ordinary stroke unit service without service from mobile stroke team (1, 2, 3)
Nazareth et al, 2001 [56]	Elderly patients with 4 or more medicines discharged from 3 acute general hospitals and 1 long-stay hospital (United Kingdom)	181	181	Pharmacy discharge plan vs. discharge procedures (1, 2, 3)
Rutherford and Burge, 2001 [57]	Patients with cancer admitted for major surgery at an oncology unit (Australia)	50 (invited), 50 (discharge summary)	50 (invited), 50 (discharge summary)	GPs invited to hospital vs. noninvited GPs and special discharge summary vs. routine discharge summary (1, 2, 3)
McInnes et al, 1999 [58]	Elderly patients admitted to geriatric units of a district hospital and a teaching hospital (Australia)	205	159	GP input into discharge planning vs. usual care (1)
Naylor et al, 1999 [59]	Elderly patients with medical and surgical reasons for admission at 2 urban, academically affiliated hospitals (United States)	177	186	APN-centered comprehensive discharge planning and home follow-up (protocol) vs. routine discharge planning (2, 3)

Results			
Outcome[b]	**Intervention group**	**Control group**	***P* value**
Rehospitalizations by 3 mo	NR	NR	NS
Mean functional ability (BI score) by 3 mo (SD)	84.2 (15.6)	82.4 (19.4)	0.020 [m]
Decrease in functional ability (BI score) among patients from medical wards by 3 mo, %	62	89	0.020
Mean quality of life (total MLHFQ score) by 2 wk (SD)	32.4 (19.7)	39.0 (19.5)	NR
Mean quality of life (total MLHFQ score) by 6 wk (SD)	27.3 (19.1)	37.5 (20.3)	0.002
Mean quality of life (total MLHFQ score) by 12 wk (SD)	25.8 (19.4)	38.4 (18.2)	<0.001
Mean quality of life (SF-36) by 2 wk, PCS score (SD)	30.0 (10.2)	28.7 (10.2)	NR
Mean quality of life (SF-36), by 6 wk, PCS score (SD)	30.9 (11.7)	29.4 (11.0)	0.82
Mean quality of life (SF-36), by 12 wk, PCS score (SD)	32.1 (11.8)	28.3 (10.0)	0.070
Mean quality of life (SF-36), by 2 wk, MCS score (SD)	52.3 (12.2)	49.3 (11.9)	NR
Mean quality of life (SF-36), by 6 wk, MCS score (SD)	53.5 (10.5)	49.5 (11.3)	NR
Mean quality of life (SF-36), by 12 wk, MCS score (SD)	53.9 (12.3)	51.0 (11.5)	0.26
Mean quality of life (SF-36), by 2 wk, GHS score (SD)	55.1 (23.8)	52.6 (24.5)	NR
Mean quality of life (SF-36), by 6 wk, GHS score (SD)	56.3 (23.6)	48.5 (22.9)	0.070
Mean quality of life (SF-36), by 12 wk, GHS score (SD)	54.5 (26.9)	49.3 (25.1)	0.43
All-cause ED visits within 12 wk, %	29	46	0.030
Rehospitalizations within 12 wk, %	23	31	0.26
Patient global independence (mRS) by 6 wk, %	54.4	45.6	0.118
Patient ADL independence (BI) by 6 wk, %	56.3	48.8	0.179
Rehospitalizations by 3 mo, %	96	100	NS
Deaths by 3 mo, %	96	100	NS
Outpatient department attendance by 3 mo, %	96	100	NS
GP attendance by 3 mo, %	76	82	NS
Days in hospital as % of days of follow-up by 3 mo	0	0	NS
Mean general patient well-being by 3 mo (SD) [n]	2.4 (0.7)	2.4 (0.6)	NS
Mean patient satisfaction by 3 mo (SD) [o]	3.3 (0.6)	3.3 (0.6)	NS
Mean patient adherence to medicines by 3 mo (SD) [p]	0.8 (0.3)	0.8 (0.3)	NS
Mean patient knowledge about medicines by 3 mo (SD) [p]	0.7 (0.3)	0.6 (0.3)	NS
Mean patient hoarding of medicines by 3 mo (SD) [p]	0.006 (0.04)	0.005 (0.03)	NS
GP hospital visits (reported by GPs) by 4 to 6 wk, %	29	4.7	<0.001
GP hospital visits (reported by patients) by 4 to 6 wk, %	23	2	<0.001
GP-reported telephone calls from GP to hospital by 4 to 6 wk, %	79	30.1	<0.001
Patient-reported telephone calls from GP to hospital by 4 to 6 wk, %	47	12	<0.001
Patient satisfaction with GP management of postdischarge problems by 4 to 6 wk	NR	NR	NS
Patient confidence in GP management of future problems by 4 to 6 wk	NR	NR	NS
GP confidence in management of patients' future problems by 4 to 6 wk	NR	NR	NS
Patient satisfaction with discharge planning by 6 wk, %	93	82	0.030
Patients recommended for support services (in community setting) at discharge, %	12	19	0.030
Rehospitalizations within 6 wk	17	47	<0.001

Study, year (reference)	Setting (country)	Participants, *n*		Intervention vs. control (classification[a])
		Intervention group	Control group	
van Walraven et al, 1999 [60]	Patients discharged from a general internal medicine service at a tertiary care teaching hospital (Canada)	142	151	Database-generated discharge summaries vs. dictated discharge summaries (1, 3)
Siu et al, 1996 [61]	Elderly patients admitted to the medical and surgical services of a hospital (United States)	178	176	Postdischarge geriatric assessment vs. routine medical discharge care (1, 2, 3)
Rich et al, 1993 [62]	Elderly patients with congestive heart failure admitted to the medical ward of a secondary and tertiary care university teaching hospital (United States)	40 (moderate-risk patients), 23 (high-risk patients)	21 (moderate-risk patients), 14 (high-risk patients)	Comprehensive multidisciplinary treatment strategy vs. conventional discharge treatment (1, 2, 3)

ADL = activities of daily living; APN = advanced practice nurse; AQoL = Assessment of Quality of Life; BI = Barthel Index; CN = community nurse; CSI = Caregiver Strain Index; DCS = Discharge Composite Score; ED = emergency department; FACT-B = Functional Assessment of Cancer Therapy-Breast; GHS = General Health Subscale; GP = general practitioner; HDS = Hospital Discharge Survey; HP = hospital physician; MAI = Medication Appropriateness Index; MCS = Mental Component Summary; MLHFQ = Minnesota Living with Heart Failure Questionnaire; mRS = modified Rankin Scale; NC = not calculable; NR = not reported; NS = nonstatistically significant (no P value reported); PCS = Physical Component Summary; SF-12 = Short Form-12; SF-36 = Short Form-36; SIMS = Satisfaction with Information about Medicines Scale; SS = statistically significant (no P value reported).

[a] Intervention 1 consists of components that aim to improve the quality of information that is exchanged (e.g., completeness, clarity, and accuracy of information). Intervention 2 consists of components that aim to improve the coordination of care (e.g., assessment, planning, and organization of follow-up services and needs). Intervention 3 consists of components that aim to improve communication (e.g., personal and direct contact, accessibility, and timeliness of information).

[b] Outcome measures within 3 mo after discharge and relevant for identifying the effect of intervention on handover between hospital and primary care providers.

[c] Delivery of discharge summary by e-mail and fax was significantly more effective than post and patient hand delivery ($P < 0.001$).

[d] Measured with the Brief Medication Questionnaire Regimen Screen (score ≥ 1 indicates that patient is potentially nonadherent).

[e] Rated on a visual analogue scale of 0 to 100.

[f] Measured with the Modified Morisky Scale for self-reported adherence (lower score indicates better adherence).

[g] Measured with a Web-based questionnaire for GPs with transformed dichotomous outcomes.

[h] Rated on a 5-point Likert scale.

[i] Measured with an investigator-developed and -tested instrument with 25 items self-rated on a point scale of 0 to 4 and a range of 44 to 100 (higher scores reflect greater satisfaction).

[j] Interpreted from Figure (scale of 100 to 130).

[k] Interpreted from Figure (scale of 0.0 to 5.0).

[l] Interpreted from Figure (scale of −0.10 to 0.25).

[m] Difference in BI score only statistically significant for patients from the medical wards.

[n] Measured with a British adaption of the general well-being questionnaire (22 items scored from 1 to 5).

[o] Measured with a client satisfaction questionnaire (7 items scored from 1 to 4).

[p] Validated self-report semistructured interview rated from 0 (none) to 1 (total/highest level).

[q] GPs' assessments of discharge summaries rated on visual analogue scale of 0 to 100.

Results			
Outcome[b]	**Intervention group**	**Control group**	***P* value**
Completed summaries by 4 wk, %	79.6	57.0	<0.001
Mean overall summary quality (SD)[q]	72.7 (19.3)	74.9 (16.6)	NR
Mean overall completeness summaries (SD)[q]	73.4 (19.8)	78.2 (14.9)	NR
Mean overall organization summaries (SD)[q]	77.4 (16.3)	79.3 (17.2)	NR
Mean overall timeliness summaries (SD)[q]	70.3 (21.9)	66.2 (25.6)	NR
Rehospitalizations by 60 d after randomization, *n*	43	37	0.40
Death by 60 d after randomization, *n*	7	8	NR
Overall rehospitalization within 90 d, %	33.3	45.7	NS
Rehospitalization rates (moderate-risk patients) by 90 d, %	27.5	47.6	0.100
Rehospitalization rates (high-risk patients) by 90 d, %	43.5	42.9	NS
Mean overall total days to first rehospitalization within 90 d (SD)	31.8 (5.1)	42.1 (7.3)	NS
Mean overall total days to first rehospitalization (moderate-risk patients) within 90 d (SD)	35.1 (9.0)	28.6 (7.2)	NR
Mean overall total days to first rehospitalization (high-risk patients) within 90 d (SD)	27.8 (3.5)	60.2(10.5)	0.026

Chapter 7

Developing a customized hospital discharge intervention program using the Intervention Mapping framework

Gijs Hesselink
Marieke Zegers
Myrra Vernooij-Dassen
Paul Barach
Cor Kalkman
Maria Flink
Gunnar Öhlén
Mariann Olsson
Susanne Bergenbrant
Carola Orrego
Rosa Suñol
Giulio Toccafondi
Francesco Venneri
Ewa Dudzik-Urbaniak
Basia Kutryba
Lisette Schoonhoven
Hub Wollersheim

Submitted.

ABSTRACT

Background: Ineffective patient handovers at hospital discharge may lead to patient harm, increased readmissions and costs. The aim of this study was to develop an intervention plan to improve patient handovers from the hospital to primary care, based on theoretical, empirical and practical information by using the six-step Intervention Mapping framework.

Methods: First, a problem analysis studying the scale, causes, and consequences of ineffective hospital discharge was carried out. The analysis was based on primary data from 26 focus group interviews and 321 individual interviews with patients and relatives, hospital physicians, hospital nurses, general practitioners (GPs) and community nurses. Second, we specified what could be improved in terms of intervention outcomes, performance objectives and change objectives. Third, 220 experts were consulted and a systematic review of effective discharge interventions was carried out to select theory-based methods of change and practical strategies to achieve the set objectives. Suggestions were then made for developing, implementing and evaluating the intervention program in steps four to six.

Results: Interventions should be aimed at different factors related to ineffective discharge: the individual care provider, the patient, the relationship between providers, and the organizational and technical support for care providers. Overall desired intervention outcomes are: a reduction of hospital readmission rates and adverse events. To achieve this, healthcare providers should aim for high-quality of discharge information, well-coordinated care, and direct and timely communication with their counterpart colleagues. Patients, if capable, should participate in the discharge process and be well aware of their health status and treatment. A variety of change objectives were formulated to realize these performance objectives (e.g., hospital physicians and nurses checking if discharge information is accurate and understood by patients at discharge). Theory-based methods (e.g., consciousness raising and guided practice), and effective and promising strategies (e.g., standard discharge templates, discharge planning reminders, medication reconciliation and teach-back) aimed at changing the important determinants were identified.

Conclusion: The findings of this study serve as a rationale for improving hospital discharge by developing evidence-based intervention programs customized to local settings.

BACKGROUND

A shorter length of hospital stay, the decrease in work-hours of health care providers, and the increasing number of transitions of patients between departments and institutions puts a premium on the quality of patient handovers, especially those of frail and high-risk patients with co-morbidities[1]. Continuity of care at patient discharge from the hospital is a critical aspect of reliable and high quality patient care[2,3]. Highly reliable care requires close cooperation between care providers across organizational boundaries, thereby establishing an interdisciplinary network[4]. Unfortunately, incomplete or incorrect information and communication errors between the hospital care providers and the multiple receiving parties (e.g., patients, informal caregivers, general practitioners, community pharmacists, nursing home physicians, social service workers) often increase the chance of adverse events for patients that ultimately may lead to life threatening situations, avoidable treatments, unplanned re-hospitalizations[5,6], and extra costs[7-9].

Recent studies have identified discharge problems in the social, organizational, linguistic and technical context[10-12]. However, there is insufficient, evidence-based insight into possible solutions to these problems. Although many different interventions have been developed to improve patient handover from the hospital to primary care, the effectiveness of most interventions is highly variable and limited in daily practice. Explanations for these disappointing results include the difficulty of changing existing practice, non-optimal choices of intervention strategies, inadequate resources devoted to evaluating the impact of interventions, and the use of inadequate methods to design and evaluate interventions[13-15]. A systematic approach for translating discharge problems into customized solutions is lacking. Many clinical intervention developers select their strategies intuitively. However, effective interventions need to be theory- and evidence based, and targeted at specific behavioral and environmental factors that determine healthcare performance[16,17].

The aim of our study was to develop a systematic and comprehensive intervention plan, by using the Intervention Mapping (IM) framework, to improve patient handovers from the hospital to primary care and reduce patient readmissions[18].

METHODS

IM is a systematic, iterative six-step process to develop an intervention program, based on theoretical, empirical and practical information[18]. The steps are summarized in table 1. IM was originally used in the health promotion domain to develop programs for smoking cessatation[19], stroke prevention[20], asthma management[21], HIV prevention[22], and leg ulcer management[23]. We modified the IM terminology in order to apply it to the quality improvement domain.

This paper focuses on steps 1 to 4, the development phase of an intervention program. We provide suggestions for further implementing and evaluating the intervention program (steps 5 and 6).

Table 1. Intervention mapping steps, objectives and methods*

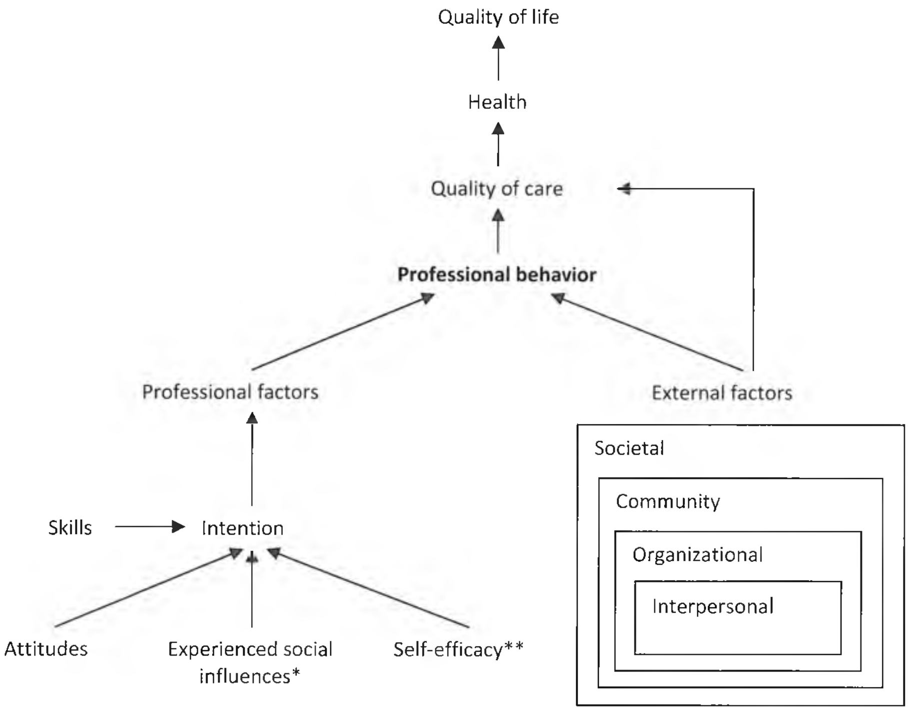
Steps	Objectives	Methods
1. **Problem analysis**	▪ Gain insight into health problem, quality of care, underlying causes and target population	▪ Problem analysis using PRECEDE-PROCEED model; ▪ Analysis based on: - Literature research - Individual interviews - Focus group interviews - Process mapping - Artifact analysis - Ishikawa (fishbone) diagram
2. **Identify intervention outcomes, performance objectives and change objectives**	▪ State intervention outcomes ▪ Specify performance objectives ▪ Select important and changeable determinants ▪ Develop matrices with change objectives based on performance objectives and determinants of suboptimal hospital discharge	▪ Use evidence from literature and empirical data from problem analysis (step 1) ▪ Input from experts in the field of patient handover (healthcare providers, and organizational, social and health scientists)
3. **Select theory-based methods and practical strategies**	▪ Identify and select theoretical methods ▪ Select evidence-based interventions and design of practical strategies ▪ Ensure that interventions and applications address change objectives	▪ Literature search on theory-based methods ▪ Input from experts ▪ Systematic literature review on evidence based discharge interventions ▪ Additional search for experience based practical strategies ▪ Matching methods and practical strategies with determinants and performance objectives (step 1 and 2)
4. **Develop an intervention program**	▪ Provide suggestions for developing an intervention program	▪ Input from literature search and experts
5. **Implementation**	▪ Provide suggestions for writing an implementation plan	▪ Literature search of implementation strategies and tools
6. **Evaluation**	▪ Provide suggestions for writing an evaluation plan	▪ Literature search on methods for effect and process evaluation on complex interventions

* Adapted from Bartholomew et al[18].

Step 1: Problem analysis

We structured the problem analysis by using the PRECEDE-PROCEED model[24] (see figure 1) to analyze and describe the scale, causes, and consequences of the health problem and to identify the target population of the intervention program.

Figure 1. **Modified model based on the PRECEDE-PROCEED concept and the theory of planned behavior**[16]



* Subjectively perceived social influences (as opposed to interpersonal external factors, which are objective social influences).

** Trust in own capacities to perform according to standards of good care.

Procedure and participants

A literature search on the frequency and consequences of ineffective hospital discharge problems was performed to gain insight into the health problem[25]. We performed a large prospective, qualitative study on patient handovers between hospital and primary care in five countries, i.e. The Netherlands, Spain, Poland, Sweden, and Italy, to identify and assess the behavioral and environmental determinants influencing ineffective hospital discharge[10-12]. Data collection and analysis consisted of multi-method qualitative research including: 321 individual (93 patients and/or relatives, 150 hospital care providers and 78 primary care providers) and 26 focus group interviews (n=156) analyzed using Grounded Theory[26], five process maps, five artifact analyses[10-12], and five Ishikawa (fishbone) diagrams[27]. The discharged patients were recruited based on general and country-specific inclusion criteria (see table 2). The ethics approval was received in each of the five study sites and patients were asked for informed consent.

Table 2. Study population inclusion and exclusion criteria

Inclusion	
Patients	18 years old+ Admitted to internal medicine, pulmonary, cardiology or (vascular) surgical wards Any of the following diagnoses: diabetes mellitus, asthma, COPD, chronic heart failure Prescribed 6+ drugs Recruited consecutively at the point of their hospital discharge Discharged to the community (i.e. home or nursing home)
Hospital physicians and nurses	Internal medicine, pulmonary diseases, cardiology or (vascular) surgical wards
GPs and community nurses	Representing the communities to which the patients were discharged
Exclusion	
Patients referred to other care units within the hospital prior to their discharge home or discharge to another country.	

Step 2: Identify intervention outcomes, performance objectives and change objectives

In step 2, we first identified the overall desired outcomes of the intervention and formulated specific performance objectives for the target population (e.g., the behavioral steps to be performed by the hospital physician, such as writing a complete, accurate and timely discharge letter). This was a step by step checklist of what needs to occur in order to obtain the desired outcomes[28].

Finally, it is important to identify what steps need to be tweaked in order to affect the performance objective, and ultimately the intervention outcome[28]. We identified the most important determinants (e.g., lack of knowledge and understanding between hospital and primary care providers) that need to be changed and combined these with performance objectives to formulate change objectives. These change objectives specified who and what will change as a result of the intervention. The output of this process are matrices of change objectives[18].

Procedure and participants

A literature search of the desired outcomes of the intervention was conducted[25]. The performance objectives and matrices of change objectives were discussed in a multidisciplinary study panel that included experts in health-, social- and organizational sciences. A selection of most important determinants was made because it would be impossible to investigate all the determinants that were identified in the problem analysis (step 1). In a survey members of the European HANDOVER Research Collaborative (n=15 experts in the field of handover and health care providers) scored the large number of determinants on importance on a 5-point Likert scale.

Step 3: Selection of theory-based methods and practical applications

We selected theoretical methods based on the change objectives in step 2. These methods were required to change the behavioral and environmental determinants of ineffective hospital discharge. Subsequently, these methods were translated into practical strategies.

Procedure and participants

Theoretical methods were identified from our literature search, and guided by an overview of theory-based change principles by Bartholemew et al.[18], Achterberg et al.[19], and Grol et al.[30]. A total of 220 international researchers, policy-makers and regulators in the field of quality and safety in healthcare, healthcare providers and patient representatives were consulted about their experiences with successful strategies or promising ideas in three expert meetings in 2010-2011[31]. A systematic review of randomized controlled trials (RCTs) of the effects of discharge interventions, provided an overview of evidence-based strategies[32]. An additional literature search was performed to identify promising strategies that were not included in the systematic review (e.g., evaluated with a weaker study design than RCTs) or not evaluated yet (e.g., local initiatives). The strategies were selected by the study panel after 11 discussion sessions based on the findings from the systematic review, the experiences of the experts and the additional literature search.

Step 4: Develop an intervention program

In this step, we provide suggestions for the design of the intervention program by considering the target group and local setting[18].

Procedure and participants

The effectiveness of an intervention is an important factor for selecting an intervention. The intervention studies identified in step 3 were classified independently by two researchers (GH and MZ) according to the Oxford Centre for Evidence-Based Medicine - Levels of Evidence from 2009 onward[33].

Steps 5 and 6: Implementation and Evaluation

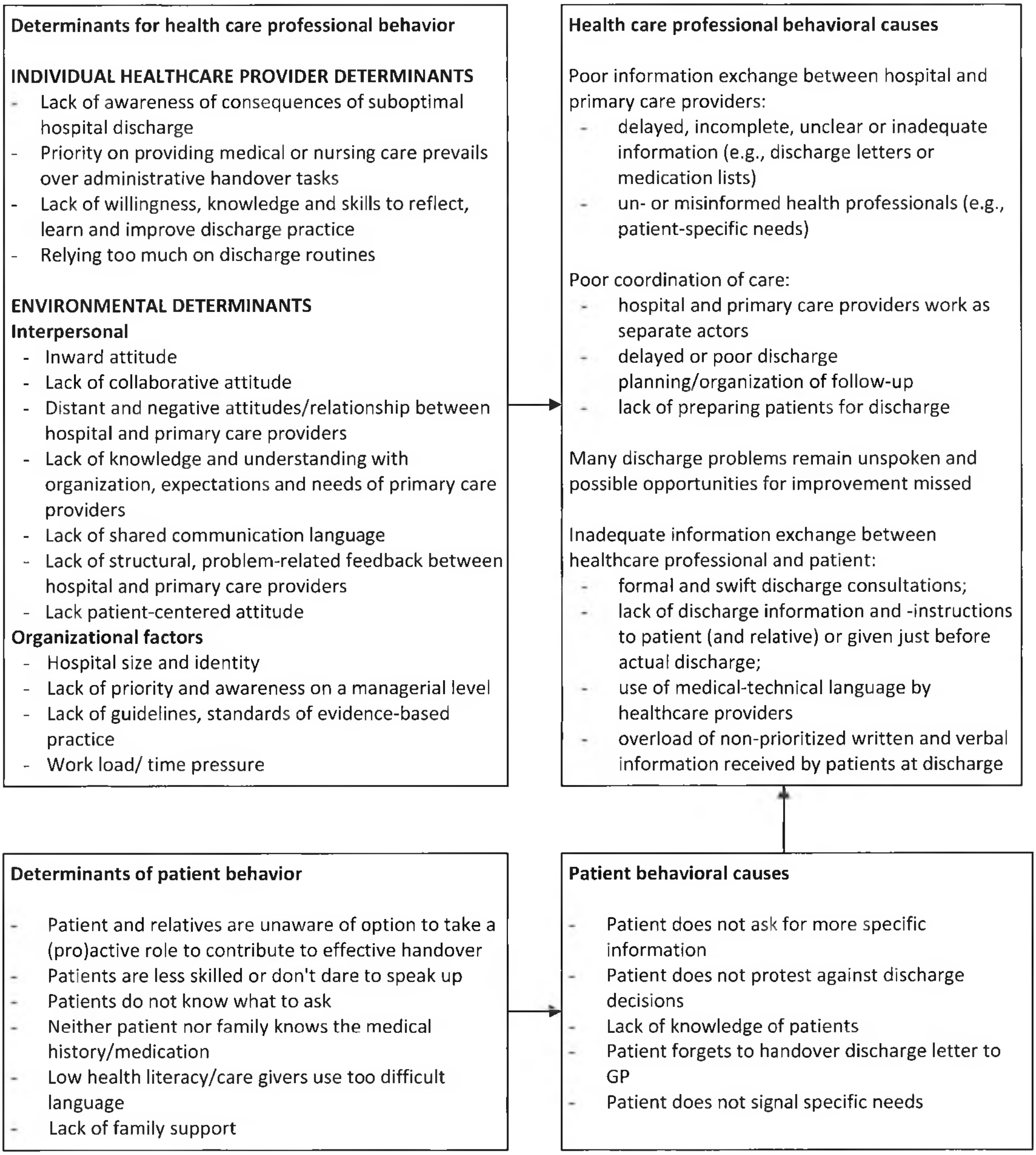
A robust implementation process is vital to ensure program success. We made suggestions for developing an implementation plan for accomplishing program adoption and suggestions to create a plan for evaluating the effects and feasibility of the intervention program. The suggestions were based on literature regarding effective implementation strategies[17,30,34-36], existing implementation toolboxes[37,38], and a literature review on methods to evaluate complex interventions in health care[35,39,40].

RESULTS

Step 1: Problem analysis

The health problem and the underlying causes are presented in figure 2. Published studies show that one in five patients experience an adverse event following hospital discharge, of which one in three is considered preventable[41]. Three percent of the adverse events lead to permanent disability, including death.

Figure 2. Model of suboptimal hospital discharge: overview of the health problem, causes and their determinants



Determinants for health care professional behavior

INDIVIDUAL HEALTHCARE PROVIDER DETERMINANTS
- Lack of awareness of consequences of suboptimal hospital discharge
- Priority on providing medical or nursing care prevails over administrative handover tasks
- Lack of willingness, knowledge and skills to reflect, learn and improve discharge practice
- Relying too much on discharge routines

ENVIRONMENTAL DETERMINANTS
Interpersonal
- Inward attitude
- Lack of collaborative attitude
- Distant and negative attitudes/relationship between hospital and primary care providers
- Lack of knowledge and understanding with organization, expectations and needs of primary care providers
- Lack of shared communication language
- Lack of structural, problem-related feedback between hospital and primary care providers
- Lack patient-centered attitude

Organizational factors
- Hospital size and identity
- Lack of priority and awareness on a managerial level
- Lack of guidelines, standards of evidence-based practice
- Work load/ time pressure

Health care professional behavioral causes

Poor information exchange between hospital and primary care providers:
- delayed, incomplete, unclear or inadequate information (e.g., discharge letters or medication lists)
- un- or misinformed health professionals (e.g., patient-specific needs)

Poor coordination of care:
- hospital and primary care providers work as separate actors
- delayed or poor discharge planning/organization of follow-up
- lack of preparing patients for discharge

Many discharge problems remain unspoken and possible opportunities for improvement missed

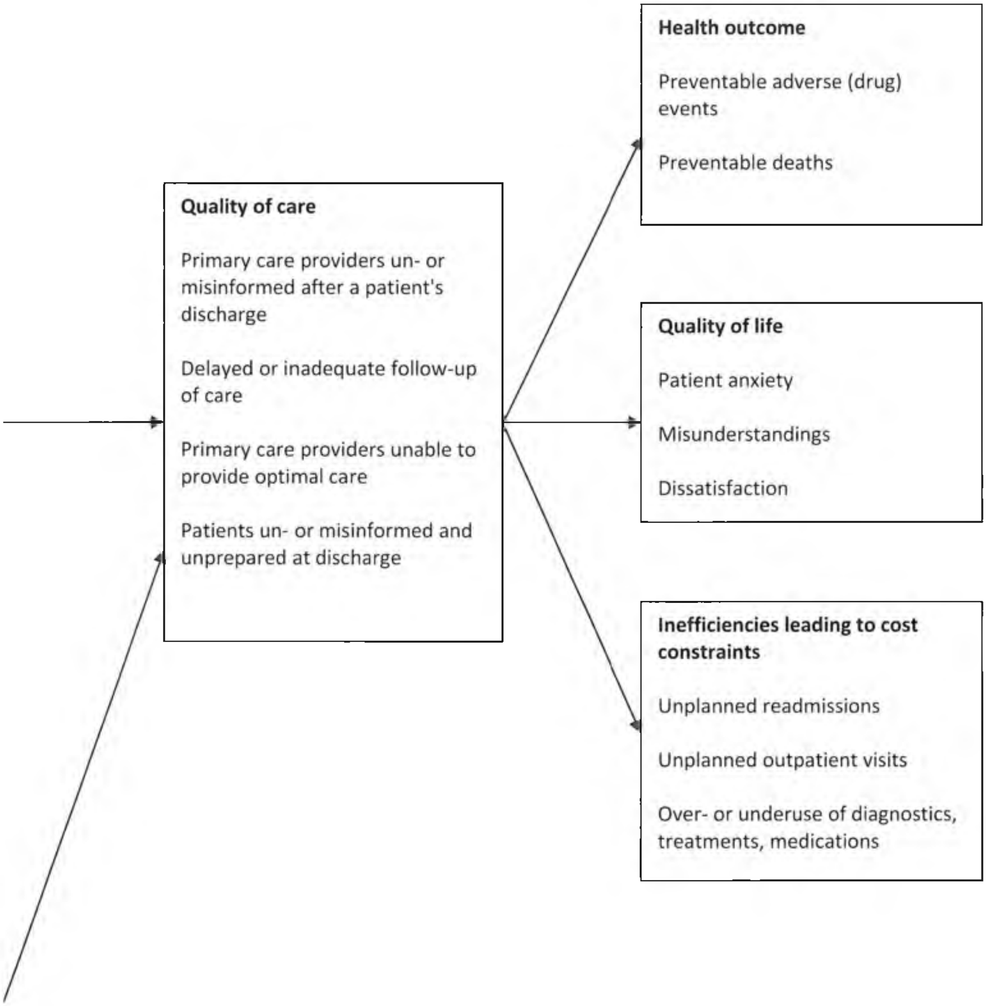
Inadequate information exchange between healthcare professional and patient:
- formal and swift discharge consultations;
- lack of discharge information and -instructions to patient (and relative) or given just before actual discharge;
- use of medical-technical language by healthcare providers
- overload of non-prioritized written and verbal information received by patients at discharge

Determinants of patient behavior

- Patient and relatives are unaware of option to take a (pro)active role to contribute to effective handover
- Patients are less skilled or don't dare to speak up
- Patients do not know what to ask
- Neither patient nor family knows the medical history/medication
- Low health literacy/care givers use too difficult language
- Lack of family support

Patient behavioral causes

- Patient does not ask for more specific information
- Patient does not protest against discharge decisions
- Lack of knowledge of patients
- Patient forgets to handover discharge letter to GP
- Patient does not signal specific needs


Quality of care
Primary care providers un- or misinformed after a patient's discharge
Delayed or inadequate follow-up of care
Primary care providers unable to provide optimal care
Patients un- or misinformed and unprepared at discharge
Health outcome
Preventable adverse (drug) events
Preventable deaths
Quality of life
Patient anxiety
Misunderstandings
Dissatisfaction
Inefficiencies leading to cost constraints
Unplanned readmissions
Unplanned outpatient visits
Over- or underuse of diagnostics, treatments, medications

The one month unplanned readmission rates varied between 13%[42] and 20%[43]. In around 15% of cases of readmission, this was due to failure in handover and thus preventable. Unnecessary hospital readmissions lead to a considerable suffering and extra costs. Hospital cost for preventable readmissions during 6 months was estimated at about $730 million[7], and $44 billion per year for rehospitalizations within 30 days of hospital discharge[44].

We found that ineffective handovers that led to patient readmissions are caused by poor information exchange, poor coordination of care and poor communication between hospital and primary care providers, and between care providers and patients. The underlying causes include attitudinal and behavioral factors (e.g., lack of understanding of the needs of the counterpart, a distant relationship and a lack of collaborative attitude between hospital and primary care providers), organizational factors (e.g., lack of guidelines), technical factors (lack of a shared electronic information system) or patient factors (e.g., patients are less skilled or don't dare to speak up)[10-12]. All identified causes and their underlying factors are summarized in figure 2.

Step 2: Matrices of change objectives

Intervention outcomes

Two outcome measures were selected in step 1 as measurable and feasible endpoints for an evaluation study: hospital readmission rates and adverse events rates after the hospital discharge.

Performance objectives

All performance objectives are listed in table 3. The performance objectives of the healthcare providers related to exchanging *high-quality discharge information* to primary care providers and patients. For example, discharge letters that are complete (i.e., no redundant/irrelevant or missed information), accurate and understandable (i.e., structured presentation of information, explanation of abbreviations jargon), and patients being informed at discharge in plain language. Regarding *coordination of care*, healthcare providers were expected to have organized and accurate follow-up services at patient's discharge in a timely manner and tailored to the patient's preferences and psychosocial needs (e.g., assessment of home setting, social risks and support). Examples of performance objectives for *discharge communication* are hospital care providers being accessible for primary care providers or patients and exchanging discharge information in time to support primary care providers or patients.

Patients are, if capable, expected to contribute to the continuity of care by *participating in the discharge process* (e.g., by handing over a discharge letter to their GP after being discharged), and by being *well aware about their health status* (e.g., medical and medication history) *and treatment plan*.

Table 3. Performance objectives for healthcare providers and patients

Healthcare providers		
Discharge information	1a.	Complete discharge information
	1b.	Clear discharge information
	1c.	Accurate discharge information
Coordination of care	2a.	Ensure that follow-up services are being organized at actual discharge
	2b.	Tailor follow-up care to patient needs and preferences
	2c.	Organize timely and accurate follow-up
Discharge communication	3a.	Seek direct/personal contact with primary care counterpart
	3b.	Discharge information easily accessible to counterpart care providers and patients (and relatives)
	3c.	Exchange discharge information on time to primary care counterparts
	3d.	Inform patient (and relatives) personally and in timely manner
Patients		
Participation in discharge process	4.	Contribute, if capable, to the continuity of care in the discharge process
Awareness of health status and treatment	5.	Well aware about medical history and medication use, diagnosis/indication and (side) effects of the treatment

Selected determinants and change objectives

The most important determinants (as perceived by experts in the field of patient handovers and described in step 2 of the methods) were classified according to the individual professional, interpersonal, organizational, technical and patient levels. Combining the performance objectives with the selected determinants resulted in two matrices with change objectives for healthcare providers and patients, which were the specific targets for the intervention. The matrices are presented in table 4.

Table 4. Matrices of change objectives

					CARE PROVIDER BEHAVIOR,
DTs	**Individual care provider**		**Interpersonal**		
POs	*Unawareness of consequences of suboptimal hospital discharge*	*Priority on care prevails over administrative handover tasks*	*Hospital-based care providers' inward focus*	*Lack of a collaborative attitude*	*Lack of knowledge/ understanding of PC expectations and needs*
Discharge information	Explain and discuss the potential consequences of a incomplete, unclear, inaccurate DL Recognize the need for a clearly written DL and ML	Appraise writing DLs as essential part of providing care Plan sufficient time to write DLs	Recognize the importance of sharing information and to make it easy available for PC providers after discharge	Provide verbal explanation of discharge information to PC counterpart when needed	Recognize if information is sufficient and understandable for the PC counterpart Identify what information is needed to handover care
Coordination of care	Explain and discuss the potential consequences of improper assessment of follow-up needs	Recognize the need to take time to assess follow-up needs of patients Plan sufficient time to organize follow-up services Recognize the need to plan discharge and organize follow-up services in time	Monitor discharged patients in the community	Arrange a meeting with PC counterpart to discuss patient follow-up needs Allocate tasks and responsibilities clearly between hospital and PC PC providers review information of hospital counterparts seriously	Recognize and value the PC organization, needs and capabilities Recognize available follow-up services (e.g. support, medication)
Discharge communication	Explain and discuss the potential consequences of a delayed DL	Recognizing the moment when a DL really needs to be sent away in order to continue care in the community Plan sufficient time to write DLs	Recognize the importance of being accessible to counterpart Alert PC providers on nearing patient discharge	Recognize that personal/direct contact between a hospital and PC provider about a patient's discharge can be beneficial for an adequate and timely follow-up of care	Inform counterpart what time is most appropriate to be called Define situations when hospital care provider needs to take the initiative to call the PC counterpart and vice versa

ORGANIZATIONAL AND TECHNICAL CONTEXT					
Interpersonal		**Organizational**			**Technical**
Lack of structural, problem-related feedback	*Patient-centered attitude*	*Lack of EB guidelines/ standards*	*Work shift structure of hospital personnel*	*Poor accessibility of hospital care providers*	*Lack of shared IT system*
Provide and value feedback when discharge information is not handed over complete, in time, clear and/or accurate	Check if patients received all information they needed/preferred Recall if patients understood the received information Identify ways to inform patients about discharge and follow-up in an understandable way	Standardize discharge information structure and content Check if exchanged information is correct (no duplications/ variations)	Recognize who/when is first responsible for a patient's discharge Describe what discharge information is already written down and what still needs to be done		
Provide and value feedback when follow-up is not clear enough or does not meet the needs and preferences of PC providers and patients	Inspect patient specific follow-up needs and wishes Arrange shared-decision making of follow-up needs between care providers and with patient/relative	Standardize DP and organization of follow-up services	Organize a constant group of care providers around the patient nearing discharge Assign one person responsible for coordinating discharge Describe follow-up that is organized and what needs to be done		Share patient information of all involved health care providers in one database
Provide and value structural feedback when counterpart is hard to reach	Make care providers better reachable for discharged patients Recognize the need to inform the patient/ relative personally and on time Schedule time for informing patient about discharge and follow-up	Standardize communication between different healthcare providers Check if counterpart understood the information (recall)	Assign one person who coordinates discharge communication between hospital and PC providers	Improve the organizational means to make care providers better reachable for the counterpart during or after patient hospitalization	Provide access to patient information for hospital and PC providers at any time

	PATIENT
POs	**DTs Unawareness of important role in the discharge process**
Participation in discharge process	Recognize that they can contribute to an effective hospital discharge Handing over the DL to responsible PC provider Carrying an up–to-date medication list
Awareness of health status and treatment	Recognize the need to learn about medical history, medication use, diagnosis and (side) effects of treatment

DL=discharge letter; DP=discharge planning; DT=determinants; ML=medication list; PC=primary care; PO=performance objectives.

Step 3: Selecting methods and practical applications

Theory-based change methods were identified to influence the behavioral and environmental determinants of ineffective hospital discharge. These methods were subsequently operationalized into practical strategies, and corresponding activities and materials for the targeted population. Table 5 gives an overview of the methods and applications. Examples of theory-based methods are listed below.

From the Social Cognitive Theory (SCT)[45], we used *knowledge transfer*, *active learning* and *guided practice* as main methods to provide care providers and patients with sufficient (scientific) knowledge and adequate skills and expectations to continue care after discharge. We selected *standardized working processes* derived from the SCT and Rational Decision-making theories[30], based on the need to support healthcare providers with more effective ways of decision making. The construct of *consciousness raising* from the Transtheoretical Model[46,47], *shifting perspectives* and *interpersonal contact* from the Intergroup Contact Theory[48] were used to influence the understanding between hospital and primary care providers and to facilitate handover collaboration.

From theories of Goal Directed Behavior[49], we applied the method of *goal-setting* and *implementation intentions* in which participants specify goals and plan the steps for carrying out their goals to increase the likelihood of goal attainment. These methods have lead to better performance, because people with explicit goals exert themselves to a greater extent and persevere in their tasks[50].

Changing handover behaviors of care providers, patients, and relatives should also take place by demonstration and through reinforcement by others[30]. From the Trans-Theoretical Model we respectively used *modeling* and *reinforcement* through feedback and stimulus control (e.g., reminders and cues) for encouraging the desired behavior.

AND RELATIVE	
Lack of skills and dare to speak up	**Lack of understanding of medical history and/ or medication**
Signal specific needs and preferences at hospital discharge	Identify possible side effects and indications that health condition is worsening and know how to respond
Ask questions concerning hospitalization, discharge and follow-up care	Health care providers inform patients and check if patients understood the received information
Ask for more explanation/clarification if felt needed	

Furthermore, we used *multi-disciplinary collaboration* and *case management* from theories of Integrated Care[51], to improve attitudes towards handover collaboration and the coordination of care in the hospital and primary care interface.

Step 4: Develop an intervention program

A wide variety of change objectives at the individual clinician and patient levels, the interpersonal level, organizational and technical levels (table 4) need to be considered in order to tackle ineffective handovers at discharge more reliably. The intervention program likely needs to be multi-faceted and needs to be tailored to the needs encountered in the local setting. Table 5 is an intervention toolbox with strategies and related materials and activities for healthcare providers and policy makers, to develop a discharge intervention program.

Many interventions were evaluated in well-designed studies. For example, standardized discharge practices such as the use of discharge letter templates, discharge planning guidelines and medication reconciliation checklists are effective strategies to reduce intuitive and suboptimal decision-making by care providers[56,92,93,95,98]. The use of a shared electronic patient information platform facilitates discharge communication between hospital and primary care providers[95,99,102,103]. Furthermore, there is evidence demonstrating that the patient's role in the discharge process is enhanced by the provision of written and verbal discharge information and by assistance and guidance in self-management (e.g., discharge counseling, follow-up calls or home-based visits and a patient discharge record or question form)[63,106,109]. However, many promising interventions have not been evaluated properly or at all or were tested with weak study designs. For example, the effects of a medical or nursing internship program (both at the hospital and primary care setting), lectures and exercises on discharge practice in the medical curriculum, and regular group discussions involving hospital and primary care providers are largely unknown[52]. There is also little knowledge about the effects of reinforcement by using discharge planning reminders, mandatory administrative tasks or financial penalties[55]. Insight is lacking into the effects of strategies to increase care provider reflections on discharge practices (e.g., use of a standardized feedback form, video reflection, role play or simulation of discharge consultations)[52]. Finally, evidence is scarce regarding the use of teach-back as a method to check the patient's understanding of their medical and medication history at discharge[84,85].

Steps 5 and 6: Implement and evaluate

Commitment from and ownership by the target group is essential to successful implementation[112-113]. The awareness among end users is enhanced when they are directly involved in the development or modification of the innovation, in mounting the implementation plan, and in selecting the implementation strategies to be used[35]. Moreover, uptake in policies and protocols, reimbursement and the consideration of patients' preferences are necessary for a sustainable implementation[114].

Strategies that address the barriers to change are required to implement interventions in daily practice[36]. Examples of effective strategies are sending printed instructions by post or giving financial rewards. Most theories on implementation of innovations in health care emphasize that an analysis of the barriers to change practice is a prerequisite to selecting or developing an effective implementation strategy[17].

An implementation plan should be developed specifically after selecting the implementation strategies to tackle the identified barriers. This plan should be compatible with the target group and settings in which the implementation will take place. Good management and planning of implementation activities (i.e., what, when, where, how and by whom?) also appears to be a requisite for successful implementation of innovations in patient care[35].

To evaluate whether the intervention led to the desired degree of change, formative and summative effect evaluation should be carried out using hospital readmission and adverse events as defined patient outcome effects. The formulated performance objectives in step 2 can be operationalized in measurable process indicators, for example by assessing the proportion of patients discharged with a complete discharge letter and assessing the proportion of patients discharged after medication reconciliation.

A process evaluation should be performed to understand the effect, success or failure of the intervention program and to get an impression of its feasibility, generalizability and its acceptability in the target population. Process evaluation gives insight into the black box of the implementation process and can explain the variation in results in evaluating interventions. The activities carried out as part of the intervention, the actual exposure of participants to these activities, and their experience of these activities should be studied[40].

Determinants and change objectives	Theory-based methods	Strategy/ Practical applications	Activities and mate
Individual healthcare provider			
Aware of the consequences of suboptimal hospital discharge	Knowledge transfer/Active learning	Education in the medical and nursing curriculum	Lectures on patient workbook and onlin communication skil requirements)
			Introductory didact knowledge regardi
			Groups of students discuss clerkship ex learned from the in
	Active learning/ Consciousness raising	Storytelling	Group sessions in w providers tell about professionals or stu supervision what co
		Root-cause analysis	Group sessions with professionals or stu with adverse outco own practice/institu
Perceive handover administrative tasks as important part of patient discharge care and act accordingly	Stimulus control/ Reinforcement	Visual electronic reminders	Red, orange and gre discharge letter and deadline for sendin
		Mandatory administrative tasks	Mandatory (digital) letter (before decla reimbursement)
		Punishment	Yearly financial pen specific department
	Goal setting/ Implementation intentions	Early discharge plan with pre-discharge assessment and planning of resources, needs and alternatives	Create discharge pl date, follow-up nee appointments and r
Interpersonal			
Outward focus by hospital-based care providers to ensure continuity of care after discharge	Integrated care	Post-discharge monitoring of follow-up	Standard post-disch visit to the patient t additional instructio questions

Determinants and change objectives	Theory-based methods	Strategy/ Practical applications	Activities and materials
	Consciousness raising/ Goal setting	Visual discharge planning	Information boards above the patie at the nurses' station using colored denote discharge status, and updat discussed by responsible care provi
Hospital and primary care provider collaborative during the discharge process	Integrated care/ Intergroup contact/ Case management	Case conference	Hospital or community-based face- telephone meetings between hospi primary care providers
		Communication hotline	Mobile phone or pager and docume phone numbers of counterpart care the region
		Communication agreements	Calling hours and criteria for wheth communicate by electronic or posta telephone
		Liaison person	A designated care provider coordin hospital discharge and follow-up ca communication between hospital a care
		Allocation of tasks and responsibilities	Bilateral agreement on paper or dis face-to-face or telephone meetings
	Stimulus control	Hospital-based primary contact person	Telephone outreach to primary care notify a primary contact person for consult if needed
		Convincing primary care provider on follow-up care recommendations	Provide medical or nursing literatur subscribed treatment along with th letter to primary care providers
Knowledge and understanding of the primary care organization, expectations and needs	Case management	Case manager with expertise in the field of hospital and primary care coordinates hospital discharge and follow-up care	Advanced nurse or pharmacist coor
	Team building/ Intergroup contact/ Shifting perspective	Meetings between hospital and primary care providers aimed at increasing the mutual understanding and respect between both parties	Focus group sessions, regular meeti visits to get to know each other, to other's organization and needs and improvement opportunities
	Knowledge transfer/Active learning	Education in the medical and nursing curriculum	Lectures and interactive work sessi organization and needs of hospital care providers

objectives			
			Feedback on the qu summary from an e intern
	Guided practice/Shifting perspective	Student internships in the hospital *and* primary care setting	Students conduct a related to patient di including writing a f supervisors
			Students visit patien skilled-nursing facili discharge and revie
Structural, problem-related feedback between hospital and primary care providers	Stimulus control	Means to facilitate and stimulate structural feedback	Standard feedback t suggestions for imp along with discharg providers
			Distribute a docume local care providers responsible for hosp
Patient-centered attitude	Knowledge transfer/ Consciousness raising	Education and training in the medical and nursing curriculum and in the hospital setting	Lectures on patient- to instruct patients patient needs)
			Interactive lectures faces around the ti
	Modeling/ Individualization	Written and verbal information to inform patient and relatives tailored to their needs and preferences	Brochures on sympt treatment along wit
		Use of visual aids	Pictures or drawing treatment (e.g., me medical and nursing
		Use of plain, patient-friendly, nonmedical language	Discharge summary understandable for explanation of diffic abbreviations)
		Standard discharge consult	Physician plans and discharge consult w or two days prior to

Determinants and change objectives	Theory-based methods	Strategy/ Practical applications	Activities and materials
	Individualization/ Active listening	Teach back	Care provider checks if patients rec discharge information they needed understood the received informatio
	Consciousness raising/ Active learning	Video reflection (of discharge consultations)	Group sessions with colleague healt providers in which self videotaped c consultations are analyzed and disc
	Active learning/ Shifting perspectives	Role-play/ simulation	Students and healthcare providers c play games to learn how to perform discharge consult and to experience discharge from a patient's perspect feedback and discussion.
		Internship	Students, assisted by an inpatient te prepare patients for discharge by co discharge consults and discharge pl
	Consciousness raising/ Shifting perspectives	Story-telling	Patients describe their suboptimal c experiences to students and health providers
Organizational			
Guidelines and standards of evidence-based practice	Standardized working processes	Standardized discharge letter (e.g., templates, formats)	Templates, formats, required (web- clinical decision-support, pick lists
			Provision of decision support, throu copying of important content from record to the discharge letter
		Standardized discharge planning	Guidelines, protocols, checklists for planning, organizing follow-up
		Discharge time out	Key questions about the patient's h and discharge plan are answered ve responsible care provider to a super colleague on the day of discharge
		Standardized verbal handover communication between care providers or to patients	SBAR, ISBAR, and other types of dis communication checklists

objectives			
		Medication reconciliation	Standardized medic medication discrepa (liaison) pharmacist
Technical			
Shared electronic information exchange system	Multi-disciplinary collaboration	Shared electronic patient information system	Electronic notificati about patient hospi (web-based) access information
Patient and relative			
Participation in the discharge process	Consciousness raising/ Knowledge transfer	Verbal and written information on importance of their role in handover at discharge (carry up-to-date medication list)	Information brochu instruction
	Self- management/ Guided practice	Encouraging and facilitating patients in self-management skills	Provide patient wit active problem list, concerns, et cetera) the patient to facilit transfer
			Education and instru including counselin
			Telephone follow-u care provider to dis patient's follow-up
			Patient schedules a with care provider a active participant in
	Stimulus control	Verbal reminder	Remind patients aft share discharge info providers responsib
Skills and dare to speak up	Coaching/ Guided practice	Encouragement and assistance to assert a more active role during discharge (e.g., asking questions and signaling needs and preferences)	Question form for p
			A patient transition

Determinants and change objectives	**Theory-based methods**	**Strategy/ Practical applications**	**Activities and materials**
	Stimulus control	Patient hotline	A 'patient hotline' telephone numbe discharged patients for any questio
Understanding of medical history and/or medication	Guided practice/ Knowledge transfer	Help patient to identify knowledge deficits	Handbook with reminders and ques
			Provide patients a list of 'red flags' i worsening condition and instructior respond to them
		Medication counseling at the hospital at discharge or at the patient's home	Visits by a pharmacist counselor
		Written and verbal information and instructions	Specific brochures on disease, treat community care
			Artificial nurses providing discharge via a video screen at the patient's b
			Teaching session with a nurse educa patient's bedside before discharge c patient's home)
	Active listening	Teach-back	Care provider checks if patients rece discharge information they needed understood the received informatio

NF=not found; NA=not available.

*The majority of the references relate to interventions or a component of a studied intervention program with an aim to im interventions (e.g., improving clinical handovers within the hospital) were also used as references in case they were consid improving hospital discharge.

†Grading of evidence, adapted and adjusted from the Oxford Centre for Evidence-based Medicine Levels of Evidence[33]: 1b randomized controlled trials (RCTs); 1a=RCT of good-moderate quality or sufficient size and consistency; 3-4=comparative patient-control studies); 4=non-comparative studies; 5=Expert committee reports, opinions and/or clinical experience of resp

DISCUSSION

Effective hospital discharge and reducing patient readmission rates are influenced by several behavioral and environmental determinants. The large number of determinants identified in this study underscore the complexity of hospital discharge and the risk for developing intervention programs that do not address the right objective(s) and likely turn out to be ineffective. Our data confirms the need for a systematic approach in developing a multifaceted discharge intervention program.

An extensive overview of theory-based methods and practical strategies suitable for improving patient handover skills and healthcare provider and patient attitudes in the discharge process was done. However, effective interventions do not exist for all identified determinants and the related change objectives. Most interventions are aimed at improving the organizational and technical aspects of the discharge process. There is a lack of evidence-based interventions that focus on improving healthcare provider skills by means of handover training and evidence-based guidance. Moreover, effective interventions of changing the individual healthcare provider (e.g., via education or reminders), patient awareness and attitudes (e.g., via teach-back) and the relationship between providers (e.g., via frequent informal meeting between hospital and primary care providers and reflexive feedback) are lacking. This is despite the overwhelming data and problem analysis showing that awareness, attitudes and skills are key factors for improving hospital discharge and getting quality improvement efforts accepted and used by professionals[12]. More research is needed on the effects of interventions that focus on increasing hospital care provider's knowledge and understanding of the needs and preferences of community care providers and patients to continue care at home, structural reflection by care providers on their discharge practices and care provider's adherence to handover tasks (e.g., writing accurate discharge summaries in time, calling the GP or a standard discharge consultation). The lack of evidence about the effectiveness of interventions may be attributed to the difficulty of measuring attitudes and their effects on healthcare performance[115-117].

Intervention Mapping (IM) was introduced into the field of quality improvement in health care[16], and to our knowledge this is its first application directed towards improving hospital discharge. Our study illustrates the systematic development of a theory and evidence based intervention strategy applied to addressing patient handover at hospital discharge. An important strength of this study is the deliberate assessment of determinants and interventions that affect the discharge process. Qualitative input provides comprehensive insight into a variety of determinants. A survey among research experts in the field of handover and healthcare providers legitimized the prioritization of determinants. Empirical data, the systematic literature review, theories of social behavior and multiple consultation rounds of a broad group of experts (researchers, policy-makers, inspectors) in the field of quality and safety in healthcare, healthcare providers and patient representatives[31], provided useful input for the selection of methods of change, practical strategies and related evidence. We have provided a comprehensive overview of the underlying causes for ineffective hospital discharge, and effective and promising solutions to improve patient handovers from hospital to home.

There are several limitations to this study starting with our focus on the problem analysis at a micro-level. Possible barriers and facilitators at a macro- and meso-levels, i.e., financial and legal obligations or constrains were not included. Moreover, the relationships between the identified determinants and theoretical-based methods and strategies are hypothetical. However, the determinants were systematically and theory-driven and linked to practical strategies using the IM method and were not intuitively chosen. The effectiveness of the intervention strategy should be tested in clinical settings.

In conclusion, applying the IM framework provides a useful framework for choosing and implementing interventions that can guide health care providers to improve hospital discharge in their local settings. The study demonstrates how the IM framework contributes to the creation of a solid rationale for the choice of interventions in advancing the field of quality improvement.

REFERENCES

1. Halasyamani L, Kripalani S, Coleman E, et al. Transition of care for hospitalized elderly patients – development of a discharge checklist for hospitalists. J Hosp Med 2006;1:354-60.
2. Clare J, Hofmeyer A. Discharge planning and continuity of care for aged people: indicators of satisfaction and implications for practice. Aust J Adv Nurs 1998;16:7-13.
3. Hellesø R, Lorensen M, Sorensen L. Challenging the information gap--the patients transfer from hospital to home health care. Int J Med Inform 2004;73:569-80.
4. Cohen SG, Bailey DE. What makes teams work: group effectiveness research from the shop floor to the executive suite. Journal of Management 1997;23:239-90.
5. Cheah LP, Amott DH, Pollard J, Watters DAK. Electronic medical handover: towards safer medical care. Med J Aust 2005;183:369-72.
6. Simpson, K. Handling handoffs safely. MCN Am J Matern Child Nurs 2005;30:152.
7. Friedman B, Basu J. The rate and cost of hospital readmissions for preventable conditions. Med Care Res Rev 2004; 61:225–40.
8. Foekema H, Hendrix C. [Mistakes are expensive, An investigation into medical transcription errors, (Part 2)] Fouten worden duur betaald, Een onderzoek naar medische overdrachtsfouten (deel 2). Amsterdam: TNS NIPO, 2004.
9. Leendertse AJ, Egberts AC, Stoker LJ, et al. Frequency of and risk factors for preventable medication-related hospital admissions in the Netherlands. Arch Intern Med 2008;168:1890–6.
10. Hansagi H, Olsson M, Glas S, et al. Report on the barriers and facilitators to effective handovers in the social, linguistic and technological context in which they take place. Utrecht, The Netherlands: Utrecht Medical Center, 2010.
11. Johnson JK, Farnan J, Barach P, et al. Searching for the Missing Pieces between Hospital and Primary Care: Mapping the Patient Process during Care Transitions. BMJ Qual Saf 2012;21(Suppl 1):i97-105.
12. Hesselink G, Vernooij-Dassen M, Pijnenborg L, et al. Organizational culture: an important context for addressing and improving hospital to community patient discharge. Med Care 2013;51(1):90-8.
13. Campbell M, Fitzpatrick R, Haines A, et al. Framework for design and evaluation of complex interventions to improve health. BMJ 2000;321:694-6.
14. Davis DA, Thomson MA, Oxman AD, et al. Changing physician performance. A systematic review of the effect of continuing medical education strategies. JAMA 1995;274:700-5.
15. Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? Br J Gen Pract 1998;48:991-7.
16. van Bokhoven MA, Kok G, van der Weijden T. Designing a quality improvement interventions: a systematic approach. Qual Saf Health Care 2003;12:215-20.
17. Baker R, Camosso-Stefinovic J, Gillies C, et al. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes (Review). Cochrane Database Syst Rev 2010:CD005470.
18. Bartholomew LK, Parcel GS, Kok G, et al. Planning health promotion programs. An intervention mapping approach. Third edition. San Francisco: Jossey-Bass, 2011.
19. Mullen PD, DiClemente CC, Bartholomew LK. Theory and context in project PANDA: a program to help postpartum women stay off cigarettes. In: Bartholomew LK, Parcel GS, Kok G, Gottlieb NH, editors. Intervention mapping: designing theory and evidence-based health promotion programs. Mountain View, CA: Mayfield Publishing Co., 2001.
20. Schmid AA, Andersen J, Kent T, et al. Using intervention mapping to develop and adapt a secondary stroke prevention program in Veterans Health Administration medical centers. Implement Sci 2010; 5:97.
21. Fernandez ME, Bartholomew LK, Lopez A, et al. Using intervention mapping in the development of a school-based asthma management intervention for Latino children and families: the FAMILIAS project. In: 128th annual meeting of the American Public Health Association, 2000.
22. van Empelen P, Kok G, Schaalma HP, et al. An AIDS risk-reduction program for Dutch drug users: an intervention mapping approach to planning. Health Promot Pract 2003;4:402–12.
23. Heinen MM, Bartholomew LK, Wensing M, et al. Supporting adherence and healthy lifestyles in leg ulcer patients: systematic development of the lively legs program for dermatology outpatient clinics. Patient Educ Couns 2006;61:279-91.

24. Green LW, Kreuter MW. Health promotion planning: an educational and ecological approach, 3rd ed., Mountain View, CA: Mayfield Publishing Co., 1999.
25. Novielli N, Chen YF, van der Klink M, et al. Reporting quantifying the expected benefits of the interventions that will be implemented. Delivery nr 7 of the EU HANDOVER-project, 2010.
26. Corbin J, Strauss A. Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. Qual Sociol 1990;13:3-21.
27. Barach P, Gademan P, Kalkman C, et al. Report on how variations in handover processes lead to near misses and adverse outcomes, and identifying standardized elements of communication. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2010.
28. McEachan RR, Lawton RJ, Jackson C, et al. Evidence, Theory and Context: Using intervention mapping to develop a worksite physical activity intervention. BMC Public Health 2008;8:326.
29. van Achterberg T, Huisman-de Waal GG, Ketelaar NA, et al. How to promote healthy behaviours in patients? An overview of evidence for behaviour change techniques. Health Promot Int 2010;26:148-62.
30. Grol RP, Bosch MC, Hulscher ME, et al. Planning and studying improvement in patient care: the use of theoretical perspectives. Milbank Q 2007;85:93-138.
31. Kutryba B, Dudzik-Urbaniak E, Göbel AA, Pijnenborg L, Barach P. Dissemination of the HANDOVER project – Final report. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2011.
32. Hesselink G, Schoonhoven L, Barach P, et al. Improving patient handovers from hospital to primary care. A systematic review. Ann Intern Med 2012;157:417-28.
33. Oxford Centre of Evidence-Based Medicine. Available at: http://www.cebm.net/index.aspx?o=1025. [Accessed at 31-07-2012].
34. Cabana MD, Rand CS, Powe NR, et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. JAMA 1999,282:1458-65.
35. Grol R, Wensing M, Eccles M. Improving patient care: the implementation of change in clinical practice. London: Elsevier, 2005.
36. Grimshaw JM, Thomas RE, MacLennan G, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. Health Technol Assess 2004;8:1-72.
37. Clarke CM, Persaud DD. Leading clinical handover improvement: a change strategy to implement best practices in the acure care setting. J Patient Saf 2011;7:11-18.
38. Australian Medical Association; Safe Handover: Safe Patients, guidance on clinical handover for clinicians and managers, 2006 ABN 37 008 426 793.
39. Brown C, Hofer T, Johal A, et al. An epistemology of patient safety research: a framework for study design and interpretation. Part 2. Study design. Qual Saf Health Care 2008;17:163-69.
40. Hulscher ME, Laurant MG, Grol RP. Process evaluation on quality improvement interventions. Qual Saf Health Care 2003;12:40-46.
41. Forster AJ, Murff HJ, Peterson JF, et al. The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med 2003;138:161-7.
42. Halfon P, Eggli Y, van Melle G, Chevalier J, Wasserfallen JB, Burnand B. Measuring potentially avoidable hospital readmission's. J Clin Epidemiol 2002;55:573-87.
43. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-services program. N Engl J Med 2009;360:1418-28.
44. Jencks SF. Defragmenting care. Ann Intern Med 2010;153:757-8.
45. Bandura A. Social foundations of thought and action. A social cognitive theory. Englewood Cliffs, New Jersey: Prentice Hall, 1986.
46. Prochaska J, DiClimente C, Norcross J. In search of how people change. Applications to addictive behaviors. Am Psychol 1992;47:1102-14.
47. Prochaska, JO, DiClemente CC. The transtheoretical approach. In: Norcross, JC; Goldfried, MR. (eds.) Handbook of psychotherapy integration. 2nd ed. New York: Oxford University Press, 2005.
48. Pettigrew TF, Tropp LR. When groups meet: The dynamics of intergroup contact. New York: Psychology Press, 2011.
49. Locke EA, Latham GP. A theory of goal setting and task performance. Englewood Cliffs, NJ: Prentice-Hall, 1990.
50. Locke EA, Latham GP. Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. American Psychologist 2002;57:701-17.
51. Wagner EH. The role of patient care teams in chronic disease management. BMJ 2000;320:569-72.

52. Gordon M, Findley R. Educational interventions to improve handover in health care: a systematic review. Med Educ 2011;45:1081-9.
53. Bray-Hall S, Schmidt K, Aagaard E. Toward Safe Hospital Discharge: A Transitions in Care Curriculum for Medical Students. J Gen Intern Med 2010;25:878-81.
54. Lai CJ, Nye HE, Bookwalter T, et al. Postdischarge follow-up visits for medical and pharmacy students on an inpatient medicine clerkship. J Hosp Med 2008;3:20-7.
55. Kaiser Health News: Medicare To Penalize 2,217 Hospitals for Excess Readmissions. Available at: http://www.kaiserhealthnews.org/Stories/2012/August/13/medicare-hospitals-readmissions-penalties.aspx. [Accessed at 01-12-2012].
56. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. Ann Intern Med 2009;150:178-87.
57. Preen DB, Bailey BE, Wright A, et al. Effects of a multidisciplinary, post-discharge continuance of care intervention on quality of life, discharge satisfaction, and hospital length of stay: a randomized controlled trial. Int J Qual Health Care 2005;17:43-51.
58. Caplan GA, Williams AJ, Daly B, et al. A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department – the DEED II study. J Am Geriatr Soc 2004;52:1417-23.
59. Naylor MD, Brooten DA, Campbell RL, et al. Transitional care of older adults hospitalized with heart failure: a randomized, controlled trial. J Am Geriatr Soc 2004;52:675-84.
60. Naylor MD, Brooten D, Campbell R, et al. Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial. JAMA 1999;281:613-20.
61. Rich MW, Vinson JM, Sperry JC, et al. Prevention of readmission in elderly patients with congestive heart failure: results of a prospective, randomized pilot study. J Gen Intern Med 1993;8:585-90.
62. Chiu WK, Newcomer R. A systematic review of nurse-assisted case management to improve hospital discharge transition outcomes for the elderly. Professional Case Management 2007;12:330-6.
63. Coleman EA, Parry C, Chalmers S, et al. The Care Transitions Intervention: Results of a Randomized Controlled Trial. Arch Intern Med 2006;166:1822-8.
64. Avlund K, Jepsen E, Vass M, Lundemark H. Effects of comprehensive follow-up home visits after hospitalization on functional ability and readmissions among old patients. A randomized controlled study. Scand J Occup Ther 2002;9:17-22.
65. Siu AL, Kravitz RL, Keeler E, et al. Postdischarge geriatric assessment of hospitalized frail elderly patients. Arch Intern Med 1996;156:76-81.
66. Peikes D, Chen A, Schore J, et al. Effects of care coordination on hospitalization, quality of care, and health care expenditures among Medicare beneficiaries. JAMA 2009;301:603-618.
67. Balaban RB, Weissman JS, Samuel PA, et al. Redefining and redesigning hospital discharge to enhance patient care: A randomized controlled study. J Gen Intern Med 2008;23:1228-33.
68. Rennke S, Kesh S, Neeman N, et al. Complementary telephone strategies to improve postdischarge communication Am J Med 2012;125:28-30.
69. Chaboyer W, Wallen K, Wallis M, et al. Whiteboards: one tool to improve patient flow. Med J Aust 2009;190:137-40.
70. Hoban V. The nurses who simplified discharge planning. Nursing Times 2007;103:20-21.
71. Crotty M, Rowett D, Spurling L, 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 of a randomized, controlled trial. Am J Geriatr Pharmacother 2004;2:257-64.
72. Morris L, Chen TF. Enhancing communication between hospital and community: multidisciplinary discharge case conferences. Pharm World Sci 2005;27:71-2.
73. Shyu YI, Liang J, Wu CC, et al. Two-year effects of interdisciplinary intervention for hip fracture in older Taiwanese. J Am Geriatr Soc 2010;58:1081-9.
74. Harrison MB, Browne GB, Roberts J, et al. Quality of life of individuals with heart failure: a randomized trial of the effectiveness of two models of hospital-to-home transition. Med Care 2002;40:271-82.
75. Wells M, Harrow A, Donnan P, et al. Patient, carer and health service outcomes of nurse-led early discharge after breast cancer surgery: a randomized controlled trial. Br J Cancer 2004;91:651-8.
76. Bolas H, Brookes K, Scott M, et al. Evaluation of a hospital-based community liaison pharmacy service in Northern Ireland. Pharm World Sci 2004;26:114-20.

77. Rutherford A, Burge B. General practitioners and hospitals. Continuity of care. Aust Fam Physician 2001;30:1101-7.
78. Mohta N, Vaishnava P, Liang C, et al. The effects of a 'discharge time-out' on the quality of hospital discharge summaries. BMJ Qual Saf 2012;21:885-90.
79. Matter CA, Speice JA, McCann JR, et al. Hospital to home: Improving internal medicine residents' understanding of the needs of older persons after a hospital stay. Acad Med 2003;78:793-97.
80. Ratanawongsa N, Federowicz MA, Christmas C, et al. Effects of a focused patient-centered care curriculum on the experiences of internal medicine residents and their patients. J Gen Intern Med 2012;27:473-7.
81. Johnson A, Sandford J, Tyndall J. Written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home. Cochrane Database Syst Rev 2003;CD003716.
82. Katz MG, Kripalani S, Weiss BD. Use of pictorial aids in medication instructions: a review of the literature. Am J Health Syst Pharm 2006;63:2391–7.
83. Houts PS, Doak CC, Doak LG, et al. The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence. Patient Educ Couns 2006;61:173-90.
84. Schillinger D, Piette J, Grumbach K, et al. Closing the loop. Physician communication with diabetic patients who have low health literacy. Arch Intern Med 2003;163:83–90.
85. White M, Garbez R, Carroll M, et al. Is "Teach-Back" Associated With Knowledge Retention and Hospital Readmission in Hospitalized Heart Failure Patients? J Cardiovasc Nurs 2013;28(2):137-46.
86. Cua YM, Kripalani S. Medication use in the transition from hospital to home. Ann Acad Med Singapore 2008;37:136-6.
87. Iedema R, Ball C, Daly B, et al. Design and trial of a new ambulance-to-emergency department handover protocol: 'IMIST-AMBO'. BMJ Qual Saf 2012;21:627-33.
88. Iedema R, Merrick E, Rajbhandari D, et al. Viewing the taken-for-granted from under a different aspect: a video-based method in pursuit of patient safety. Int J Mult Res Approach 2009;3:290–301.
89. Iedema R. Creating safety by strengthening clinicians' capacity for reflexivity. BMJ Qual Saf 2011;20:i83-i86.
90. Shapiro M, Morey J, Small S, et al. Simulation based teamwork training for emergency department staff: does it improve clinical team performance when added to an existing didactic teamwork curriculum? Qual Saf Health Care 2004;13:417-21.
91. van Walraven C, Laupacis A, Seth R, et al. Dictated versus database-generated discharge summaries: a randomized clinical trial. CMAJ 1999;160:319-26.
92. Schnipper JL, Kirwin JL, Cotugno MC, et al. Role of pharmacist counseling in preventing adverse drug events after hospitalization. Arch Intern Med 2006;166:565-71.
93. Graumlich JF, Novotny NL, Nace GS, et al. Patient and physician perceptions after software-assisted hospital discharge: cluster randomized trial. J Hosp Med 2009;4:356-63.
94. Medlock S, Eslami S, Askari M, et al. Improved communication in post-ICU care by improving writing of ICU discharge letters: a longitudinal before-after study. BMJ Qual Saf 2011;20:967-73.
95. King TL. The impact of a nurse-driven evidence-based discharge planning protocol on organizational efficiency and patient satisfaction in patients with cardiac implants. University of Central Florida, 2008.
96. Bump GM, Bost JE, Buranosky R, et al. Faculty member review and feedback using a sign-out checklist: improving intern written sign-out. Acad Med 2012;87:1125-31.
97. Marshall S, Harrison J, Flanagan B. The teaching of a structured tool improves the clarity and content of interprofessional clinical communication. Qual Saf Health Care 2009;18:137-40.
98. Koehler BE, Richter KM, Youngblood L, et al. Reduction of 30-day postdischarge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle. J Hosp Med 2009;4:211-8.
99. Tripp JS. Development and evaluation of notifications to inform primary care providers of summary documentation for their patients' hospital visits. The University of Utah, 2009.
100. Pronovost P, Weast B, Schwarz M, et al. Medication reconciliation: a practical tool to reduce the risk of medication errors. J Crit Care 2003;18:201-5.
101. Smith JD, Coleman EA, Min S. Identifying post-acute medication discrepancies in community dwelling older adults: a new tool. Am J Geriatr Pharmacother 2004;2:141-8.
102. Chen Y, Brennan N, Magrabi F. Is email an effective method for hospital discharge communication? A randomized controlled trial to examine delivery of computer-generated discharge summaries by email, fax, post and patient hand delivery. Int J Med Inform 2010;79:167-72.

103. Afilalo M, Lang E, Léger R, et al. Impact of a standardized communication system on continuity of care between family physicians anrd the emergency department. CJEM 2007;9:79-86.
104. Krumholz HM, Amatruda J, Smith GL, et al. Randomized trial of an education and support intervention to prevent readmission of patients with heart failure. J Am Coll Cardiol 2002;39:83-9.
105. Jovicic A, Holroyd-Leduc JM, Straus SE. Effects of self-management intervention on health outcomes of patients with heart failure: A systematic review of randomized controlled trials. BMC Cardiovasc Disord 2006;6:43.
106. Koelling TM, Johnson ML, Cody RJ, Aaronson KD. Discharge education improves clinical outcomes in patients with chronic heart failure. Circulation 2005;111:179-85.
107. Enguidanos S, Gibbs N, Jamison P. From hospital to home: a brief nurse practitioner intervention for vulnerable older adults. J Gerontol Nurs 2012;38:40-50.
108. Kimmelstiel C, Levine D, Perry K, et al. Randomized, controlled evaluation of short- and long-term benefits of heart failure disease management within a diverse provider network: The SPAN-CHF trial. Circulation 2004;110:1450-55.
109. Hugtenburg JG, Borgsteede SD, Beckeringh JJ. Medication review and patient counselling at discharge from the hospital by community pharmacists. Pharm World Sci 2009;31:630-7.
110. Bickmore T, Pfeifer L, Jack BW. Taking the Time to Care: Empowering Low Health Literacy Hospital Patients with Virtual Nurse Agents; Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI); Boston, MA: 2009.
111. Anderson C, Deepak BV, Amoateng-Adjepong Y, et al. Benefits of comprehensive inpatient education and discharge planning combined with outpatient support in elderly patients with congestive heart failure. Congestive Heart Failiure 2005;11:315-21.
112. Dixon-Woods M, McNicol S, Martin G. Ten challenges in improving quality in healthcare: lessons from the Health Foundation's programme evaluations and relevant literature. BMJ Qual Saf 2012;21:876-84.
113. Weiner BJ. A theory of organizational readiness for change. Implement Sci 2009;4:67.
114. Naylor MD, Aiken LH, Kurtzman ET, et al. The care span: The importance of transitional care in achieving health reform. Health Aff (Millwood) 2011;30:746-54.
115. Parmelli E, Flodgren G, Beyer F, et al. The effectiveness of strategies to change organisational culture to improve healthcare performance: a systematic review. Implement Sci 2011;3;6:33.
116. Scott T, Mannion R, Marshall M, et al. Does organisational culture influence health care performance? A review of the evidence. J Health Serv Res Policy 2003;8:105-17.
117. Gershon RR, Stone PW, Bakken S, et al. Measurement of organizational culture and climate in healthcare. Journal Nurs Admin 2004;34:33-40.

Chapter 8

General Discussion

In this chapter, the main findings of the studies carried out in this thesis are presented and discussed in the light of relevant and recent literature. The findings are summarized according to the attitudinal and behavioral barriers to effective hospital discharge and interventions that address these barriers. Subsequently, the most relevant methodological issues in this thesis and the implications of the results are discussed. Finally, a number of recommendations for practice and research are given.

Main findings

The findings of chapter 2, 3, 4 and 5 show that patient handovers during hospital discharge are hindered by a lack of awareness, interest and knowledge of healthcare providers and patients, which are essential to ensure the continuity of care.

- Physicians and nurses, in particular in the hospital, prioritize their own clinical work and are less concerned with ensuring proper follow-up care in and by the community. Hospital and primary care providers work as separate actors beside each other with insufficient knowledge and understanding of each other's different professional views, needs and work practices. The relationship between hospital and primary care providers is often characterized as distant. Although many interviewed physicians and nurses mentioned the need for a more collaborative attitude and a better relationship with their counterpart colleagues, little proactive action seems to be undertaken so far.
- Many care professionals structurally prioritize actual medical or nursing care above the need for handover. Writing handover letters or organizing aftercare is considered to be administrative and burdensome work, and is often not acknowledged as an aspect of good clinical care. This attitude is enforced by a structural lack of time and the way care providers perceive themselves; e.g., first and foremost to deliver medical or nursing care. Care providers tend to postpone their administrational duties, thereby increasing the chance for information delay and suboptimal handovers.
- Hospital and community providers, on an individual and group level, insufficiently reflect and learn from current handover practices. Care providers are insufficiently educated and trained on how to perform effective handovers at discharge. Feedback between hospital and primary care providers regarding patient handover appears to be an exception rather than a rule. Care providers are skeptical towards structural feedback as their experiences with feedback are disappointing (e.g., no experienced benefits or no constructive atmosphere). Consequently, physicians and nurses are less willing to confront each other about inefficiencies and take current handover practices for granted. As a result, many handover problems remain unspoken and possible opportunities for improvement are missed.
- Hospital care providers over- or underestimate patient capabilities, available informal support and emotional needs at discharge. Time restraints and care provider preoccupation on providing actual care also hinder care providers in being compassionate and responsive

to patient needs and preferences. This leads to patient uncertainty and anxiety, and may increase the risk for wrong medication use or even unnecessary re-hospitalizations.

- Patients and relatives are often unaware of their role in the handover process and the opportunities they have to contribute to better continuity of care. Handovers can be improved when patients, for example, are more aware of the importance of handing over their discharge letters to the GP on time or are aware of the prescribed medication and their medication history.

The second issue of this thesis was identifying theory- and evidence-based interventions to improve hospital discharge. Based on the barriers identified in the previously performed studies, which were behavioral and environmental factors, we formulated targets for behavioral and environmental change. In addition, we identified a wide range of (potential) effective interventions appropriate to change the organization of care and care provider and patient attitudes and behaviors (table 1). The systematic review described in Chapter 6 presents several effective interventions aimed to improve patient handovers from hospital to community care providers, that were tested in RCTs. The Intervention Mapping (IM) study described in Chapter 7 presents an additional number of interventions based on literature and the input of a large group of researchers, policy-makers and healthcare providers.

Interpretation of findings

Our findings contribute to a better insight in the underlying causes for sub-optimal hospital discharge. To our knowledge, this is the first time that discharge practice is studied on a large international scale and based on perceptions and experiences of patients, relatives and their care providers in the hospital and community. A comprehensive view and understanding of the underlying aspects that hinder the continuity of care between hospital and primary care providers, patient-readiness and patient-participation in the discharge process was lacking. So far studies with similar foci were performed on a local scale[1,2,3], with one specific stakeholder (e.g., patients or GPs) or with care providers in only the hospital or community setting[4,5], or with a focus on one specific clinical discipline as research sample[6].

Table 1. Effective or potential effective interventions related to important discharge barriers

	Discharge barriers			
	A fragmented hospital-primary care interface	*Undervaluing administrative tasks*	*Lack of reflection on the discharge process/ integration of best-practices*	*Lack of patient-centeredness and patient awareness and -empowerment*
Interventions	Liaison person coordinating the discharge process*	Electronic discharge notifications to inform primary care provider*	Medication reconciliation checklist*	Discharge (medication) coach/counselor*
	Hospital-based primary contact person*	Electronic tools to facilitate quick and clear discharge summary generation*	Templates to facilitate structured discharge summary generation*	Patient discharge handbook (e.g., question form, list of contact persons and self-care instructions)*
	Shared involvement in follow-up by hospital and community care providers (e.g., follow-up calls, home-based visits)*	Web-based access to discharge information for community care providers*	Discharge planning protocol/guideline*	Follow-up calls or home-based visits of hospital care providers to discuss, check and stimulate patient's follow-up treatment and adherence*
	(Informal) hospital and primary care provider meetings to increase mutual understanding and respect	Visual electronic reminders for writing discharge summaries or organizing follow-up	Means to facilitate structural feedback between hospital and primary care providers (e.g., standard feedback form)	Teach-back
	Education in the medical and nursing curriculum (e.g., lectures, vignette analysis, story-telling or modeling)	Financial penalties or incentives	Education and training in the medical and nursing curriculum (e.g., lectures and exercises with discharge guidelines or protocols)	Education in the medical and nursing curriculum (e.g., lectures, vignette analysis, story-telling or modeling)
	Student internships in the hospital *and* primary care setting	Mandatory administrative tasks (e.g., completing information fields for sending a discharge letter)		Standard discharge consult with patients and relatives
	Bilateral communication agreements			Verbal *and* visual discharge information

* Interventions that showed statistically significant effects in controlled studies.

Our findings also give a better insight in appropriate solutions for improving the discharge process. The systematic review (chapter 6) and the IM study (chapter 7) provided an overview of interventions to improve hospital discharge. However, the results of both studies also indicate that evidence for the effectiveness of intervention programs or specific components is limited. Like other reviews on patient handovers have shown before[7,8], comprehensive evaluation of the effectiveness of discharge interventions is complex and conclusions need to be drawn cautiously.

This is due to the inadequate description of studied interventions, the interactions between the studied intervention components, the difficulty of behavioral change required by those delivering or receiving the interventions, the clinical diversity of patients, the different professional background and attitudes of care providers targeted by the interventions and the variability of outcomes used in intervention studies[9]. These aspects hinder an appropriate and direct evaluation of the interventions. Hence, to evaluate discharge interventions appropriately, studies should take into account the multiple local factors affecting hospital discharge beyond the scope of the intervention itself[10]. Second, to draw comparisons between discharge interventions, studies require clearer intervention descriptions[11]. Furthermore, interventions need to be evaluated in uniform clinical settings, using uniform and valid outcome measures[12].

In line with the findings of other studies[8,13], the findings of the systematic review show that the effectiveness of most discharge interventions is heterogeneous and limited in daily practice. Explanations for these disappointing results include the difficulty of testing and evaluating interventions, changing existing practice and the use of inadequate methods to design interventions[14-16].

Another important explanation for the lack of effectiveness of interventions in daily practice may be found in the suboptimal choices of intervention strategies by researchers, care providers and policy-makers responsible for quality improvement in the local setting. Literature shows that many improvement initiatives are implemented intuitively without a sufficient analysis of the local needs and available suitable interventions[14,16]. Our IM study provides a systematic and well-structured guiding framework including theory-based strategies and practical tools to allow researchers, care providers and policy-makers to make choices on a more rational basis.

Finally, the results of the systematic review and the IM study show that most of the identified discharge intervention programs are directed to influencing the external (i.e., infrastructural and technical) factors affecting hospital discharge rather than influencing aspects of organizational culture (i.e., the underlying professional norms, values, assumptions and subsequent attitudes and behaviors). This is remarkable as the findings in chapter 2, 3, 4 and 5 of this thesis show that attitudes and behaviors of care providers to a large extent may influence the quality and safety of hospital discharge. In other words, there is a gap between the discharge improvement needs and evidence-based interventions that are suitable to address these needs. For example, there is lack of evidence regarding the effect of discharge education and training of healthcare professionals or students in the medical or nursing curriculum and lack of evidence regarding the effect of site visits and collaborative meetings between hospital and primary care providers to increase mutual understanding and respect for each other's work patterns and needs.

Methodological considerations

A variety of research methods have been used to examine the research questions of this thesis. In the separate chapters, the specific limitations have already been discussed. We will provide general reflections on the methodological limitations and strengths regarding our findings and the research methods used.

Qualitative study design

The use of individual and focus group interviews in chapter 2, 3, 4 and 5 provided valuable insights into the attitudes and behaviors (and the underlying shared values, beliefs, assumptions and norms) of patients, relatives and care providers in the hospital and community which was a central focus in this thesis. These constructs are difficult to identify and assess by quantitative research methods alone[17,18].

Context

The qualitative studies in chapter 3, 4 and 5 were performed in five European Union (EU) countries with each country having their own distinct healthcare delivery, policy and funding systems. These systems comprise unique legislative, cultural and organizational characteristics. The studies were also performed in different clinical settings. This diversity of settings makes it difficult to draw comparisons. Although the variation in systems and its influence on the findings were frequently discussed during regular face-to-face meetings or via e-mail correspondence in the period of data collection and analysis, the local and specific impacts of identified barriers may have been under appreciated. However, we did identify several clear differences in the hospital and primary care provider relationships and care provider attitude towards handover administrative tasks between the various participating countries (see chapter 3). A mixed-methods study on the role of national health systems (e.g., funding and legislation) on patient handovers at discharge may provide a better insight in the local needs for improvement and the variations in quality and safety of hospital discharge across European countries.

Participants

Another limitation of this thesis is that we focused primarily on hospital and primary care physicians and nurses, patients and relatives. Although they may be seen as the most important stakeholders in the discharge, effective and safe hospital discharge often also depends on the contributions of other types of stakeholders such as: hospital and community pharmacists, social workers, rehabilitation (e.g., physical and occupational) therapists, middle and higher management (e.g., nurse team leaders, ward managers and the board of directors), support staff (e.g., planners, secretaries), and on a macro-level health insurers and health policy-makers. Including their views in the studies on discharge barriers and effective interventions would be of extra value.

Transferability and credibility of findings

Another methodological consideration deals with the transferability and credibility of the findings resulting from the data collected across the various European countries. First, individual and focus group interviews were transcribed in the respective native languages of the five countries. This may have increased the chances of errors and variations in the interpretation of the data[19]. All efforts were made to ensure the methodological rigor and validity of the translations from English to the native languages across the study sites by using a standardized code book in English, by performing a pilot analysis of local interview transcripts and by sharing and comparing our results in frequent meetings and via telephone or e-mail. Methodological rigor was furthermore ensured by the use of a standardized format for the transcription of the interviews and by the use of Atlas.ti which is computer-assisted software to facilitate a rigorous and systematic analysis by researchers in the participating countries.

Our qualitative research may have been sensitive to bias due to researcher's predominance to certain topics investigated in the studies. Researcher bias happens when the selection of data is influenced by the researcher's preconceptions[20]. We have attempted to rule out researcher bias in several ways. First, two local researchers coded the local data independently. Second, at the end of each interview, findings were summarized by the interviewer and checked by the interviewee. Unfortunately, member checking by sending a summary of the interview transcript to the interviewees was not performed in each country.

A multicentre and multinational qualitative study requires careful planning and coordination to ensure systematic and rigorous examination of all the data collected. Throughout the qualitative studies performed within in the HANDOVER project, two senior qualitative researchers conducted an ongoing internal quality audit, adapted from Mays and Pope[21] and from Tong et al.[22] to monitor whether the data were collected, analyzed and reported according to the agreed protocol. The quality assurance plan (see table 2) ensured consistency of methods in the data collection and analysis throughout the study and between the five study sites[23].

Selection of methods and practical applications in the IM study

The selection of most theory-based methods and a substantial number of practical strategies in the IM study (chapter 7) was partly based on a pragmatic and creative process. Nevertheless, the selection of the theory-based methods and practical strategies was supported by the findings of our systematic review in chapter 6 and based on a large amount of expertise. Selection was performed after 11 discussion sessions with a multi-disciplinary project group (e.g., a hospital physician, a hospital nurse and three researchers, all experts in health-, social- and organizational sciences) and based on the input from ≥ 200 experts in the field of quality and safety of healthcare (e.g., policy-makers, healthcare providers, researchers, health inspectors and patient representatives) in three HANDOVER expert meetings. Although interventions were selected based on empirical evidence, relevant to the target populations and with a focus on changeable behaviors, we did not study the feasibility of the identified discharge interventions in chapter 6 and 7 in terms of their cost-effectiveness and time investment nor did we perform and test the multi-component intervention program due to a lack of resources.

Table 2. Template for the HANDOVER Quality Assurance Report[23]

Questions		*Answers*
1.	How were the data collected?	...
2.	Could the evidence (field work notes, interview transcripts, recordings, documentary analysis, etc.) be inspected independently by others?	Yes/No
3.	How were themes and concepts identified from the data?	...
4.	Who conducted the interviews, focus groups, process mapping, and artifact analyses?	...
5.	Was the analysis repeated by more than one researcher to ensure reliability?	Yes/No
6.	How were participants selected (e.g., purposive, convenience, consecutive, snowball)	n = ...
7.	Method of approach – How were participants approached (e.g., face-to-face, telephone, mail, email)?	...
8.	Sample size – How many participants were in the study? How many people refused to participate or dropped out?	n = ...
9.	Interview guide	
	a) Were questions, prompts, guides provided by the authors?	Yes/No
	b) Was it pilot tested?	Yes/No
	c) Is it being made available?	Yes/No
10.	Focus group guide	
	a) Were questions, prompts, guides provided by the authors?	Yes/No
	b) Was it pilot tested?	Yes/No
	c) Is it being made available?	Yes/No
11.	Audio/visual recording – Did the research use audio or visual recording to collect the data?	Audio/Visual
12.	How many data coders coded the data?	n = ...
13.	Were participant quotations presented to illustrate the themes/findings?	Yes/No

Adapted from: Mays and Pope[21] and Tong et al.[22]

Implications for future practice and research

A variety of recommendations for future practice and research can be derived from the different studies in this thesis. The recommendations are summarized in table 3.

Practice

The results of this thesis highlight that, irrespective of the provision of medical or nursing care, the continuity of care at the patient's discharge is often insufficient. Critical aspects in the handover of care from hospital to the community (e.g. collaboration, administration, feedback, informing the patient, patient/ family education) do not always get the desirable attention as they interfere with other (professional) values, beliefs and interests of the care providers. Therefore, in order to improve the quality and safety of handovers, *more care for patient handover* is needed. Future interventions should be directed both at the level of care provider behaviors (and underlying shared values, beliefs, assumptions) and at the organizational or technical level, with a focus on improving the interactions between care providers, patients and relatives, as well as on improving the interactions between hospital and community care providers.

Moreover, such a behavioral change primarily needs to result from the intrinsic motivation of the professional. The results of this study show that a shared interest and sense of ownership for the handover process among hospital and primary care providers is currently insufficient. Therefore, it is imperative that hospital and primary care providers value continuity of care more as an important goal; something they have in common and that is a core task for each care provider. Based on the results and the conclusion of this study, the following suggestions can be made:

Improve the knowledge and understanding between hospital and primary care providers

The clinicians often take their current handover practices for granted. The scope of their vision is often narrowed down to the values and beliefs that have the priority within their own hospital or primary care boundaries, thereby preventing them from gaining a clear appreciation of the whole handover process, and the impact of their actions on the continuity of care. Therefore, physicians and nurses in the hospital need to be more aware of what is going on in the primary care, and vice versa to gain a better understanding of the actions, expectations and needs of their counterparts. Interviews have shown several fine examples of physicians and nurses who became more aware of and were able to anticipate the needs of their counterparts. A better knowledge and understanding between hospital and primary care may be enhanced through collaborative meetings or bridging practices and educational exchange programs.

Improve care provider appraisal of and compliance with administrative tasks related to discharge

Administration is key to a continuous care process and therefore an effective and safe handover. Hence, it is important that physicians and nurses do not perceive administrational tasks (e.g., organizing planning discharge, organizing follow-up and writing referral or discharge letters) to be of less importance than medical or nursing care, something that can wait until the end of the day or even tomorrow. Because physicians and nurses have limited time and are under constant pressure to provide care, it is very important that administrational tasks are not postponed but executed as soon as possible. Otherwise, as indicated by several interviewed physicians and nurses, administration starts to become a burden: extra work that has been piling up towards the end of the day or week and, subsequently, is suspended to another moment. The importance of handover administration as well as the benefits of doing this on time should be brought more to the attention of physicians, nurses and policy-makers. Awareness of and compliance with administrative tasks could be enhanced with the display of warning signs or reminders in electronic agenda's or financial penalties as a last resort when certain administration tasks are not executed in time.

Improve care provider reflection on discharge practices

The willingness and ability to reflect and learn from mistakes in the past is essential for improving future patient handovers at hospital discharge. It is important to encourage a more structured and constructive way of reflecting on discharge practice and to identify opportunities for improvement, both at a personal and group level. Possibly via face-to-face meetings or integrating (online) structured feedback sessions or open discussion forums. Furthermore, exemplary handovers and concrete points of improvement should be more appreciated and celebrated as such, to make the added value of feedback visible as a motivation for further improvement.

Improve patient-centeredness

Handovers also require a more pro-active attitude of physicians and nurses to anticipate on patient-anxiety and the need for patients and relatives to receive clear and understandable information at handover. This may be enhanced through educating and training care providers and students on aspects of patient-centered care, and a formalized face-to-face discharge consultation, in an 'interruption free' location, for patients who are about to be discharged. The patient should then be assessed for their level of understanding. For example, by being asked to repeat or elaborate on the information received (i.e., teach-back technique). Specific tools to facilitate the information exchange to patients and relatives might include the use of pictures or an instruction video. Electronic notifications can be used to communicate patient's medical and psychosocial information, in time, to community care providers.

Improve patient awareness and empowerment

The interviewees highlighted that many patients and relatives are unaware of the important role they can play in handovers and the value of being empowered enough to speak up. This often hinders the continuity of care at handovers, as discharge letters do not reach the GP (on time), medication lists are not up-to-date, or important personal issues (e.g. complex home situation, anxiety) are overlooked. Therefore, increased awareness of patients and relatives concerning their own responsibilities and their involvement in ensuring the continuity of care would contribute to the quality and safety of handovers. Especially because in most countries patients and relatives are the most important link in the information transfer between hospital and primary care. Concrete interventions to increase patient awareness and empowerment may include: an information flyer, brochure or specific person designated to educate patients or relatives and to help them to pick up their own pro-active role.

Research

First, future research on discharge barriers and improvement efforts should be expanded to other types of stakeholders besides physicians and nurses. Pharmacists, social workers, rehabilitation therapists and support staff are often directly involved in the discharge process, but their impact on the quality of a patient's discharge is still relatively unknown.

Second, future research is needed to study the association of attitudes and behaviors with the quality of the discharge process and with quality of care outcomes, preferably using existing models like the model of Gittel et al.[24,25]. For example, we suggest to study the impact of a weak relationship between hospital physicians and GPs (e.g., lack of respect or lack of knowledge about each other's needs) on frequent, timely and accurate discharge communication and the number of hospital readmissions within 4 weeks of a patient's discharge. This to identify the impact of local attitudinal and behavioral problems on the quality of hospital discharge which may persuade care providers and executives to take action to improve discharge practice. A mixed-methods approach is probably needed to relate such underlying discharge barriers with discharge process and outcome measures.

Third, future research on developing and implementing effective intervention programs is crucial to improve the discharge process. In particular, research is needed on interventions that address the barriers to effective hospital discharge identified in this thesis: i.e., finding ways to effectively increase hospital care provider's knowledge and understanding of the needs and preferences of community care providers and patients to continue care at home, structural reflection by care providers on their discharge practice, and care provider appraisal of and adherence to handover tasks. This thesis gives a comprehensive overview of solutions to many of the identified attitudinal and behavioral barriers. However, robust evidence for discharge interventions currently lacks, mainly due to the complex, multi-component character of most interventions, the lack of vital information about the intervention activities and the heterogeneity of settings these interventions are tested in. Therefore, future research on discharge improvement efforts requires clearly defined and reproducible interventions, a process analysis of interventions tested, and interventions need to be evaluated on uniform and valid outcome measures.

Table 3. Summary of recommendations for improving discharge practice

Improve the knowledge and understanding between hospital and primary care providers
Improve care provider appraisal of and compliance with administrative tasks related to discharge
Improve care provider reflection on discharge practices
Improve patient-centeredness in the discharge process
Improve patient awareness and empowerment in the discharge process

Final conclusion

This thesis aimed to contribute to a better insight and understanding of the attitudinal and behavioral barriers to effective and safe hospital discharge, and to identify appropriate and effective solutions. By the use of mainly qualitative research methods (i.e., individual and focus group interviews) we were able to grasp the underlying shared values, beliefs, assumptions, and norms of care providers in the hospital and community, patients and relatives that greatly influence the discharge process.

Our findings show that many care providers, patients and relatives perceive hospital discharge to be suboptimal. Their perceptions and recent experiences with hospital discharge support the numerous studies demonstrating the results of poorly executed transitions. However, these same studies failed in identifying the underlying causes for many of the discharge problems. The findings of this study suggest that the quality of transitions is greatly influenced by the extent to which care providers, driven by professional norms and values, and by the organization of care, value handovers as an essential part of good clinical practice. Despite the fact that many discharge problems in various clinical and national settings seem to be caused by care provider or patient related attitudes and behaviors, little is still known about the effectiveness of promising discharge interventions that address these types of causes. Therefore, we consider future research on this matter as a key aspect for discharge quality improvement. Our research provides clues and suggestions for improvement and provides a systematic framework to help care providers, managers and policy-makers connect improvement strategies to local discharge problems.

References

1. Atwal A. Nurses' perceptions of discharge planning in acute health care: a case study in one British teaching hospital. J Adv Nurs 2002;39:450-58.
2. Hellesø R, Lorensen M, Sorensen L. Challenging the information gap-the patients transfer from hospital to home health care. Int J Med Inform 2004;73:569-80.
3. Evans K, Mayer J, Treloar C. Who cares? A focus group study on follow up care after discharge from hospital. Aust Fam Physician 2000;29:384-8.
4. Arora VM, Prochaska ML, Farnan JM, et al. Problems after discharge and understanding of communication with their primary care physicians among hospitalized seniors: a mixed methods study. J Hosp Med 2010;5:385-91.
5. Pantilat SZ, Lindenauer PK, Katz PP, et al. Primary care physician attitudes regarding communication with hospitalists. Am J Med 2001;111:15S-20S.
6. Ruth JL, Geskey JM, Shaffer ML, et al. Evaluating communication between pediatric primary care physicians and hospitalists. Clin Pediatr (Phila) 2011;50:923-8.
7. Chiu WK, Newcomer R. A systematic review of nurse-assisted case management to improve hospital discharge transition outcomes for the elderly. Prof Case Manag 2007;12:330-6.
8. Mistiaen P, Francke AL, Poot E. Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic meta-review. BMC Health Serv Res 2007;7:47.
9. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ 2008;337:a1655.
10. Philibert I, Barach P. The European HANDOVER Project: a multi-nation program to improve transitions at the primary care – inpatient interface. BMJ Qual Saf 2012;21:Suppl 1:i9-i12.
11. Bray-Hall ST. Transitional care: focusing on patient-centered outcomes and simplicity. Annals Intern Med 2012;157:448-9.
12. Naylor MD, Aiken LH, Kurtzman ET, et al. The care span: The importance of transitional care in achieving health reform. Health Aff (Millwood) 2011;30:746-54.
13. Hansen LO, Young RS, Hinami K, et al. Interventions to reduce 30-day rehospitalization: a systematic review. Ann Intern Med 2011;155:520-8.
14. Campbell M, Fitzpatrick R, Haines A, et al. Framework for design and evaluation of complex interventions to improve health. BMJ 2000;321:694-6.
15. Davis DA, Thomson MA, Oxman AD, et al. Changing physician performance. A systematic review of the effect of continuing medical education strategies. JAMA 1995;274:700-5.
16. Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? Br J Gen Pract 1998;48:991-7.
17. Davies H, Nutley SM, Mannion R. Organisational Culture and Quality of Health Care. Qual Health Care 2000;9:111-9.
18. Scott T, Mannion R, Marshall M, et al. Does organisational culture influence health care performance? A review of the evidence. J Health Serv Res Policy 2003;8:105-17.
19. Larkin PJ, Dierckx de Casterlé B, et al. Multilingual Translation Issues in Qualitative Research: Reflections on a Metaphorical Process. Qual Health Res 2007;17:468-76.
20. Pope C, Ziebland S, et al. Qualitative research in health care. Analysing qualitative data. BMJ 2000;320:114-6.
21. Mays N, Pope C. Qualitative research in health care. Assessing quality in qualitative research. BMJ 2000;320:50-2.
22. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care 2007;19:349-57.
23. Johnson JK, Barach P, Vernooij-Dassen M. Conducting a multicentre and multinational qualitative study on patient transitions. BMJ Qual Saf 2012;21(Suppl 1):i22-8.
24. Gittell JH, Weiss L. Coordination networks within and across organizations: a multi-level framework. J Manage Stud 2004;41:127-53.
25. Gittell JH, Weinberg D, Pfefferle S, et al. Impact of relational coordination on job satisfaction and quality outcomes: a study of nursing homes. Hum Resource Manage J 2008;18:154-70.

Summary

This thesis consists of two parts. The first part (chapter 2, 3, 4 and 5) primarily focuses on gaining insight in the behavioral barriers and the underlying norms, values and assumptions of care providers and patients to effective hospital discharge. The second part of the thesis (chapter 6 and 7) concentrates on the identification of (effective) interventions to improve the quality of hospital discharge. The studies presented in this thesis were performed as part of a larger European study on patient handovers between the hospital and community setting (HANDOVER; www.handover.eu).

Chapter 1 explains the increased importance of effective and safe hospital discharge. This is necessary because patients require more frequent and complex transitions from hospital to home. While hospital discharge is a critical episode within the care process, evidence shows that sub-optimal patient handovers from hospital to home often lead to a decreased quality of the care process, and an increase of re-hospitalizations and avoidable costs. Studies have identified a range of quality and safety deficits, but insight in the underlying causes and suitable effective discharge interventions is scarce. To improve hospital discharge, the underlying barriers that healthcare providers, patients and relatives perceive should be identified and theory- and evidence-based solutions should be implemented.

Chapter 2 presents the results of a study on the barriers and facilitators to effective hospital discharge performed in one university hospital and the related community care area in the Netherlands. Thirty healthcare providers from the hospital and primary care participated in the focus group interviews. Eight patients and relatives participated in individual interviews. Based on the results from the interviews, questionnaires were developed and distributed among patients, relatives and related nurses and physicians from hospital and community care. Questionnaires were returned by 344 healthcare providers and 206 patients and relatives. Results show that information exchanged from the hospital to community care is often experienced as incomplete, unclear and delayed by healthcare providers, especially when it concerns the exchange of information between hospital physicians and GPs. Coordination of care is frustrated by a lack of collaboration and a lack of knowledge of each other's needs and capabilities between hospital and community care providers. The study illustrates that lack of knowledge, understanding and interest between hospital and community care providers are important causes for ineffective and unsafe discharge.

Chapter 3 reports the results of a qualitative study with the focus on exploring the impact of organizational culture, meaning the social phenomena in terms of attitudes or behavior, that emerge from a common way of sense-making, on the quality of hospital discharge. In five European Union (EU) countries 192 individual and 26 focus group interviews were conducted with patients and relatives, hospital physicians, hospital nurses, general practitioners (GPs) and community nurses. Interview transcripts were analyzed separately in each country based on the

Grounded Theory approach. Subsequently, themes were identified after comparing and synthesizing the local analyses. Three themes emerged that represent aspects of organizational culture: 1) a fragmented hospital-primary care interface; 2) undervaluing administrative tasks relative to clinical tasks; and 3) lack of reflection on the discharge process or process improvement. Hospital discharge is often frustrated by an inward focus of hospital care providers, their lack of awareness to the needs, skills and work patterns of the GPs and community nurses, the lack of a collaborative attitude, and a formal and distant relationship between hospital and primary care providers. Furthermore, the professional duty of providing care in a 'here and now' situation often prevails in care providers minds and takes precedence over dealing with important administrative handover tasks. Consequently, community care providers are insufficiently informed about patient outcomes, thereby increasing the risk for inadequate follow-up. Healthcare providers also describe negative attitudes towards feedback, discharge practice being ruled by habits, and a lack of appreciating and integrating new practices, leaving discharge problems often unspoken with opportunities for improvement overlooked. The findings of this study suggest, that the extent in which hospital care providers value handovers and the outreach to community care providers is critical to effective hospital discharge.

Chapter 4 presents the results of a qualitative study of perceptions and experiences of care providers, patients and relatives regarding patient-centered care in the discharge process. Data were analyzed from the individual and focus group interviews that were conducted in five EU countries (see chapter 3). Four themes emerged: 1) care providers do not sufficiently prioritize discharge consultations with the patient and relatives, due to time restraints and their preoccupation on providing medical and nursing care; 2) patients are not structurally involved in planning and organizing post-discharge care; 3) patient-specific needs and preferences in the discharge process are insufficiently recognized or poorly assessed; and 4) external factors, such as the pressure on available beds and shift work negatively affect a patient-centered discharge. The findings of this chapter indicate that in the discharge process the needs of the patient often do not come first. Patient discharge readiness is determined by the extent to which care providers, driven by professional norms and values and by the organization of care, are willing and able to accommodate patients' capabilities, needs and preferences.

Chapter 5 describes the results of a qualitative study to explore patient experiences and perceptions regarding their participation in care transitions between the hospital and home (i.e., referral and hospital discharge). A secondary analysis of data was performed on reports that investigated stakeholder perceptions regarding these transitions. The reports were based on individual and focus group interviews with 90 patients conducted in five European countries. Patients' positioning and participation in this process varied: from being the key actor, sharing the responsibility with care provider(s) to being passive participants. Patients expressed preferences for being the key actor as well as for healthcare providers to be key actors. However, when patients feel urged or expected to take the key role in the handover process, but are not willing or capable of taking this responsibility in the handover process, it can be a burden and a risk for suboptimal patient transitions between the hospital and home. Patients preferred a handover process where the responsibility for the handover communication was clear and unambiguous. This chapter shows that, to improve hospital discharge, care providers need to consider and discuss more with patients to what extent the patient or family is able or willing to undertake an active role in the discharge process, for instance by taking the responsibility to hand over discharge information.

Chapter 6 describes a systematic literature review of interventions aimed to improve patient handovers from hospital to primary care that were tested in randomized controlled trials (RCTs). We evaluated intervention characteristics, and their overall effects as well as the characteristics of the study they were tested in. Of the 36 included studies, 25 showed statistically significant effects in favor of the intervention group. In almost all studies multi-component interventions were used. Effective interventions included: medication reconciliation, electronic tools to facilitate quick, clear and structured summary generation, discharge planning, shared involvement in follow-up by hospital and community care providers, use of electronic discharge notifications and web-based access to discharge information for GPs. Statistically significant effects were mostly found in reducing hospital utilization (e.g., readmissions), improvement of continuity of care (e.g., accurate discharge information), and improvement of patient status (e.g., satisfaction) after discharge. Surprisingly only 3 of the 36 studies described intended actions with the aim to influence the behavior of care providers, while our results from the earlier chapters suggest that the attitude of the professional and aspects of organizational culture are important factors in influencing the quality and safety of hospital discharge. When analyzing the studies we concluded that most of the intervention's aims and components were poorly described. The heterogeneity in sample size, clinical setting and in outcomes, the poor description of interventions and the use of inappropriate outcome measurements hinder the demonstration of evidence to support interventions as recommendations for practice.

Chapter 7 presents the results of the systematic and theory-based method of Intervention Mapping (IM) for the development of an intervention program to improve hospital discharge. IM exists of six consecutive steps. In step 1, an extensive problem analysis was carried out studying the scale, causes, and consequences of ineffective hospital discharge. In step 2, based on the determinants found, we specified what should be improved as a result of the intervention program and who and what needs to change as a result of the intervention program. In step 3, based on the determinants found and the specified performance and change objectives, theory-based methods of change and related practical strategies were selected. In step 4, an overview of theory-based methods and strategies to improve hospital discharge were presented. For each strategy the level of evidence was indicated. In step 5 and 6, we made suggestions for researchers, professionals and policy-makers for developing, implementing and evaluating the intervention program. The findings from the problem analysis indicate that interventions should be aimed at the individual care provider, the patient, the relationship between providers, and organizational and technical factors related to ineffective discharge. Step 2 and 3 pointed to a variety of behavioral and organizational theory-based methods (e.g., consciousness raising and guided practice) and strategies (e.g., standard discharge templates, discharge planning reminders, site visits and teach-back) aimed at changing the important determinants. The findings of this chapter may serve as a rationale for providers and policy-makers to improve hospital discharge and provide guidance in developing intervention programs tailored to their local settings.

In **chapter 8**, the final chapter of this thesis, the most important findings and conclusions from the studies in chapters 2 through 7 are discussed. The results are placed in wider perspectives and compared with other studies. The most relevant methodological limitations are considered, practical implications are presented and recommendations are put forward for further research.

It can be concluded that, in order to improve the quality and safety of hospital discharge, more care for patient handover is needed. Future discharge interventions should primarily aim at improving: a) the knowledge and understanding between hospital and primary care providers; b) care provider appraisal of and compliance with administrative tasks; c) reflection on discharge practices by care providers; d) a patient-centered approach of care providers in the discharge process; and e) the awareness among patients of the important role they can fulfill in the discharge process with their knowledge and social resources.

Samenvatting

Dit proefschrift bestaat uit twee delen. Het eerste deel (hoofdstuk 2, 3, 4 en 5) richt zich voornamelijk op het verkrijgen van inzicht in het gedrag en de onderliggende normen, waarden en overtuigingen van zorgverleners en patiënten, die een effectief ziekenhuisontslag belemmeren. Het tweede deel van het proefschrift (hoofdstuk 6 en 7) is gericht op het identificeren van effectieve interventies om de kwaliteit van het ontslagproces te verbeteren. De studies die in dit proefschrift worden beschreven zijn uitgevoerd in het kader van een groter Europees onderzoek naar de overdracht van zorg tussen de eerste en tweede lijn (HANDOVER; www.handover.eu).

Hoofdstuk 1 geeft een algemene inleiding over de overdracht van zorg bij ziekenhuisontslag. Een effectief en veilig ontslag wordt steeds belangrijker als gevolg van een toename van patiënten die vaker complexere zorgoverdrachten van ziekenhuis naar thuis behoeven. Ondanks dat het ontslagproces een kritische fase is in het zorgtraject van patiënten, blijkt de overdracht van zorg vaak suboptimaal te verlopen. Dit leidt tot onnodige ziekenhuisheropnames en kosten. Verschillende studies hebben verschillende tekortkomingen in de effectiviteit en veiligheid van het ziekenhuisontslag aangetoond, maar het inzicht in de factoren die hieraan ten grondslag liggen en kennis over geschikte interventies om de overdracht van zorg te verbeteren is beperkt. Een beter inzicht in de onderliggende barrières die zorgverleners, patiënten en naasten ervaren, en in theoriegefundeerde en effectieve oplossingen, is nodig om de kwaliteit en veiligheid van ziekenhuisontslag te verbeteren.

In **hoofdstuk 2** worden de resultaten van een onderzoek naar belemmerende en bevorderende factoren voor een effectief ontslag gepresenteerd. Het onderzoek is uitgevoerd in een Universitair Medisch Centrum en in de bijbehorende eerstelijns gemeenschap. Focusgroep interviews werden gehouden met 30 eerste- en tweedelijns zorgverleners. Individuele interviews werden gehouden met acht patiënten en hun naasten. Op basis van de resultaten van de interviews werden vragenlijsten ontworpen en verspreid onder patiënten, hun naasten en betrokken artsen en verpleegkundigen in de eerste en tweede lijn. In totaal stuurden 344 zorgverleners en 206 patiënten en naasten een ingevulde vragenlijst terug. Hieruit blijkt dat zorgverleners de informatieoverdracht van ziekenhuis naar thuis, en in het bijzonder tussen de specialist en de huisarts, vaak als onvolledig, onduidelijk en te laat ervaren. De coördinatie van zorg wordt belemmerd door een gebrek aan samenwerking tussen zorgverleners in de eerste en tweede lijn en door onvoldoende kennis van de zorgverleners in het ziekenhuis over de mogelijkheden en vaardigheden van hun collega's in de eerste lijn en de thuissituatie van de patiënt. Het onderzoek laat zien dat een gebrek aan kennis, begrip en interesse tussen zorgverleners in de eerste en tweede lijn belangrijke oorzaken zijn voor een ineffectief en onveilig ziekenhuisontslag.

Hoofdstuk 3 beschrijft de resultaten van een kwalitatief onderzoek naar de invloed van organisatiecultuur op de kwaliteit van het ziekenhuisontslag. Onder organisatiecultuur verstaan wij sociale fenomenen in termen van attituden of gedrag, die voortkomen uit binnen de organisatie gedeelde zin- en betekenisgeving. 192 individuele en 26 focusgroep interviews werden gehouden in vijf Europese Unie landen met patiënten, naasten, artsen en verpleegkundigen in het ziekenhuis, huisartsen en wijkverpleegkundigen. Interviewtranscripten werden per land geanalyseerd aan de hand van de 'grounded theory' benadering. De landspecifieke analyses zijn vervolgens samengevoegd, vergeleken en in thema's ondergebracht. Drie thema's kwamen uit de analyse naar voren: 1) de eerste en tweede lijn zijn twee verschillende werelden; 2) zorgverlening heeft meer prioriteit dan het ontslagproces; en 3) een gebrek aan reflectie op en verbetering van het ontslagproces in de dagelijkse praktijk. Een effectief ziekenhuisontslag wordt vaak belemmerd door een interne gerichtheid van zorgverleners in het ziekenhuis, een gebrek aan inzicht in de behoeften, vaardigheden en werkzaamheden van huisartsen en wijkverpleegkundigen, een gebrek aan samenwerking en een formele en koele verstandshouding tussen de eerste- en tweedelijns zorgverleners. Artsen en verpleegkundigen identificeren zich het meest met hun primaire taak, namelijk het daadwerkelijk verlenen van zorg in het 'hier en nu'. Administratieve taken, zoals het op tijd schrijven van ontslagbrieven en het plannen van nazorg zijn van secundair belang en worden zelfs als een last beschouwd. Dit heeft tot gevolg dat eerstelijns zorgverleners onvolledig en te laat worden geïnformeerd over het ontslag van een patiënt waardoor de kans op suboptimale nazorg wordt vergroot. Het terugkoppelen van fouten of misverstanden bij overdrachtssituaties blijkt nauwelijks plaats te vinden door tijdgebrek, maar ook door een sceptische houding van artsen en verpleegkundigen tegenover het nut van terugkoppeling. Veel artsen en verpleegkundigen gaven aan niet getraind of opgeleid te zijn in het goed opzetten en uitvoeren van overdrachtsituaties en waren onbekend, terughoudend of niet gewend aan het omgaan met nieuwe methodieken zoals het gebruik van 'evidence-based' checklists of richtlijnen. Hierdoor blijven veel problemen rondom het ziekenhuisontslag liggen en worden mogelijkheden tot verbetering over het hoofd gezien. De mate waarin zorgverleners, met name in het ziekenhuis, de overdracht van zorg waarderen en betrokken zijn bij het continueren van zorg in de eerste lijn is bepalend voor de kwaliteit van het ziekenhuisontslag.

Hoofdstuk 4 presenteert de resultaten van een kwalitatieve studie naar de percepties en ervaringen van zorgverleners, patiënten en naasten met patiëntgerichte zorg in het ontslagproces. Individuele en focus groep interviews werden geanalyseerd in vijf Europese Unie landen (zie hoofdstuk 3). Vier belangrijke thema's kwamen uit de analyse naar voren: 1) een standaard ontslaggesprek ontbreekt vaak als gevolg van tijdgebrek en een primaire focus van zorgverleners op het verlenen van optimale zorg; 2) patiënten worden niet structureel betrokken in het plannen van ontslag en organiseren van nazorg; 3) patiëntspecifieke wensen en behoeften worden onvoldoende herkend en onjuist ingeschat; en 4) externe factoren, zoals druk op het vrijmaken van bedden en wisselende aanwezigheid van zorgverleners in het ziekenhuis, belemmeren een patiëntgericht ontslag. De bevindingen in dit hoofdstuk geven aan dat de wensen en behoeften van de patiënt vaak niet voorop staan. De kwaliteit van het ontslagproces wordt beïnvloed door de mate waarin zorgverleners, gedreven door professionele overtuigingen en door organisatiefactoren die buiten de directe invloed van de zorgverlener liggen, rekening houden met patiëntspecifieke wensen en behoeften.

In **hoofdstuk 5** worden de percepties van patiënten op hun participatie in de overdracht van en naar het ziekenhuis bestudeerd. Een secundaire analyse van data afkomstig uit drie onderzoeksrapporten waarin de percepties van patiënten en hun betrokken zorgverleners met de overdracht van zorg centraal stonden is uitgevoerd. De rapporten zijn gebaseerd op individuele interviews en focus groep interviews, die met 90 patiënten werden gehouden in vijf Europese Unie landen (zie hoofdstuk 3). De positie van de patiënt en zijn of haar inbreng in de overdracht van zorg varieerde van: de patiënt als bepalende actor, het delen van verantwoordelijkheden met de zorgverlener en de patiënt als passieve participant. Patiënten zagen hun zorgverleners het liefst als bepalende actor in de overdracht of hadden een voorkeur voor een eigen actieve rol zodat ze een gevoel van controle hadden. Daarnaast gaven zij het belang van duidelijkheid over de verdeling van verantwoordelijkheden tussen patiënten en zorgverleners aan, teneinde misverstanden in het uitvoeren van overdrachtstaken te voorkomen. Concluderend kan worden gezegd dat zorgverleners bewuster moeten afwegen en overleggen met patiënten in welke mate patiënten en naasten een actieve rol in het ontslagproces willen en kunnen opnemen.

Hoofdstuk 6 beschrijft een systematisch literatuuronderzoek naar interventies die zich richten op het verbeteren van de overdracht van zorg van de tweede naar de eerste lijn. Zesendertig gerandomiseerde studies met een controle groep voldeden aan alle inclusiecriteria en werden geëvalueerd op: de kenmerken van de interventie, de gebruikte uitkomstmaten en gevonden effecten, de setting en de methodologische kwaliteit van de studie. Vijfentwintig van de 36 studies hadden één of meer significante effecten ten faveure van de interventiegroep. Vrijwel alle studies beschreven een interventiebundel bestaande uit diverse activiteiten, personen en/of materialen. Kenmerken van effectieve interventies waren: medicatieverificatie, elektronische hulpmiddelen voor het tijdig schrijven van een duidelijke ontslagbrief, ontslagplanning, betrokkenheid van zowel eerste- en tweedelijns zorgverleners in de follow-up na ontslag, het gebruik van elektronische ontslagberichten naar huisartsen en (beveiligde) toegang voor huisartsen naar relevante informatie gerelateerd aan de zojuist ontslagen patiënt. Statistisch significante effecten werden voornamelijk gevonden in: een reductie van ziekenhuis heropnames, een verbetering van de continuïteit van zorg (bijvoorbeeld de accuraatheid van informatie gerelateerd aan ontslag) en een verbetering van de fysieke of sociaal-emotionele toestand van de patiënt. Verrassend genoeg beschreven maar drie studies interventies met de intentie om het gedrag van zorgverleners te beïnvloeden. Dit terwijl uit eerdere hoofdstukken in dit proefschrift blijkt dat de attitude van de professional en de organisatiecultuur belangrijke factoren zijn, die de kwaliteit en veiligheid van ziekenhuisontslag beïnvloeden. De grote variatie in gebruikte en geschikte uitkomstmaten, populatieomvang en klinische setting, en de slechte beschrijving van het doel van de interventie en specifieke interventiecomponenten zijn belangrijke beperkingen in het trekken van verstrekkende conclusies over het effect van een interventie op de kwaliteit en veiligheid van ziekenhuisontslag.

Hoofdstuk 7 beschrijft de systematische en theoriegefundeerde ontwikkeling van een interventie programma om de overdracht van zorg bij ziekenhuisontslag te verbeteren. Hierbij is gebruik gemaakt van Intervention Mapping (IM), wat bestaat uit zes opeenvolgende stappen. In de eerste stap werd een uitgebreide probleemanalyse uitgevoerd naar de omvang, oorzaken en consequenties van ineffectief ziekenhuisontslag. In stap 2, werd gespecificeerd wat er zou moeten worden verbeterd als gevolg van een interventie programma, en wie en wat moet worden veranderd als gevolg van het programma. In stap 3 werden op basis van de vastgestelde doelen en de gevonden determinanten theoretische methoden en praktische strategieën gekozen om de beoogde veranderingen te kunnen realiseren. In stap 4 werd een overzicht van methoden en bijpassende verbeterstrategieën gepresenteerd waarbij de strategieën werden ingeschaald op hun bewezen effect. In stap 5 en 6 werden suggesties gedaan voor het implementeren en evalueren van een interventie programma. Uit de probleemanalyse bleek dat een interventie programma zich bij voorkeur zou moeten richten op het veranderen van het gedrag van zorgverleners en patiënten, en de organisatie en technische aspecten die bijdragen aan een suboptimaal ontslag. Stap 2, 3 en 4 leidden tot de keuze van verschillende methoden afkomstig uit organisatie- en gedragstheorieën (bijvoorbeeld "consciousness raising" en "guided practice") en praktische strategieën (bijvoorbeeld het gebruik van een gestandaardiseerde elektronische ontslagbrief, visuele herinneringen en waarschuwingen aan zorgverleners om een ontslagbrief tijdig te versturen en het laten navertellen of demonstreren van ontslaginstructies door patiënten vlak voor ontslag). De resultaten van dit hoofdstuk kunnen zorgverleners en beleidsmakers helpen in het maken van een plan van aanpak om het ontslagproces te verbeteren en bieden richting in het ontwikkelen van interventies die zijn ingericht op het verbeteren het ziekenhuisontslag in de lokale setting.

In **hoofdstuk 8**, het laatste hoofdstuk van dit proefschrift, worden de belangrijkste bevindingen uit de voorgaande hoofdstukken bediscussieerd. De resultaten worden in een groter perspectief geplaatst en vergeleken met andere studies. De meest relevante methodologische beperkingen worden besproken, praktische implicaties worden gepresenteerd en er worden aanbevelingen gedaan voor verder onderzoek.

Tot slot kan worden geconcludeerd, dat meer *zorg voor* de overdracht van zorg nodig is om de kwaliteit en veiligheid van ziekenhuisontslag te verbeteren. Toekomstige interventies moeten zich focussen op het verbeteren van: a) de kennis over en verstandhouding tussen eerste- en tweedelijns zorgverleners; b) de waardering van en toewijding aan administratieve taken gerelateerd aan de overdracht van zorg door zorgverleners; c) een structurele reflectie op het handelen tijdens het ontslagproces door zorgverleners; d) patiëntgerichtheid van zorgverleners; en e) de bewustwording bij patiënten van de belangrijke rol, die zij met hun kennis en thuismogelijkheden in het ontslagproces kunnen spelen.

Dankwoord

Ziezo, het proefschrift is af! Na jaren van data verzamelen, analyseren en schrijven is het nu eindelijk zover om terug te blikken op een geweldig leuke en leerzame periode. Zoals iedere promovendus die een dankwoord mag schrijven, kom ik tot de conclusie dat deze promotie niet mogelijk was geweest zonder de hulp van een groot aantal mensen. Jullie wil ik via deze weg allemaal hartelijk danken.

Om te beginnen mijn promotor, Myrra Vernooij-Dassen, en mijn twee copromotoren, Hub Wollersheim en Lisette Schoonhoven. Dankzij jullie kon ik promoveren op een zeer interessant en belangrijk onderdeel van het zorgproces, heb ik kunnen werken in een internationale setting en had ik ineens een hele goede reden om terug te keren naar de mooiste stad van Nederland: Nijmegen! Ontzettend bedankt voor jullie steun en interesse in allerlei opzichten, en jullie tijd en moeite om dit project tot een succesvol einde te brengen.

Myrra, je hebt me erg vrijgelaten zonder het gevoel te hebben er alleen voor te staan. Je liet me mijn eigen weg bewandelen en ontdekken hoe ik het onderzoek aan moest pakken. In geval van nood, wist je mij altijd perfect te linken aan goede hulptroepen zodat ik weer verder kon met analyseren of schrijven. Jouw inhoudelijke en persoonlijke begeleiding en je 'drive' voor perfectie (ook wanneer ik pas achteraf het nut ervan in zag) heb ik als zeer prettig ervaren. Je maakte mijn artikelen beter door steeds te blijven vragen: wat is je boodschap en wat is de rode draad? Het 'kill your darlings' principe is mij nu zeer bekend! Je hebt mij gestimuleerd om mijn onderzoeksvaardigheden verder te ontwikkelen en mijn ervaringen, in het bijzonder met kwalitatief onderzoek, te delen met anderen. Dit heeft mijn affiniteit met kwalitatief onderzoek alleen maar verder vergroot! Bedankt voor jouw daadkracht en doortastend optreden wanneer dat nodig was.

Hub, ik zie jou naast copromotor ook als mentor. In de dagelijkse begeleiding waren jouw snelle en toch uitgebreide feedback, het vertrouwen in mijn zelfstandigheid en jouw oog voor detail onmisbaar. Ondanks je drukke agenda stond en staat je deur altijd open voor al mijn – soms zeer praktische, maar prangende – vragen en verzoeken om advies. Ik heb veel gehad aan je pragmatische en tactische aanpak en stond vaak perplex van je simpele oplossingen voor ogenschijnlijk complexe problemen. Je hebt me geleerd om meer 'to-the-point' te komen en me niet te veel zorgen te maken over zaken, waar ik toch geen controle over heb of die er (nog) niet toe doen. Daar ga ik ook in de toekomst veel profijt van hebben! Jij leerde mij de kunst van het beknopt schrijven en wollig taalgebruik vermijden (hoewel mij dit nog steeds niet onbekend is). Daarnaast ben ik je zeer dankbaar voor de mogelijkheden, die jij hebt gecreëerd zodat ik mij na het promotietraject als onderzoeker verder kan ontplooien.

Lisette, je was voor mij een ideale copromotor. Ik vond het altijd fijn om bij jou aan tafel te schuiven. Zelfs de terugkomende problemen met de Outlook Agenda (of was het nu puur mijn onhandigheid...) weerhield ons er niet van om periodiek te overleggen. Ik waardeer je enorm om jouw zeer snelle, gedetailleerde, kritische maar altijd constructieve feedback. Je had altijd je antwoord klaar en er werden knopen doorgehakt. Na een afspraak met jou had ik altijd het gevoel dat ik weer grote stappen kon maken. Daarnaast kon ik altijd erg fijn met je praten; je had altijd een luisterend oor, interesse voor zaken naast het werk en...goede koffie. Dank je wel daarvoor! In het bijzonder, herinner ik mij je enthousiasme en bereidheid om jouw eigen werk te presenteren bij het afscheidscollege van mijn vader op het Saxion in Enschede. Dit heb ik, net als de rest van mijn familie, enorm gewaardeerd!

Voor de resultaten van de onderzoeken in dit proefschrift zijn honderden zorgverleners, patiënten en naasten uit verschillende landen in Europa bereid geweest om deel te nemen aan interviews, het vragenlijstonderzoek of andere tijdrovende zaken. Zonder hun deelname en kwetsbare opstelling, onder andere door kritisch te reflecteren op hun eigen handelen, zou dit proefschrift er niet zijn geweest.

Dear colleagues and friends of the HANDOVER research collaborative, it was a privilege and great pleasure to work with you all on this challenging subject: how to improve patient handovers in the hospital and primary care interface. It is a great feeling to have been part of a team that conducted this large qualitative study across five countries and to overcome its inherent methodological and practical challenges by working constantly in good spirits. I cherish the wonderful memories on both the scientific and social part. Many thanks to all of you for your contribution to this thesis in one way or another! Special thanks go out to the following persons.

Petra, wat hadden wij vanaf het begin een goede klik als de twee Nederlandse promovendi op het HANDOVER project. Terugkijkend op de periode van datacollectie kun je wel stellen dat we een vliegende start hebben gemaakt. Wat vond ik het dan ook jammer toen duidelijk werd dat je, om begrijpelijke redenen, besloot te stoppen en de draad als huisarts weer op te pakken. Zonder jouw enthousiasme, doorzettingsvermogen en inhoudelijke bijdrage was dit proefschrift niet tot stand gekomen. Dit is ook jouw verdienste en ik hoop dat je er net zo trots op bent als ik.

Loes, bedankt voor jouw coördinerende rol vanuit Utrecht, vooral ten tijde van de datacollectie en analyse in het begin van mijn promotietraject. Als relatief nieuwkomertje, ben ik mij gedurende het project steeds meer gaan realiseren hoe belangrijk jij voor HANDOVER, en dus ook voor mijn promotieonderzoek, bent geweest. Je was een kei in het bewaken van de continuïteit door bij iedereen steeds maar te blijven hameren op de naderende deadlines, ook als dit weerstand (ook bij mij) opriep.

Paul, thank you for your great and extensive scientific input, advices and textual suggestions for improvement on many, many occasions, which definitely lifted the articles up to a higher quality level. I appreciate your catching enthusiasm, the doors you opened to disseminate our scientific work and your confidence in me throughout these last years.

Dear Maria, sparring PhD partner from Stockholm, I greatly enjoyed working with you in the HANDOVER project and particularly our close collaboration on chapter 4 and 5. Thank you for having me in Stockholm to write these articles; it was a great success, and definitely facilitated by the hospitality of you and the rest of the Swedish team. Apart from the great work we did, for me it was a nice experience to visit Stockholm just before Christmas time and to take part in the local traditions! I'd also like to thank Carola, Giulio, Ewa, for the nice and relaxed way of collaborating on the various articles. I admire your hard work, dedication (also after the project formally ended) and your important contributions to this thesis. I enjoyed our scientific discussions and social chats via e-mail, Skype or face-to-face at the numerous project meetings throughout Europe.

Plezier hebben in je werk is gedeeltelijk afhankelijk van je werkomgeving. Een goede sfeer op de werkvloer is essentieel en daarmee heb ik het getroffen bij IQ healthcare. Ik wil een aantal collega's in het bijzonder benoemen. Marieke, hoewel je pas halverwege betrokken raakte bij het HANDOVER project, heb jij in mijn promotietraject een belangrijke rol gespeeld door je grote bijdrage in het meeschrijven aan de HANDOVER rapporten en hoofdstuk 7. Ik heb veel gehad aan je praktische tips, luisterend oor en jouw motivatie om door te pakken met het afronden van het proefschrift. Bedankt ook voor de vele gezellige gesprekken, het slappe geouwehoer en alle tips en waarschuwingen voor een prille vader van een ervaren moeder. Janine en Anouk, bedankt voor jullie goede hulp en gezelschap bij het zoeken, selecteren en analyseren van studies voor het literatuuronderzoek. Marianne, het organiseren van de CaRe cursus 'Introductie in kwalitatief onderzoek in de gezondheidszorg' is een wederzijds genoegen. Ik hoop dat er nog vele zullen volgen. Intervisie collega's Anke, Irene, Geertje, Nicole, Carola en niet te vergeten Enya: bedankt voor de altijd leerzame en fijne intervisie bijeenkomsten. Jullie openheid en interesse hebben voor mij aangetoond, dat promovendi veel van elkaar kunnen leren en intervisie er zou moeten zijn voor elke promovendus. Arna en Nancy, bedankt voor jullie adviezen, het delen van statistische en taalkundige kennis, gezelligheid en jullie interesse en geduld in het aanhoren van al mijn verhalen over mijn onderzoek en het naderende vaderschap. Jeannette, Alice, Annick, Daniëlle, Myriam, Jolanda en alle anderen: bedankt voor alle secretariële ondersteuning, het geregel, het maken van afspraken (zeker wanneer ik weer eens het onmogelijke op korte termijn vroeg) en de gezellige praatjes zo even tussendoor. Jolanda, je hebt mij een boel werk bespaard door in korte tijd en op nette wijze de lay-out van dit proefschrift op je te nemen. Voor iemand, die vrij onhandig is met dat soort zaken, was dat ongelofelijk fijn!

Dit proefschrift en de wijze waarop ik er aan heb gewerkt is grotendeels ook bepaald door de mensen buiten mijn werksfeer. Allereerst de vrienden. Bas, Daan, Edson, Henk Jan, Jos, Koen en Marco. Bedankt voor de jarenlange vriendschap. Ik geniet altijd enorm wanneer we samen zijn. De snowboardvakanties, weekenden weg, etentjes en de vele avonden in de kroeg waren en zijn nog steeds een welkome afleiding. Bas, ik kijk met veel plezier terug op onze dagelijkse lunches en fietstripjes ☺. Rien, Joris-Jan en Jitse, helemaal sinds mijn komst naar Nijmegen zijn we goede vrienden geworden. Ik hoop dat we onder andere nog veel gezellige Champions League avonden zullen beleven in de pub! Visca el Barca!

Mijn schoonouders: Jan en Loes, ik heb het erg getroffen met jullie. Vanaf het allereerste moment heb ik mij bij jullie ontzettend welkom gevoeld. Ik wil jullie graag bedanken voor alle warmte, betrokkenheid en gezelligheid in de afgelopen jaren. (Schoon) broers en (schoon) zussen: Jasper, Sanne, Anne, Karlijn, Terrence en Ted, bedankt voor jullie interesse in hetgeen waar ik mij de afgelopen jaren mee heb bezig gehouden. Bart en Marieke, jullie broertje is dan nu toch echt klaar met z'n 'studie' hoor! Ik vond het leuk en fijn om met jullie als ervaren zorgverleners te discussiëren over een onderwerp dat erg herkenbaar voor jullie was. Ik prijs me gelukkig met jullie als behulpzame broer en zus en bewonder jullie zorgzaamheid als ouders voor Teun, Charlotte, Femke en Nienke.

Lieve pap en mam, dankzij jullie heb ik een hele fijne en onbezorgde jeugd gehad en werd er in Hengelo een goede basis gelegd voor mijn verdere leven. Zonder jullie onvoorwaardelijke steun in al mijn keuzes, stimulans om het beste uit mijzelf te halen en het geloof in mijn kunnen was ik niet waar ik nu ben. Ik heb veel bewondering voor jullie kracht en doorzettingsvermogen gedurende de afgelopen zware jaren. Ik draag dit proefschrift dan ook aan jullie op. Ik ben er trots op jullie zoon te zijn en hoop het bij Siem net zo goed te doen als jullie bij mij.

Lieve Siem, ik kan niet zeggen dat je mij veel hebt gesteund of inhoudelijk hebt bijgedragen aan dit proefschrift. Je komst was echter wel een geweldige motivatie om op te schieten met mijn onderzoek. Je aanwezigheid nu heeft mij ook geleerd mijn werkzaamheden te kunnen relativeren. Ik geniet intens van jouw altijd vrolijke blik in de vroege ochtend en de rappe ontwikkeling die jij nu doormaakt. Je hebt mijn leven enorm verrijkt en ik kijk uit naar de vele mooie momenten die met jou en mama nog zullen komen. Blijf voor altijd zo'n vrolijk mannetje!

Lieve, Marieke, lieve 'Miep', wat ben ik gelukkig met jou. Bedankt voor het delen van lief en leed, en ook heel veel lol, in de afgelopen jaren waarin we best veel hebben meegemaakt. Je steun, geduld, begrip en de stapjes die jij extra deed op de momenten waarop ik mijn promotiewerk letterlijk en figuurlijk mee naar huis nam, waren onmisbaar. Je bent een geweldige moeder en vriendin. Siem is de ultieme bekroning op het moois dat we hebben en hopelijk nog lang mogen houden. Ik hou van jullie!

Curriculum Vitae

Gijs Hesselink werd op 22 december 1982 geboren te Hengelo als zoon van Gerard en Luciënne Hesselink. In 2001 behaalde hij zijn Atheneum diploma aan de Scholengemeenschap de Grundel te Hengelo (Overijssel).

Na de middelbare school volgde hij voor een half jaar de opleiding Technische Bedrijfskunde aan de Universiteit Twente om vervolgens over te stappen naar de bacheloropleiding Bestuurskunde aan de Radboud Universiteit Nijmegen. Zijn bachelor thesis, een onderzoek naar de knelpunten bij grensoverschrijdende traumazorg in de Euregio, vormde de eerste stap in het wetenschappelijk onderzoek naar kwaliteitsvraagstukken in de gezondheidszorg. Na het behalen van zijn bachelordiploma in 2006 volgde hij de masteropleiding Organisatie, Cultuur en Management aan de Universiteit Utrecht, welke in 2007 werd afgerond. Zijn afstudeeropdracht betrof een kwalitatieve studie naar de rol van organisatiecultuur rondom de invoering van zorglogistieke principes in revalidatiecentrum 'het Roessingh' in Enschede. In 2008 rondde hij zijn tweede masteropleiding, Gezondheidswetenschappen, aan de Universiteit Twente af. Zijn afstudeeronderzoek verrichtte hij, in opdracht van de 'Organisation of European Cancer Institutes (OECI)' bij het Nederlands Kanker Instituut – Antoni van Leeuwenhoek ziekenhuis (NKI-AVL). Het onderzoek betrof een inventarisatie van de belangrijkste eigenschappen en de belemmerende en bevorderende factoren bij het ontwikkelen van een Europees classificatiesysteem voor kankerinstituten. Zijn thesis bestond verder uit een uiteenzetting van de belangrijkste eigenschappen waaraan dit classificatiesysteem zou moeten voldoen. In zijn thesis gaf hij tevens een eerste aanzet voor een dergelijk systeem.

In 2009 begon Gijs, in het kader van een grote Europese studie naar de overdracht van zorg tussen de eerste en tweede lijn (HANDOVER), aan een promotietraject bij het Scientific Institute for Quality of Healthcare (IQ healthcare). In 2013 werd het promotieonderzoek, waarvan in dit proefschrift de resultaten worden gepresenteerd, afgerond. Naast zijn promotieonderzoek schreef hij verschillende projectrapporten voor de Europese Commissie, was hij betrokken bij verschillende andere onderzoeken en is hij als docent betrokken bij de jaarlijkse CaRe cursus 'Introductie in kwalitatief onderzoek in de gezondheidszorg'. Sinds september 2012 is hij werkzaam bij IQ healthcare als post-doc op verschillende projecten.

Gijs woont in Nijmegen samen met Marieke Hanekamp. Samen zijn ze de trotse ouders van Siem.

Bibliography

Scientific publications

- Hesselink G, Schoonhoven L, Barach P, Spijker A, Gademan P, Kalkman C, Liefers J, Vernooij-Dassen M, Wollersheim H. Improving patient handovers from hospital to primary care. A systematic review. Annals of Internal Medicine 2012;157:417-28.
- Hesselink G, Flink M, Olsson M, Barach P, Dudzik-Urbaniak E, Orrego C, Toccafondi G, Kalkman C, Johnson JK, Schoonhoven L, Vernooij-Dassen M, Wollersheim H, the European HANDOVER Research Collaborative. Are patients discharged with care? A qualitative study of perceptions and experiences of patients, relatives and care providers. BMJ Quality & Safety 2012;21:i39-49.
- Hesselink G, Schoonhoven L, Plas M, Wollersheim H, Vernooij-Dassen M. Quality and safety of hospital discharge: a study on experiences and perceptions of patients, relatives and care providers. International Journal for Quality in Health Care 2013;25(1):66-74.
- Hesselink G, Vernooij-Dassen M, Pijnenborg L, Barach P, Gademan P, Dudzik-Urbaniak E, Flink M, Orrego C, Toccafondi G, Johnson JK, Schoonhoven L, Wollersheim H, the European HANDOVER Research Collaborative. Organizational culture: an important context for addressing and improving hospital to community patient discharge. Medical Care 2013;51(1):90-98.
- Hesselink G, Zegers M, Vernooij-Dassen M, Barach P, Kalkman C, Flink M, Öhlén G, Olsson M, Bergenbrant Susanne, Orrego C, Suñol R, Toccafondi G, Venneri F, Dudzik-Urbaniak E, Kutryba B, Schoonhoven L, Wollersheim H, the European HANDOVER Research Collaborative. Developing a tailored hospital discharge intervention program by using the Intervention Mapping framework. Submitted 2013.
- Flink M, Hesselink G, Pijnenborg L, et al. The key actor: a qualitative study of patient participation in the handover process. BMJ Quality & Safety 2012;21:i89-i96.
- Göbel B, Zwart D, Hesselink G, et al. Stakeholder perspectives on patient handovers between general practitioners and hospital staff: A qualitative evaluation using a microsystem lens. BMJ Quality & Safety 2012;21(Suppl 1):i106-13.
- Johnson JK, Farnan J, Barnach P, Hesselink G, et al. Searching for the missing pieces between the hospital and primary care: mapping the patient process during care transitions. BMJ Quality & Safety 2012;21(Suppl 1):i97-i105.

Professional publications

- Hesselink G, Schoonhoven L, Vernooij-Dassen M, Wollersheim H. Worden patiënten met zorg ontslagen? Een kwalitatief onderzoek naar de percepties van patiënten, naasten en zorgverleners. Nederlands Tijdschrift voor Geneeskunde. Accepted for publication.
- Hesselink G, Wollersheim H. Verbetering van ziekenhuisontslag. KiZ Kwaliteit in Zorg, november 2012.

- Hesselink G, van Dijk R, Straathof A, Wollersheim H. Organisatiecultuur: een belangrijke barrière bij kwaliteitsverbetering. KiZ Kwaliteit in Zorg, november 2011.

Reports

- Hesselink G, Wollersheim H, Barach P, Schoonhoven L, Vernooij-Dassen M. Report on challenges in patient care and the factors that influence change in practice. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2010.
- Hesselink G, Zegers M, Schoonhoven L, Vernooij-Dassen M, Wollersheim H. Report on mechanisms and processes responsible for the implementation results and their variation within target groups. Utrecht, The Netherlands: Utrecht Medical Center, for the European Union, 2010.