Project Deliverable Report

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When a patient’s transition from the hospital to home is less than optimal, the repercussions can be far-reaching — hospital readmission, an adverse medical event, and even mortality. Project HANDOVER, is the first major European study to assess patient transitions. The goal of the study is to identify and study patient handover practices and create standardized approaches to handover communications in 6 European countries (i.e., Sweden, Poland, England, Italy, Spain, Netherlands).

The policy objective of the HANDOVER project was to assess the continuum of clinical care at the primary care hospital interface by informing EU healthcare policy makers and educators about patient transitions. The project HANDOVER developed a standardized toolkit for improving the handoff processes, that can be tailored to meet local and/or institutional needs. The study included a total of 12 hospitals, and has collected data from hundreds of physicians, nurses, patients and hospital managers.

The project aimed to improve patient care in EU member states and in relation to patient mobility and cross border care among European countries. A major outcome of the research was a deeper understanding of how variations in communication, culture, and technology use in nursing and medicine leads to ineffective or suboptimal handoffs.

The discontinuity and variation of care across these EU settings leads to increased handovers poses danger to patients. The handovers we explored and studied are often characterized by communication failures, environmental barriers and adverse care.

The study was a multi-method study (i.e., process maps, surveys, interviews, focus groups, observations) to directly assess patient handovers and shadow physicians and nurses providing care following patient handovers. Our aims were to: (1) Identify the barriers and facilitators in the medical, social and technological contexts where patient handovers takes place; (2) Determine how variations in handoff processes lead to "near misses" and adverse outcomes; (3) Develop and assess tools and training programmes that are needed for implementation of a handoff training program; and, (4) Assess the cost effectiveness of future handover interventions.

We mapped out the patient care handover processes in the different countries (process maps, artefact analysis), developed standardized tools to conduct interviews, focus groups, artefact analyses and develop a shared taxonomy of near miss and adverse patient events.

We interviewed over 192 healthcare providers, and discovered that important and intricate relationships exist among the people, processes, technology, and clinical settings in which handovers occur. Significant differences were seen in the patient discharge, transfer, and rehabilitation processes in each of the 6 countries. We found great variation in practice and a lack of systems appreciation. These relationships have the potential to facilitate or impede the hand-off process and directly impact patient outcomes.
We focused the 2nd part of the study on developing a series of interventions including clinical practice guidelines, best practice indicators and an educational toolbox for under- and postgraduate healthcare trainees. During the second period of the project we continued our work on identification and validation of factors that would constitute the optimal patient care system continuum, and training tools to assist a successful implementation.

The lack of awareness of different professional perspectives, inherent to primary and secondary professional domains, seems to influence the roles and responsibilities in patient diagnosis and treatment. Though most professionals think they carry a shared responsibility in this respect, in practice they do not. Because of multiple assigned roles and unclear responsibilities, especially for nursing professionals, discharge can create barriers in handover as well. We demonstrated that it is common for the general practitioner to play an essential part in the coordination of patient care. Multiple factors, such as the lack of direct contact between professionals, involvement of multiple professionals and the lack of feedback, make it difficult for the general practitioner to fulfil this role excellently and be accountable.

We found that current interventions aimed at improving patient handovers at the hospital-primary care interface fall short in addressing the barriers and facilitators. Effective patient handovers at the hospital-primary care interface are influenced by a large variety of barriers and facilitators. However, effective handover interventions are mostly aimed at improving organizational and technical aspects of the handover process.

The HANDOVER website www.handover.eu was developed with the support and involvement of the whole HANDOVER project team. The site presents the functionalities that were requested by and expected of the group and provides a compendium of information on handover, both in Europe and globally. Information is available in English but also in the native languages of project partners.

The Handover Toolbox www.handover.ou.nl is an interactive platform and a compendium of knowledge about education and training in handovers as well as a library of practices, tools and techniques related to patient handovers. The interactivity of the handover network facilitates the sharing of experiences and practices in handovers. The added value of the toolbox is to emphasize the importance of handovers in the process of care and the significance of education in the field.

**Keywords** Handover, patient safety, results, impact, dissemination, quality improvement
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Chapter 1 Objectives and achievements

1.1 Introduction

The HANDOVER team created an international community of practice which has led to two successful follow-up grant applications, multiple scientific publications, two ongoing PhD studies and a capacity to do further and more complex health service research. Furthermore, project management developed several knowledge management tools that helped build trust, collaborative spirit and sustained engagement.

Overview of project objectives for the reporting period

In Annex I of the Grant Agreement the objectives for the project are specified per workpackage. In the table below is an overview of the project and workpackages, including the progress denoted in the last column. All the project objectives and deadlines were met. Asterisks denote work reviewed under Periodic Report #1.

In addition to the work presented in Periodic Report 1 we have reviewed the work of WP2, 3 and 4 in this report and revisited the methods and findings throughout the latter 18 months of the study. We feel that seeing all of the WP products, methods, and data together helps understand the complete oeuvre of the HANDOVER project.

<table>
<thead>
<tr>
<th>WP and active time periods</th>
<th>Objectives</th>
<th>Achieve</th>
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<tbody>
<tr>
<td>WP2 (10-2008 till 9-2011)</td>
<td>Identify barriers and facilitators in different European settings of effective handovers in the social, linguistic and technological contexts in which they take place.</td>
<td>Yes*</td>
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<tr>
<td>WP3 (4-2010 till 9-2011)</td>
<td>1. Determine how variations in handover processes lead to “near misses” and adverse outcomes; 2. Identify standardized elements for communication, that can be used as a general tool in handover processes throughout Europe</td>
<td>Yes*</td>
</tr>
<tr>
<td>WP4 (10-2008 till 10-2011)</td>
<td>1. Identify and validate factors determining the success of integrating optimal patient care micro-system continuum; 2. Develop training tools to assist a successful implementation of communication model.</td>
<td>Yes*</td>
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<tr>
<td>WP5 (6-2009 till 10-2011)</td>
<td>Assess the patient safety culture in the interface between hospital and primary care.</td>
<td>Yes</td>
</tr>
<tr>
<td>WP6 (10-2008 till 10-2011)</td>
<td>Assess the impact of the model and training modules in different settings.</td>
<td>Yes</td>
</tr>
<tr>
<td>WP7 (10-2008 till 10-2011)</td>
<td>1. Widely disseminate the work of HANDOVER 2. Reach consensus among experts on tools to improve handovers in clinical care 3. Foster adoption of safe and effective practice, based on the findings of participating units, by stakeholders and the public.</td>
<td>Yes</td>
</tr>
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1.2 Workpackage 2: Assessment of handovers between different microsystems at the primary care / hospital interface

Workpackage leader: Karolinska University Hospital, Sweden

Objectives
The aim of this WP was to identify barriers and facilitators of effective handovers in the social, linguistic and technological contexts in which they take place in different European settings.

Description
In pursuit of this aim the following activities were performed:
• Recruited key stakeholder groups in Sweden, Poland, Spain, Italy and The Netherlands;
• Conducted individual and focus group interviews in the different stakeholder groups and preliminary analyzes of these data;
• Developed process maps, ishikawa diagrams and artefacts analyses; and,
• Assessed different tools used in communication and treatment and their effect on the communication process (artefact analyses).

Deliverables
D3 Report on the barriers and facilitators to effective handovers in the social, linguistic and technological contexts in which they take place in different European settings (month 18).

Summary
The activities of WP2 created an important empirical base for continued work in the HANDOVER project and for other EU communication projects. A prospective, qualitative study was designed and the five participating countries conducted 314 individual interviews with stakeholders as well as 24 focus group sessions with altogether 142 participants, one process map and one artefact analysis per country.

The prevailing handover practices differ widely between countries. Chronically ill patients and their healthcare providers (e.g. physicians and nurses in hospital and primary care) contributed rich descriptions of their experiences and perceptions of handovers between the clinical microsystems. These experiences were framed and interpreted in their respective social, linguistic and technological context.

The analysis performed on the available interviews in WP2 and reported in Deliverable D3, is further corroborated by analyses of process maps and artefacts. Maintaining accuracy and quality according to this plan was a continual, dynamic process that continued throughout the project and all its workpackages. The quality assurance review resulted in compliance with agreed methods and protocols and data having been recorded, analyzed and accurately reported according to the study protocol.

The findings help understand the context in which chronically ill patients and their care providers interact in Europe, even if the diversity of settings and languages make drawing comparisons and recommendations for action complicated.
Significant results

The study identified several important barriers and facilitators to effective patient handover practices, common as well as context-specific. The empirical research performed in WP2 allowed us to further analyze cultural aspects, error risks and adverse events to better understand how patient handovers can be improved. We tailored our interventions to address the identified barriers and incorporate the identified facilitators. Future interventions are likely to be multi-layered and multi-sectoral, ranging from the individual clinician and clinical level, with a special focus on the microsystems and organizational levels.

Reasons for failing to achieve critical objectives
All critical objectives for WP2 were met.
1.3 Workpackage 3: Identify basic elements of effective communication

Workpackage leader: University Medical Centre Utrecht (UMCU), The Netherlands

Objectives
The objectives of this workpackage were to:

1. Determine how variations in handover processes lead to “near misses” and adverse outcomes; and,
2. Identify standardized elements of communication that can be used as a general tool in handover processes throughout Europe.

Description
The workpackage comprised the following activities:

- Analyses of data: Focus group and interview data of WP2 were further analyzed to identify barriers and facilitators of effective communication;
- Identifying standardized elements for communication: With focus group and interview data a cause and effect model was constructed (using the Ishikawa method), specifically exploring the roles of place, procedures, people, and policies as barriers or facilitators to effective communication;
- Defining roles and responsibilities of stakeholders in the handover process; and,
- Process analyses: a process map analysis was conducted with a focus on improvement, with the aim of identifying inefficiencies, removing obvious redundancies or complexities and facilitating and aligning goals.

Deliverables
D5: Project Deliverable Report: Identify Basic Elements of Effective Communication (Month 24).

Summary
The aims of this Deliverable were to (a) identify referral and discharge barriers and facilitators to effective and safe patient handovers; (b) determine how variations in handover processes lead to “near misses” and adverse outcomes; and (c) explore the roles and responsibilities of healthcare providers as well as patients and their families.

We conducted a prospective, qualitative study in The Netherlands, Spain, Poland, Italy and Sweden. Patients with chronic diseases and their respective care providers were recruited for individual and focus group interviews, after being discharged from hospital.

The idea of developing a single approach for all handovers was discarded due to the diversity and complexity of national and international healthcare systems. HANDOVER, and particularly workpackage 3, therefore aimed to provide common elements for efficient communication that can be tailored to meet individual, institutional and/or regional requirements.

Workpackage 3 determined the effectiveness and efficiency of various methods and models for integrating and sustaining best practices in improving care processes and patient outcomes. The triangulation of multi modal improvement science methods in this study, such as Ishikawa diagrams, interviews, process mapping, artefact analyses, etc, with a focus on near misses, roles and responsibilities and barriers and facilitators, is innovative and facilitated cross-country learning.
We found that while the prevailing handover practices differ across Europe, many of the identified referral and discharge barriers and facilitators appear to be similar in the different countries and settings.

**Significant results**

**Identify barriers and facilitators to effective communication**

Researchers in each country performed a qualitative analysis of the interview sample using themes agreed upon in preliminary analysis. The key themes that emerged included: communication, content, process & tools, attitudes, organizational factors, community resources, patient awareness and patient empowerment. Local results were analyzed, shared, compared and summarized directed at the referral barriers and facilitators to effective communication. A selection of examples of handover practice and quotations can be found in Deliverable 5.

**Identify standardized elements for communication using Ishikawa**

Appendix D of Deliverable 5 contains two Ishikawa diagrams for each country – one showing facilitators to effective communication and one showing barriers. Each diagram considers barriers and facilitators as related to five categories: place, procedures, people (patients and providers) and policies. For example, the Ishikawa diagram for Poland lists numerous barriers to effective communication that are related to policies. A quick review of these barriers reveals some that are easier to address – such as “no training policy” – and some that are more difficult to address – such as “payment system”. An Ishikawa diagram can be used in this way to identify local improvement opportunities by making it visual.

**Defining roles and responsibilities**

All stakeholders, including the patients, agreed that there was a need for an active patient role for successful and safe handover processes. However, both patients and health professionals were concerned about the amount of responsibility to be transferred to patients. Family members are perceived to be of great importance in facilitating effective patient handovers, both by patients and professionals.

The lack of awareness of different professional perspectives, inherent to primary and secondary professional domains, seems to influence the roles and responsibilities in patient diagnosis and treatment. Though most professionals think they carry a shared responsibility in this respect, in practice they do not. Discharge can create barriers in handover as well due to the multiple assigned roles and unclear responsibilities, especially for nursing professionals.

We demonstrated that it is common for general practitioners to play an essential part in the coordination of patient care. Multiple factors, such as the lack of direct contact between professionals, involvement of multiple professionals and the lack of feedback, make it difficult for the general practitioner to fulfil this role effectively while being accountable.

**Process map analysis**

The goal for creating process maps was to visualize inefficiencies and remove obvious redundancies or complexities. Essentially the maps become part of the improvement strategy, with data from each part of the project analyzed using an iterative process. Each country reviewed their process map and developed a list of codes. Conference calls were held to reach consensus on the codes. The final codebook is included in Tables 9 and 10 of D5.
Identification of near misses and adverse outcomes in the handover process
Each country analyzed their interview and focus group data and identified possible root causes that led to suboptimal patient outcomes and near misses. The analysis identified a continuum of events that ranged from structure and process to patient outcomes using Avedis Donabedian’s conceptualization, to non routine events and from process failures, near misses and unsafe acts to adverse events, etc. Several common themes emerged that led to process failures and near misses, many acting as system barriers to good care and contributed to adverse patient events.

The common root causes include ineffective or lack of communication; lack of needed engagement from providers; lack of information, oversight of trainees, etc. A selection of near miss vignettes can be found in Deliverable 5.

Reasons for deviation from Grant
After extensive literature review and consensus within the Collaborative Project Group, we choose to use the term ‘handover’ instead of ‘handoff’ (as used in the Grant application).

Interviews and Focus Group and analysis (research objective 1-2 and WP2-3)

a) EU Question 1, 2012: When submitting D3, it was mentioned that the results presented were based on the analysis of half of the interviews and that the remaining interviews would be analysed in period 2. Could you please indicate if the analysis was conducted?

Comment: According to D5 (WP3) and D6 (WP5) 192 of the 321 individual interviews were analysed for these two deliverables. It was considered that with this large number of interviews the theme saturation was reached after 192 interviews both regarding communicative elements (D5) and regarding factors that influence change - culture of care (D6).

b) EU Question 2, 2012: The numbers of focus groups (FG) were divided by 2 compared to the number provided in the technical annex and only half of the FG interviews were analysed. Does this deviation have an impact on the quality of the results?

Comment: In the original plan the FG meetings were planned to include interviews as well as process mapping. In WP2, we however decided to use uni-professional FGs for interviews AND multi-professional and multi-setting groups specifically composed for the process mapping activities.

This procedure is also evident from the quality assurance report in D3 Appendix F. In D8 page 4 this is explained as a deviation from Grant: "Originally we aimed to conduct two focus groups in each stakeholder group and included process mapping in these exercises. Early in the planning of WP2, we decided that the process mapping would be better performed in the multi-professional group settings. Therefore, only one focus group interview in each stakeholder group and at least one process mapping exercise were conducted in each country".

Thus, we performed 26 FGs (with a total of 156 participants) and 11 process mapping groups (71 participants). The impact of these decisions according to our view has strengthened the results.

See D5 (WP3) page 17 and D6 (WP5) page 18, in which we describe in detail that all focus
group interviews were analysed and the results are reported in both these deliverables. The process maps as well are all analysed and contributed to the results of D3 and D5 (see pages 31 - 34 and appendix E).

c) EU Question 3, 2012: It is not clear from the deliverables and periodic report if an artefact analysis was conducted?

**Comment:** Artefact analyses were performed in all countries (see D3 page 27 and pages 48-49) about the detailed analysis steps and the results.

d) EU Question 4, 2012: Finally, could you please mention if the two tools I-SBAR and Five Ps were assessed as part of the development of a general model for communication?

**Comment:** The SBAR is a tool that the Handover project has assessed and recommended in the Toolbox (see the group for standardized tools to improve handover). It was not used as an analytic tool in any project analysis as it was not felt it would advance our data analysis.

Regarding the 5 Ps they are used within each of the Ishikawa-diagrams performed in all countries to analyse standardized elements of communication. See D5 pages 27 and Appendix D.

**Reasons for failing to achieve critical objectives**

All critical objectives for WP3 were met. However, future research might focus on examining the root causes of near misses further. Near misses were not part of the HANDOVER codebook and as such could not be analyzed in-depth.

The many process failures that emerged from the near miss analysis highlight the rich interplay between process, structure and outcomes and the realization that there is little difference in underlying causes between a near miss and an event that caused the patient (severe) harm, save for the recovery. This underscores the opportunities in studying near misses as an inexpensive and sensitive way to improve the system’s resilience.
1.4 Workpackage 4: Development of intervention training packages

Workpackage leader: Centre for Learning Sciences and Technologies (Celstec), Open University of the Netherlands, The Netherlands

Objectives
The objectives of this workpackage were to:
1. Identify and validate factors determining the success of integrating the optimal patient care micro-system continuum; and,
2. Develop training tools to assist a successful implementation of the communication model.

Description
The following activities were conducted in WP4:
• Development of a standard training process including critical content checklist;
• Development of tools to be embedded in daily practice that encourage further mastering of competencies after initial training; and,
• Writing of an implementation plan, including the assembly of a group of experts from (participating) European regions to give their opinion in various stages of this workpackage to ensure successful, cross-cultural implementation.

Deliverables
D1 Report on training needs and guideline per region and category (month 12)
D9 Evaluation report regarding training and use of tools (month 36)

Summary
D1: Report on training needs and guidelines per region and category
Was produced in the first reporting period.

D9: Training tools for assisting successful implementation
The general idea of Deliverable 9 was to design and evaluate a training toolbox that supports training specialists when they are confronted with the issue of designing and delivering training in handover for medical staff members. The toolbox acknowledges that approach; content and training participants will vary significantly and therefore a one-size fits all training strategy will not work.

It is advocated that a toolbox containing various kinds of information (training content, training strategies, work environment factors, background information) and that encourages active evaluation and contributions of its users will better address the needs of the intended audience of training specialists.

This differs in scope somewhat from the initial idea as proposed in the Grant: designing a single training that addresses all training needs of various target groups. The solution of a toolbox that offers flexibility for customized training solutions meets the various needs of training specialists in the different European countries and allows them to tailor their own training to local context.
The following activities were performed in the design of the toolbox:

*Interviews:* Though a number of 18 interviews with training specialists were initially regarded as sufficient for D1, it was decided that more interviews would provide a more comprehensive picture of what training specialists actually want and need.

From Month 13 until Month 15 an additional set of 17 interviews were conducted, resulting in a total number of 35 interviews. Interviews were mainly carried out by the Workpackage partners. From Month 13 until Month 17 these interview findings have been summarized with the use of the Writing Persona technique and the support of the Workpackage partners. The writing persona technique is utilized for internal (within project) and external presentations and publications.

*Questionnaire:* In order to gain more insights into training preferences, a survey among the intended training participants (doctors and nurses working in primary or secondary care) was conducted. In total 94 participants from Spain, Sweden, Poland and The Netherlands, whom already agreed to participate in the focus group interviews (see Workpackage 2), were invited to fill out a short questionnaire during the focus group meetings. The support of Workpackage partners and the Swedish project partner has been essential for achieving these results.

Together with the literature findings (as presented in D1) and the interviews with 35 training experts, the questionnaire data was used for designing an examplar handover training. In addition, the questionnaire data was used for publication purposes (paper and scientific article now ready to be submitted for peer review publication).

*Analysis of requirements and technical issues:* To ensure the deliverance of a high quality toolbox, existing electronic environments were analysed in order to collect an overview of the functional possibilities and the technical issues that needed to be addressed. This analysis resulted in the selection of an appropriate platform that was used for building the toolbox.

These activities contributed to the development of a toolbox. A first paper-based version was delivered in Month 19. A first prototype was ready in Month 25 and evaluated with external experts during the project meeting in Brussels. The second prototype was evaluated with users of three different countries. In addition, this version was presented and discussed with experts during the project meeting in Amsterdam in Month 31.

The main advantage of the final version of the Handover toolbox lies in the potential to become an appealing and leading online network for those interested in improving handover practices. Members can continue to actively contribute, resulting in a viable and ever-evolving network that stays up-to-date.

*Significant results*

Besides training experts other people confronted with handover issues, such as students, nurses and doctors, are also considered valuable for the Handover toolbox.

The toolbox consists of a static information part, offering visitors insights into preferred tools for improving handover practices. In addition, the dynamic part of the toolbox offers information about relevant handover themes and engages visitors to participate in an active way and generate additional information.

The information provided in the toolbox is mostly in written form, but also allows for embedding
videos, such as video fragments of the handover project team members. These fragments can also consist of personal accounts on handover problems and/or solutions, training videos, etc. The use of the toolbox and membership is free! To date (21-03-2011) 310 members have registered.

**Reasons for deviation from Grant**

Since the initial idea of an expert group appeared to closely resemble the expert group that was established by Workpackage 1 (for the expert meetings in Brussels and Amsterdam respectively) it was decided not to assemble a new expert group, but to utilize the existing one. During the Brussels and Amsterdam meetings the experts were invited to discuss and comment on the versions of the toolbox, resulting in helpful suggestions for its further design.

During the first year of the project interviews with training specialists were conducted. The initial plan of designing a single training that addresses all training needs of various target groups was dismissed as being too rigid. Consequently, we started to look for another, more appropriate solution. To further support our decision, we continued to interview more training specialists at the start of the second year of the project. These interview findings together with the insights raised during project meetings were utilized to replace our initial proposal for a one-size-fits-all training by the novel toolbox solution. Instead a flexible toolbox was created.

The toolbox differs from the initial training solution since a toolbox offers trainers much more flexibility, resulting into a better alignment with the local needs and trainee preferences. This is supported by using the materials stored in the toolbox as the principal components for setting up particular training. For that purpose a collection of different kinds of materials, including materials useful for ensuring transfer of training and workplace support, was made available through the toolbox. Moreover, the toolbox offered suggestions on how to combine these materials into training for different groups. This very closely resembles the initial idea of proposing training as described in the project plan.

Although the OUNL was the lead, all workpackages were involved in composing and storing the materials in the toolbox. This assured that the main findings and recommendations derived from other workpackages (stored as Handover tools in the toolbox) and were included in the collection of materials in the toolbox. The design of the toolbox was an iterative process and the different design stages were punctuated by evaluations that allowed us to take well-informed decisions about its further development. End-users, e.g. trainers, were interviewed to ensure that the formative and summative evaluations provided insights into the perceived effectiveness of the toolbox.

Indeed, the HANDOVER Toolbox was more work than simply designing a one-size-fits-all training. The additional costs of developing the toolbox were covered by the OUNL and the OUNL considered this as an important investment in future-proof and exiting ways of learning.

**Reasons for failing to achieve critical objectives**

WP 4 aims were met completely. The work activities of Workpackage 4 are in line with the project proposal. Month 36 and onwards focuses on the finishing touches and continuation of the final version of the Handover toolbox to optimize easy access to the static information that presents the preferred tools of the trade.

The Toolbox also provides sufficient opportunities for active participation of members in the different groups that are dedicated to various handover themes.
Finally, D9 was delivered, after approval for extension, 15 days later than planned. This was needed as we needed some time to incorporate recommendations from the final meeting in Florence (which was held one week before the deadline).
1.5 Workpackage 5: Assessing the Safety Climate/Culture

Workpackage leader: Radboud University Medical Centre (RUNMC), The Netherlands

Objectives
The objective of this workpackage was to assess the patient safety culture at the interface between hospital and primary care.

Description
The development of a best practice for handovers on the basis of a systematic literature review, baseline experiments by observing, analysing handover processes and individual and focus group interviews, will not be enough. Research has shown (Bokhoven, 2003; Grol & Wensing, 2005; Baker, 2010) that specific well-planned strategies are required to implement best practices in daily practice. Most theories on implementation of innovations in health care emphasise that an analysis of the barriers to change practice is a prerequisite to develop an effective implementation strategy: effective implementation cannot take place without adequate knowledge, skills and attitudes of the individual care provider and the setting and target group in which the implementation is to take place (Bartholomew, 2011).

Activities
Many different factors (both stimulating as well as hampering) will determine whether implementation of an innovation will succeed. Consequently, the major questions that were investigated in this workpackage were:

1. If there are best practices or evidence based recommendations regarding optimal handover, why do health care providers not use them?
2. Which mechanisms and processes in the implementation phase are responsible for the result and how do they vary within the target groups?

Deliverables
D6 Report on specific problems in care provision and on the factors that influence change (Month 26);

D10 Report on mechanisms and processes responsible for the implementation results and their variation within target groups (Month 36).

Summary
The aims of this Workpackage were met successfully and included: (a) to identify the impact of organizational culture on handover practice and the use of best practices or evidence based recommendations, and, (b) to identify best practices or evidence based recommendations regarding optimal handover, plus mechanisms and processes that are responsible for the effective implementation of these interventions.

D6: Data of the prospective, qualitative study in The Netherlands, Spain, Poland, Italy and Sweden was used. Although the prevailing handover practices differ across Europe, it was found that many of the identified cultural barriers and facilitators appear to be similar in the different studied countries and settings. A fragmented delivery care model and culture at the interface between the hospital and primary care, conflicting professional values and, in some of the countries, the organizational identity of the hospital played a key role in hindering
effective and safe handover practices. In some of countries studied, the presence of a learning culture and patient-centered culture appeared to facilitate effective handovers.

However, as these conditions seem to variable in most countries, they turned out to be a barrier as well. Finally, the extent to which patients (as well as their family care givers) are aware of their own important role and the extent to which they are empowered affect the quality and safety of handovers, both positively and negatively. The results indicate that improving the quality and safety of handover practice in the EU requires more awareness and care for the aspects underlying continuity of care. The findings are sufficiently evident to allow the tailoring of future interventions to address and overcome cultural barriers in handovers and to improve the continuity of patient care.

**D10:** This study provided a useful framework for the development and selection of handover interventions tailored to the local setting. Furthermore, this deliverable gives suggestions for implementation and evaluation of the developed intervention program. The major finding of this deliverable is that current interventions aimed at improving patient handovers at the hospital-primary care interface do not target all the identified barriers and facilitators.

Effective patient handovers at the hospital-primary care interface are influenced by a large variety of barriers and facilitators. However, effective handover interventions are mostly aimed at improving organizational and technical aspects of the handover process. There is a lack of evidence-based interventions that focus on handover training and aspects that relate to organizational culture. This despite research that shows that handover training and attitudes, norms and beliefs, i.e. aspects of organizational culture, are an important context for improving patient handover and a key factor for quality improvement efforts.

**Significant results**
Work package 5 comprises Deliverable 6 and Deliverable 10.

**Deliverable D6**
See above.

**Deliverable D10**
With the use of a stepwise approach (Intervention Mapping or IM) a systematic framework was create in which a tailored, effective intervention program and implementation strategies can be developed to improve patient handovers from the hospital to the community. The data and findings from the qualitative study (reported in deliverables 3, 5 and 6) were used to identify determinants and formulate performance objectives to improve quality and safety of patient handovers.

A systematic review to identify effective handover interventions and the mechanisms or processes that may relate to the findings regarding impact on patient safety and outcomes, along with an additional literature search and brainstorm session between social, organizational, medical and nursing experts, were conducted to identify (evidence-based) methods, strategies and practical tools that matched the identified determinants and formulated performances. Subsequently, the suggestions were provided for effective implementation of local, tailored intervention programs and evaluation research. These findings have now been written up and submitted for peer review publication.
Reasons for deviation from Grant
Workpackage 5 deviates in minor points from the original Grant.

The original questions of this work package were: 1) If there are best practices or evidence based recommendations regarding optimal handover, why do health care providers not use these? 2) Which mechanisms and processes in the implementation phase are responsible for good / poor results and how do they vary within the target groups? We adapted the questions to encompass the focus of each deliverable:

Deliverable 6: How do cultural factors facilitate or hinder handover practice and the use of best practices or evidence-based recommendations? The original focus was to look at why best practices regarding optimal handover are not adopted in practice, by analysing three factors: lack of knowledge, skills and attitudes. However, we extended the study, because we considered it relevant to encompass the attitudinal factors that hinder or facilitate everyday handover practice as well.

A better insight into the role of attitudes on handover can contribute to a better implementation of best practices and to a better understanding of what needs to be improved. Furthermore, because this workpackage is about assessing the safety climate/ culture, we used the term ‘culture’ or ‘organizational culture’ as our conceptual framework.

Organizational culture reflects: a shared set of attitudes, values, believes and norms of stakeholders in the handover process (e.g. interpersonal relationships, habits and structures). Hence, we analyzed in-depth the organizational cultural factors that seem to hinder or facilitate everyday handover practice and the implementation of optimal handover practice.

Deliverable 10: What best practices or evidence-based recommendations regarding optimal handover exist and what mechanisms or processes are responsible for the (effective) implementation of these interventions? The original focus was to look at best practices or evidence based recommendation regarding the patient handover, both at referral and hospital discharge. We concentrated the in-depth analysis on hospital discharge.

Use of questionnaire
We decided to skip the use of a questionnaire as described in the Grant. The intention was to use the outcomes of the questionnaire to refine the intervention and implementation strategy. However, the considerable number of extra interviews provided us with sufficient insights into the hindering factors to sharpen the implementation strategy of the intervention. The survey was deemed therefore unnecessary.

Reasons for failing to achieve critical objectives
All critical objectives for Workpackage 5 were met.

References


1.6 Workpackage 6: Assessment of effectiveness of the intervention

_Workpackage leader: University Of Birmingham (BHAM), United Kingdom_

**Objectives**
The aim of this workpackage is to assess the impact of the model and training modules in different settings.

**Description**
This workpackage comprises the following activities:

- Assessment of effectiveness of the tools: clinical and educational impact of handover on identified intervention strategies, as laid down in the communication model and subsequent tools, on patient welfare; and,

- Cost effectiveness study: assessing the financial impact of handover on identified intervention strategies on patient welfare.

**Deliverables**
D2 Report on the likely cost of the various prototype interventions, based on a model of the likely costs (Month 13);

D7 Report quantifying the expected benefits of the interventions that will be implemented (Month 25);

D11 Report quantifying resources actually consumed in each country by type of intervention (Month 36).

**Summary**
Workpackage 6 was concerned with “assessment of the effectiveness of the intervention”. Since the intervention did not exist at first, we approached this workpackage as follows:

1. Produced a framework for evaluation of the effectiveness of interventions with diffuse effects
2. Created a report quantifying the expected benefits of the intervention.

The first of our tasks was completed on 30-10-2009--A paper has been produced and published by the BMJ with the following title: “Evaluating Policy and Service Interventions” (Lilford et al., 2010).

In this paper, we proposed a new classification of policy and service interventions. This classification is based on a sub-division of the process level in Donabedian’s model “structure - process - outcome chain”. This classification has profound implications for design (especially choice of end point for sample size calculations) and interpretation of evaluative studies. The results indicate that many policy and service interventions are cost effective at a magnitude of effect that cannot be detected at the level of the patient. This paper has been published in the British Medical Journal in August 2010 and is important finding of the HANDOVER study.

The second task (quantifying the expected benefits of the intervention) corresponds to deliverables D7 and D11 (see deliverables above). It comprises two reports: “Bayesian elicitation for the effectiveness of a complex intervention to improve clinical handover in Europe”, and “Report quantifying the resources actually consumed in each country by type of intervention”.

In essence, the opinions on the effectiveness of the proposed intervention to improve the quality of handover practices were elicited from domain experts in terms of the likely reduction of adverse events attributable to poor handover. Such effectiveness was then used to estimate the expected benefits associated to the intervention, after which costs were evaluated for a number of types of training at different intensities that may potentially be based on the handover toolbox.

**Significant results**

**D7:** The aim of this report was to assess the expected benefits of the proposed Handover interventions and to model the size of a potential trial to measure the effectiveness of this intervention. The Handover project aims to develop a suite of interventions to improve the handover of patients between the hospital and the community. These interventions will be customisable and include several options with a focus on creating a virtual training environment called the Handover Training Toolbox.

A literature review identified readmission rates and adverse event rates among the plausible targets for such an intervention. A team of experts was invited to express their beliefs on the expected effects of the intervention in terms of an expected reduction in the attributable risk in both end points. Such beliefs were quantified using Bayesian prior distributions.

An economic model was created to quantify the cost-effectiveness of the proposed intervention contingent on the prior beliefs. The size of a potential trial to measure the effectiveness of the intervention was also modelled. All models included sensitivity analyses. The pooled expert opinion suggested an improvement of 25% in the attributable risk of readmission rates and adverse event rates. The modelling exercise showed that such an effect would be cost-effective in a society that was willing to pay up to 20,000€ to avoid one death and obtain one Quality Adjusted Life Year (QALY).

A future trial to detect a reduced readmission rate would need to be very large to detect cost-effective and plausible effects given most assumptions. The implementation of the handover toolbox is likely to be cost-effective. The sample size for a trial to evaluate it is very large under most assumptions. The option value analysis and value of information analysis was delivered on 30th Sept 2011.

**D11:** The aim of this report was estimate the costs of the implementation of the toolbox in real practice for European countries and compare these with the potential benefits that it might bring. A cost effectiveness analysis can be performed if a measure of the benefit and a measure of net costs is available. The benefit of the proposed intervention was estimated, on the basis of a Bayesian exercise, in deliverable D7. This report focused on the net costs of the implementation of the toolbox. The implementation of the toolbox needs the definition of a number of training modules that can be based on the toolbox, their resources and relative costs in different EU countries.

Four training modules at different intensities of resource use were defined:

s1. Community of Learners;

s2. Facilitated Community of Learners;

s3. Conventional Training in a Classroom;

s4. Technology enhanced learning in a virtual environment.
For every country, the highest estimate of the cost is below 40,000€ per 10,000 admissions, while the expected benefit, including the expected savings, is around 6mln€ for every 10,000 admissions using adverse events as an end point.

The expected benefit of the intervention seems favourable relatively to its likely cost. However, it should be acknowledged that while costs can be anticipated with reasonable certainty, the benefits are little more than an informed guess. The size of effect necessary to justify this relatively low cost intervention is small, and it is unlikely that a rigorously designed study could be large enough to detect such an effect at the patient level. Nevertheless, we recommend a phased introduction of the technology with decision gates where formal roll-out would depend on favourable effects in surrogate endpoints upstream to the patient.

**Reasons for deviation from Grant**

The intervention (The Handover Toolbox) was theoretically defined but not fully developed (i.e. not available for pilot implementation) before the end of the project, therefore the costing exercise could only be conducted based on reasonable and robust assumptions. The costing exercise took a broad perspective and aimed to give an indication of the extent and causes of variation in the cost of different training strategies.

In summary, a pilot implementation of the intervention in order to measure the costs of implementation was not possible, for there was not enough time to do it in the planned manner. However, an accurate description of a number of training methods has been performed in collaboration with the EU partner Open University. The resources needed to deploy the intervention have been described and the following EU partners were invited to estimate the cost of these resources in their countries: The Netherlands, Sweden, Italy, Poland and finally UK.

The evaluation was performed for 10,000 discharges and for a number of reference hospitals. Cost differences between countries were mainly due to different numbers of clinical staff needed to train and different costs of resources. This is a significant addition to what was proposed in the project.

**Reasons for failing to achieve critical objectives**

All critical objectives for Workpackage 6 were met apart from not being able to implement and measure the effect of a pilot intervention in the planned manner (see above). We published this work in the British Medical Journal, a now widely cited article and which will have great influence. We believe this paper, already cited 12 times, will have major impact on designing studies for assessing handover interventions as well as other public health trials.

**References**

1.7 Workpackage 7: Best practices, priorities and dissemination of results

Workpackage leader: National Center for Quality Assessment In Healthcare (CMJ/NCQA), Krakow, Poland

Objectives
Making an inventory of best practices throughout Europe, choosing priorities taking into account cultural differences between European regions and dissemination of results to stakeholders.

The aims of this workpackage were to:
1. Reach consensus among experts on tools to improve handovers in clinical care (and translate these into recommendations); and,
2. Foster adoption of safe and effective handover practices - based on findings of the participating partners and network members - by stakeholders and the general public.

The main deliverables of WP 7 focused on dissemination of the results of the project. Deliverable 12 is the final deliverable of the Handover project; it presented how the project research was translated into practice by means of publications, talks, scientific proceedings, recommendations and products. The recommendations are aimed at the European Union, EU Member States, hospitals and hospital organizations, primary care organizations, professional organizations and medical societies, patients and patient organizations, educators and researchers. The products include the Handover website and Handover Toolbox.

Description
The HANDOVER website www.handover.eu has been developed, administered and hosted by the beneficiary from Poland, National Center for Quality Assessment in Healthcare (NCQA) in Krakow, with the support and involvement of the whole HANDOVER project team. The site will continue to be supported for one year after the end of the funding, until end of 2012. We are seeking other funding sources to continue the development and impact of this website.

The site presents the functionalities that were requested by and expected of the group and provides a compendium of information on handover, both in Europe and globally. Information is available in English but also in the native languages of project partners: The Netherlands, Italy, Poland, Sweden, Spain, United Kingdom (see Chapter 3, Deliverable 12).

The Handover Toolbox www.handover.ou.nl is an interactive platform and the compendium of knowledge about education and training in handovers as well as the library of practices, tools and techniques related to patient handovers. The interactivity of the handover network facilitates the sharing of experiences and practices in handovers. The added value of the toolbox is to emphasize the importance of handovers in the process of care and the significance of education in the field.

Deliverable 12 also includes guidelines regarding content, design and practicality of tools and practices based on trials with (training) experts from 5 countries: Poland, Italy, The Netherlands, Spain, and Sweden. See Chapter 2 and in Deliverable 9 for more information.

Deliverables
D12 HANDOVER final report (Month 36) was delivered in timely manner on 30 September 2011.
Summary / Significant Results

Workpackage 7 contains recommendations based on results of the HANDOVER research (e.g., workpackages 2, 3, 4, 5 and 6) that were be provided to the European Commission and other groups and levels of the healthcare system, i.e. the EU Member States, hospitals and hospital organizations, primary care organizations, professional organizations and medical societies, patients and patient organizations, educators and researchers. Thus far, 8 manuscripts have been submitted to peer review publication, 3 being accepted, and 5 under evaluation.

We have come to agreement with the BMJ Quality and Safety journal to publish a dedicated supplement to the HANDOVER project later in 2012. The project has also supported 2 PhD Research theses, both in their 3rd and final year. We expect they will submit and defend their PhDs by early 2013.

Workpackage 7 further comprises the following elements:

- Trial of Handover Toolbox in partnering countries/institutes: the developed tools and training packages were tested in five of the partners’ institutes (i.e. Sweden, Poland, Spain, Italy and The Netherlands). The handover toolbox was also evaluated by the experts during two expert meetings. Deliverables were shared with the EUNetPas project and relate to the research on implementing further work on patient transitions within the EU Joint Action on Patient Safety and Quality of Care;
- Development of interactive, comprehensive, user friendly website that supports and brings together the knowledge around handovers with specific focus on the reservoir of good, existing handover practices. Also co-development of the Handover Toolbox – a library comprising educational methods, techniques and practices;
- Organizing the two Expert Meetings to provide an evaluation of the Handover research, trials and the results of WP2, WP3, WP4, WP5 and WP6 by experts of the field. The participants of these meetings included the project partners, representatives of the European Commission, national governments and relevant stakeholders from both primary and hospital care levels (e.g. WONCA Europe, the European Society for General Practitioners) as well as experts from the relevant US authorities and representatives from pan-European and national patient organizations (e.g. European Patient Forum; ESQH Padova Office on Patient Centeredness);
- Report from the expert meetings. Deliverable 12 is based on the findings and recommendations from the diversified group of experts participating at the 2 expert meetings. The final project recommendations were provided to the European Community, addressing the stakeholders of different groups and levels; and,
- Organizing the final conference on handovers at the primary care / hospital interface in Florence in cooperation with the project team from Italy and with input from all the project partners. The conference presented the overall results of HANDOVER research to an international audience from the EU, USA and Australia, focusing on the challenges of practical implementation of HANDOVER study recommendations.

Reasons for deviation from Grant

Workpackage 7 deviated in minor points from the original Grant. This includes the planned partnering with the European Union Network on Patient Safety (EUNetPas) regarding the assessment of tools, as this would entail obtaining information from 27 different member states. However, due to the fact that the EUNeTPaS project was already finished and its network was dismantled, the decision was made to work closely instead with experts of the EU Working Group on Patient Safety and Quality of Care, whose members constituted the core group of EUNETPaS project. There is a promising perspective to relate the research of HANDOVER to the work
planned within the plan of action of the 2012 Joint Action.

Another minor but positive deviation is the organizing of not one but two experts meetings, one in Brussels, and a second one later in Amsterdam. This was the result of the diversity of research conducted within the Handover project and the necessity of the HANDOVER network to relate its findings to the reliable review and comments of experts. This supported our effort to reach consensus on different approaches, tools and solutions.

Finally, D12 was (after approval) delivered 15 days later than planned, because we needed some time to incorporate recommendations from the final meeting in Florence, held one week before the deadline. We learned an important lesson about scheduling our final meeting not later than 90 days before the end of the project.

**Reasons for failing to achieve critical objectives**

All critical objectives of Workpackage 7 were met, with the added caveat that “fostering adoption of safe practises” is an ongoing process that needs to be sustained over the years. The work has led to several funded projects in Norway, Greece and Netherlands, to help sustain the lessons adopted from HANDOVER.
1.8 Other activities

1.8.1 Assessing barriers and facilitators for effective handover in minority groups
Avedis Donabedian University Institute, Autonomous University of Barcelona (FAD)

Objectives

Identifying the main barriers and facilitators to enhance effective communication between primary and hospital care, regarding chronic patients in Spanish minority groups.

Description

Many healthcare studies have explored the lack of access to health care facilities for minority groups, such as people with mental health problems, disabled people or people belonging to distinct ethnic groups. Evidence suggests that people belonging to minority groups experience disparities in quality of health care that cannot entirely be explained by differences in access, clinical appropriateness or patient preferences. There is also evidence that health care providers’ behaviour (individual and institutional) and practice patterns contribute to such disparities.

In Spain, the clinical focus was on the communication between hospital and primary care in patients qualified as minority groups. We focused on minority groups as patients with well documented limited health literacy skills and cultural competency and with idiomatic barriers. These factors are associated with the continuity of care and handovers.

A sample of patients belonging to minority groups and their care providers were interviewed individually as well as in focus groups. The data collection and analyses were organised around different themes (i.e., attitudes, knowledge, process, content and organization).

Significant results

Current handover practices from hospital to primary care are often haphazard and risky. Professionals working at both secondary and primary care levels are aware of the shortcomings in the handover process. Closing the gaps in the system require the explicit shifting of more responsibility towards patients and their families. Patients from socially disadvantaged groups, those with low health literacy, low cultural competency and confronted with linguistic barriers are at a particular risk. Further research should address potential implications of this imbalance on adverse events and effective interventions to improve patient handovers.

The activities and information collected was also used by several workpackages of this project:

• Adding information regarding main barriers and facilitators between primary and hospital care within this specific group of people. (WP2)
• Gaining knowledge about the cultural dimensions (WP4)

This work has been written up and submitted for publication in late 2011. We are awaiting final response from the journal.

Groene O, et al. It’s like two worlds apart...” - an analysis of handover practices between secondary and primary care and their implications from the patients’ perspective, J Health Expectations, under review.
1.8.2 Barriers and facilitators in handover processes underlying (mis)communication between professionals

Azienda Sanitaria Firenze (ASL 10 FIRENZE)

Objectives
The Italian partner of the Handover Project reviewed many barriers and facilitators in handover processes with particular focus on communication between healthcare professionals. Adverse events linked to mishaps and pitfalls in patient transitions were also examined. The Azienda Sanitaria Firenze represents the major healthcare service in Florence and other healthcare institutions in Tuscany. The impact of this research among professionals involved, increased awareness and urgency to improve settings in communication to prevent errors occurring during handovers. A correct handover assures reliability to patients, caregivers, family, nurses and physicians, sustains continuity of care and reduces adverse events and near misses.

Description
Interviews with healthcare professionals linked to patient transitions among hospital and primary care were conducted by a communications and human factor expert researcher. The participants included nurses and doctors within emergency department settings and surgery wards in two local hospitals of Florence: a rural and a city facility. Patients were recruited on a voluntary basis and interviews were registered and coded according to guidelines agreed by the entire team. Family members and primary care physicians were also recruited for analysis. Focus groups were conducted to complete interview analysis and opinion gathering.

The Italian team also participated in building the toolbox necessary for either experimental reasons and education and training. Researchers in the group majored in the field of ergonomics and communications, medicine and cognitive analysis. These professional backgrounds assured a complete assessment of tools in terms of usability, realization and implementation proposals.

Development of process maps and assessment of different tools used in communications and their effects on the entire process (artefact analysis) were also part of the methods used to better understanding the nature, efficacy and impact of patient handovers.

Significant results
Italy’s contribution was in many WP’s but especially focused around WP2: interviews, focus groups, process mapping and artefact analysis. For WP4 tools, the education and training tools of the HANDOVER Toolkit were tested and submitted to human factors and cognitive analyses.

The entire handover process in the Italian setting was carefully examined in terms of adverse event prevention and near miss analysis (WP4). The impact of correct handovers on the culture of risk management tools among healthcare professionals and institutions emerged from the cognitive analysis of handover process in patients’ opinion and primary care physicians. Caregivers contributed to our understanding of many of the mishaps in transitions from a hospital setting; communication errors, insufficient tools to prevent communication errors and the lack of situation awareness of near misses due to incomplete transitions, was the main focus of our collaboration with WP5.

The impact of economic interests in promoting safe patient transitions among hospitals and primary care has been the principal aspect of collaboration with WP6; the financial impact of a
correct handover in the Italian healthcare setting was focused on claims and litigation analysis given our data that shows the relationship between poor handovers and many adverse events.

Our data proved that correct communication and the use of lean tools in patient transitions can reduce malpractice claims.

The insurance companies require in many contracts that all hospitals have a clinical risk assessment and management program regarding patient safety. A particular requirement for primary care and hospital relations is the containment of pharmaceuticals and readmissions. Some of the HANDOVER patient safety checklists were analyzed and proved to be reliable instruments.

Benchmarking with other hospitals was necessary to acquire more information on culture and economical aspects of patient handovers. This process required interviews and assessments of caregivers and primary care physicians. The professionals actively participated in all meetings and focus groups. Professionals were particularly asked their opinion regarding education, training and implementation of correct patient safety tools such as proposed for a correct handover.

Interesting data emerged from the human factor analysis. We found that healthcare professionals relied not only on artefacts but also on smoother and lean processes applied to the handover process (WP7).
Chapter 2 Project management

2.1 Consortium management tasks and achievements

The grant was structured around regular meetings 3 times per year over the 36 months of the project. In total we held nine meetings, and, two expert meetings. The meetings were primarily planned around scientific conferences on quality and safety in Europe to facilitate costs and availability of HANDOVER team members.

The HANDOVER team held regular monthly calls, supplemented by numerous group emails a month. The Scientific Coordinator and the Project Manager were in regular contact with the WP leaders, including detailed visits to each of the sites during the project. All of the above contributed to a growing sense of cooperation and collaboration. We think this is a hugely important in generating good will and a spirit of collaboration. This effort helped WP partners to contribute above and beyond the allocated funds by way of in-kind resources.

The Project has developed close coordination with EUNetPaS and DuQue, QuASER EU FP-7 projects. It has also developed extensive relations with US AHRQ funded teams, and Norwegian and Greek nationally funded patient handover studies. The institutions presented jointly at several international meetings (i.e., Academy Health, 2010; Institute for Health Improvement, 12/2009, International Society of Quality in Healthcare, 2011).

2.2 Challenges & their solutions

A major challenge at the third quarter of 2011 of the project was the departure of Dr. Loes Pijnenborg as the Handover project manager. The Utrecht project team was able to find an experienced project coordinator, Dr. Jerry Andriessen, to help finish the project in the last months, including the final Florence conference.

2.3 Changes in the consortium

None in the second period.

2.4 List of project meetings, dates and venues

The meetings attended by all HANDOVER collaborative members of the HANDOVER project, including the General Assembly include:

<table>
<thead>
<tr>
<th>City/Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockholm, Sweden</td>
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<tr>
<td>Nijmegen, The Netherlands</td>
<td>January 7th and 8th, 2009</td>
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<td>Berlin, Germany</td>
<td>March 20th and 21st, 2009</td>
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<tr>
<td>Barcelona, Spain</td>
<td>September 16th and 17th, 2009</td>
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<td>Birmingham, United Kingdom</td>
<td>February 10th and 11th, 2010</td>
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<td>Nice, France</td>
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The dates of conference calls with all HANDOVER collaborative members of the HANDOVER project, including the General Assembly:

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<th>Date 2010-2011</th>
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</table>

2.5 Project planning and status

The project delivered on schedule and budget, thanks to good management and collaboration within the HANDOVER team. Solid structuring and planning of the project facilitated this collaboration in spite of some manpower changes.

An Appendix to this report shows the work completed by each members and team in terms of individual time spent on each WP during the second period.

Project structure and management

The overall scientific management was led by Professor Paul Barach. The administrative, financial and legal management by Loes Pijnenborg, both affiliated with the UMC Utrecht.

The project planning was based on the description of Workpackages, Deliverables and Milestones in Annex I. The Project Manager (Loes Pijnenborg) and the Scientific Coordinator (Paul Barach) organized meetings every four months and conference calls every month, attended by the HANDOVER team, including the members of the General Assembly. The minutes of the meetings and conference calls were taken and confirmed in the next meeting or call. The minutes included a active ‘to-do list’.

Every month the activities and progress of the team members were discussed. In general, if there were any problems, the Project Manager or the Scientific Coordinator contacted the beneficiary
and helped the beneficiary to overcome the problems. In this way possible big problems were addressed before they escalated. We asked the HANDOVER team and especially the General Assembly during every meeting if they were content with the management and if there were items that could be improved.

The HANDOVER team was very content with the way the project was managed. Suggestions for improvement included more site visits, active to do lists after each call, and increasing the readability of Sharepoint website, in which project documents and presentations are shared.

The financial controller at the UMC Utrecht (Tom Peereboom) has been in contact with the financial controllers of the other beneficiaries on a regular basis. He organized three call conferences on the financial management of the HANDOVER project. He was recruited to another position in the 3rd quarter of 2011 creating some challenges in closing out the financial data of the project.

**Inter-workpackage alignment**

Because of the frequent calls and meetings, the work within the workpackages was well tuned, collaborative. Sometimes, however, a workpackage had to wait for the results from another workpackage. This was the case for WP6.

**Contact with EU Commission**

The contact with the EU Commission, especially with Jan Paehler and Maria Psimenopoulou was always very pleasant, professional, careful and accurate. Jan Paehler visited our HANDOVER meeting in Nijmegen in January 2009 and we enjoyed him taking an active role in the deliberations. Loes Pijnenborg and Cor Kalkman visited Brussels in October 2009 to meet with Jan and Maria. In October 2010, Jan Paehler and Kevin McCarthy visited our first HANDOVER Expert Meeting in Brussels.

2.6 **Impact of possible deviations from the planned milestones and deliverables**

Not applicable. All Milestones were achieved on time.

2.7 **Development of the Project Website**

The beneficiary of Poland (NCQA) developed an aesthetic, user friendly and informative website on [www.handover.eu](http://www.handover.eu).

The website consists of several tabs:

- **Project info**: Explains content of the project in English and all native languages of the partner countries. This tab includes deadlines of deliverables and finished deliverables for downloading.
- **Partners**: The organisations introduce themselves here, including the members of each team.
- **Workpackages**: This section provides the description of all workpackages, their leader profiles, objectives, description of work, role of participants and deliverables.
- **Library**: is where the presentations, project reports to the EU, articles, publications by the project team and its network, patient and clinician narratives and multimedia are placed.
- **Events**: This tab presents events, narratives and photos of HANDOVER partner meetings in several European countries and also serves as a place for announcing project news.
• PhD corner, in which PhD students on the HANDOVER grant introduce themselves and their PhD project.
• Contact info tab is where people can find the names and contact details of the Project Leader and Project Manager in order to obtain more information on the HANDOVER project.

Comment about the Milestones table: The Milestones table is the same as was provided for the first period, no milestones were added nor removed. All Milestones set for the current period were achieved.
### Appendix: Time spent on WP’s, for each person in period 2 (in Person Months)

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