



Anne Marie Weggelaar-Jansen

# **Learning to Improve Improved Learning**

**Leren verbeteren, verbeterd leren**



# Learning to Improve Improved Learning

Leren verbeteren, verbeterd leren

## Proefschrift

ter verkrijging van de graad van doctor aan de  
Erasmus Universiteit Rotterdam  
op gezag van rector magnificus  
Prof.dr. H.A.P. Pols  
en volgens besluit van het College voor Promoties.  
De openbare verdediging zal plaats vinden op

donderdag 30 april 2015 om 15.30 uur

door

Johanna Wilhelmina Margaretha Weggelaar-Jansen  
geboren te Amersfoort.



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Prof.dr.ir. J.M.H. Vissers



I was quick, thinking in clear images,  
now I am slow, thinking in broken images.  
I became dull, trusting my clear images,  
now I become sharp, mistrusting my broken images.  
Trusting my images, I assumed their relevance,  
now I mistrust my images, I question their relevance.  
Assuming their relevance, I assumed the fact,  
now I question their relevance, I question the fact.  
When the fact failed me, I question my senses,  
now when the fact fails me, I approve my senses.  
I continue quick and dull in my clear images,  
now I continued slow and sharp in my broken images.  
In a new confusion of my understanding,  
and in a new understanding of my confusion.

*(bewerking van Robert Graves poem Broken Images, 1895-1985).*

ISBN: 978-94-6182-553-7

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More information: [annemarie@weggelaar.com](mailto:annemarie@weggelaar.com) or 06-29010283.

Cover design: Erik Visser.

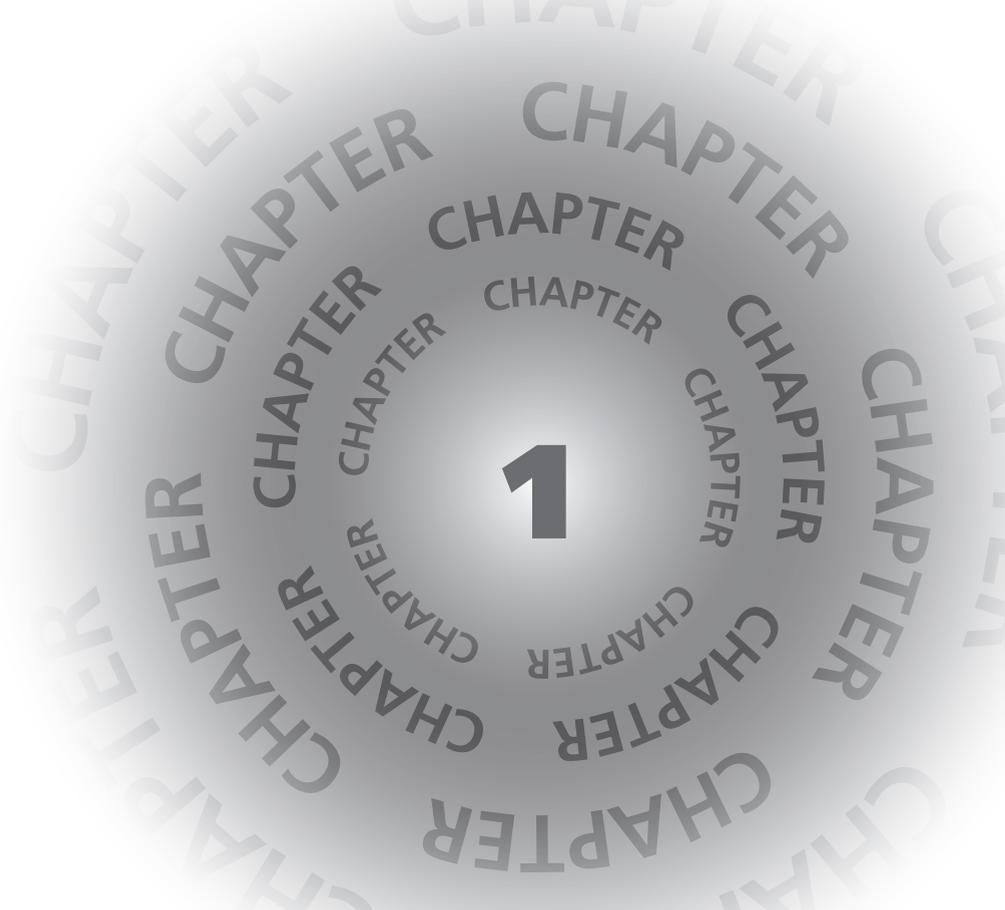
Layout: Paula Berkemeyer, Amersfoort, [www.PBVerbeelding.nl](http://www.PBVerbeelding.nl).

Printed by: Offpage.nl, Amsterdam.

# Contents

Chapter 1	Introduction on Quality Improvement	9
Chapter 2	Learning and Quality Improvement Methodology	45
Chapter 3	Quality improvement guidance processes in Europe	73
Chapter 4	Learning to Improve: The Learning Organization in a Quality Improvement Collaborative in Dutch Hospitals	101
Chapter 5	Do quality improvement collaboratives' educational components match the dominant learning styles of the participants?	121
Chapter 6	The transfer of knowledge and skills in a Quality Improvement Collaborative focussed on improving patient logistics	147
Chapter 7	Sustainable care pathways will be revealed by walking the path together: Action research on care pathway development	175
Chapter 8	Computer screen saver hand hygiene information curbs a negative trend in hand hygiene behavior	201
Chapter 9	Reducing Healthcare associated infections: lessons learnt across European hospitals	213
Chapter 10	Conclusion: Develop people, rather than fix the problem	231
	Summary	269
	Samenvatting (Synopsis in Dutch)	283
	Acknowledgement	297
	Bio	301





# 1

## **Introduction on Quality Improvement**



## **1.1 Introduction**

I enter Bob's room and take a seat at a small table full of paperwork. This doctor has agreed to meet me for half an hour, but only after my tenacious attempts to get an appointment. Three e-mails went unanswered and several telephone calls to his management assistant didn't get me very far. Finally, he agreed to meet me when I called him on his beeper, pretending to be a colleague. I assume he only gave in to me in the end to put a stop to my stalking behaviour.

I start by explaining why I want to talk to him and why I feel his opinion is relevant for my research. He looks irritated, and I'm thinking, let's cut to the chase and not waste time. So I ask, "Why don't you want to be on a team aiming to improve the care pathway and patient journey of a patient group you are responsible for?" He answers: "I've already been on several teams with the same goals, but in my opinion we didn't achieve anything useful. Of course, there were minor changes, but not the substantial ones I feel are needed to make real improvement. I wrote all my ideas down repeatedly. If you like I can email it all to you."

I notice the frustration on his face. "Would you mind explaining what happened?"

He replies, "For the first improvement project in 2007 I made a flow chart of the current and desired situations. But the nurse practitioner we requested, who we needed to achieve the goal, wasn't approved. We sent a request for funding to the Board of Directors and heard nothing for quite a few months. By the time it was clear that we weren't going to get the additional funding to appoint a nurse practitioner, the improvement project had stopped. A year later, a new organization-wide programme to improve patient care and reduce costs started up and we were invited to participate. This programme began with an extensive analysis of the current situation, based on data gathering. I had to deliver all kinds of data about my work in timesheets, check boxes, and so on. The 30-page analysis clearly showed that we needed somebody to coordinate the care of our patient group. After the analysis was done, the programme team members went to other departments to carry out further analysis, and we were left on our own, given the challenge to improve. But we already knew that we were not going to get a nurse practitioner to do the coordination work if the programme manager was not going to help us shift the money around. The project team never met again. Three years later a new colleague joined the department and took up the challenge. He joined the national programme to improve our patient-centeredness, logistics, and safety. Again I put in an effort by doing the problem

analysis and brainstorming about solutions to our problems.”

In an increasingly irritated voice he adds, “I went to all these meetings in Utrecht, with young people telling us what we should do. And what happened? Nothing! Absolutely nothing! ... I have better things to do with my time than joining yet another project team. The problem is exactly the same as it was in 2007 and the solution is clear. I wrote it up, and unless you are somebody who can help me get funding for a nurse practitioner, I have nothing to add.”

I am stunned by his idea that writing down your ideas will help to improve your situation and that there is only one possible solution, based on a nurse practitioner doing the coordination. Normative as I can be, I think: How foolish that he never tried to influence people, start negotiation, or find others to join in his cause and try to start a social movement. I pull myself together and as a researcher, ask a question: “Why do you feel that writing down your ideas helps achieve improvement? I don’t know your children, but if I ask my children in writing to tidy their room, almost certainly they’ll do nothing. If I want them to be tidier, I talk to them, make them understand why it is important, explain what the consequences are if they don’t clean their room. So, please would you explain to me what your thoughts are?”

Bob falls silent. After a few minutes, he replies. “I tried to talk about my hopes and desires for this patient group with several managers. I feel it is their responsibility and task in this organization to explain, negotiate and provide the change needed. I’m just a simple doctor, not somebody who’s studied change management or organizational behaviour like you have.”

I still wonder why he feels incompetent to change anything at all and say, “I see, you feel it is the responsibility of managers in this organization and your task is to be precise about what needs to be changed. Am I right?”

“Yes, I think so,” agrees Bob.

Then I say, “Could you perhaps give me an example of how things change like this, because I’m not really sure how it works.”

Bob answers without hesitation: “When a patient needs care I write a prescription for medication, a written request for a diagnostic test or hand over a leaflet with advice on lifestyle changes. The next time I see the patient these things have been done and most of the time the patient is much better or it is clearer what he is suffering from.”

In a split second, I understand that his whole primary work process is organized around writing things down and that other people take up the task to provide the change needed: no wonder he feels that writing it down is the solution!

The above narrative from my own experience makes it clear that healthcare professionals are willing to work on quality improvement, but that it is not so easy to gain results. Healthcare professionals, such as physicians, nurses, dietitians, occupational and physical therapists, etcetera, are almost every day confronted by improvement aims and involved in improvement work. In 2009, the American College of Healthcare Executives did a survey asking hospital CEOs about their major concerns <sup>[1]</sup>. The top two issues were financial challenges (77%) and patient safety and quality (43%). Improving quality and safety of care while reducing costs simultaneous is the challenge facing every politician and healthcare manager. I assume this is the same for Dutch managers. Thus, management and professionals are both interested in quality improvement. Nevertheless, as numerous studies have shown, it is not easy to achieve results, especially to sustain improvements made, for all kinds of reasons <sup>[2]</sup>.

The use of healthcare in Western countries has increased in recent years due to the ageing population, increases in chronic illnesses and co-morbidity <sup>[3]</sup>, availability of new techniques fostering the demand, empowerment of patients and their loved ones, and the demands of society <sup>[4]</sup>. Dutch quality of care is good, compared to other Western countries <sup>[5]</sup>. Since 2005, the Netherlands has been one of the top three countries with the best patient rights and information, best results for care, access, availability, and use of medicine and prevention activities, according to the Health Consumer Powerhouse (HCP) <sup>[6]</sup>. The Netherlands also tops the list of 34 nations in the 2012 Euro Health Consumer Index (the 'industry standard' for modern healthcare). Nevertheless, 14.1% of the Dutch gross domestic product was spent on healthcare in 2013 <sup>[7]</sup>, and the money spent on health and welfare has increased by almost 200% since 2000 <sup>[8]</sup>. Thus, Dutch quality of care is good, but research also shows that we do not have the most cost-effective care <sup>[5]</sup>. The increasing demand for healthcare and rising costs are boosting the need to improve the efficiency of daily operations and provide higher quality while lowering the cost curve. Quality improvement work is seen as the answer to this challenge. However, quality improvement work is time consuming and when no results are available <sup>[2]</sup>, improvement work is a very expensive way of trying to face this challenge. There is a need for research on the most effective ways to perform improvement work and ways to sustain the improvements made.

Much research has already been done on improving hospital care. The literature on effective treatment and care (evidence-based medicine) and best practices regarding the organization of healthcare (logistics, human resource management, general management) has increased extensively in recent decades. In addition, an extended body of knowledge is available on quality improvement

work to implement the evidence on effective and efficient care. Most of the reported improvement research consists of comparisons of pre-test (T0) and post-test (T1, rarely T2) situations, showing the results gained in a particular improvement project in a specific context. The findings of such articles present data on the results gained, preferably measured with validated survey instruments. Most articles describe the improvement approach and/or interventions only very superficially. Reports on improvement work that does not achieve its desired goals, causes quality of care to drop, or is financially or managerially ineffective are rarely found in the literature. Publication bias is likely. Therefore, in this thesis, I focus on the change methodology behind quality improvement work, focusing especially on the educational aspects of the change methodology studied. Research shows that healthcare professionals are the most important drivers of improvement work <sup>[2]</sup>. Educating healthcare professionals to perform quality improvement work is the most important intervention for continuous quality improvement <sup>[2]</sup>. In the Netherlands, it is usual to start a (national) improvement project or quality collaborative programme to meet centrally set improvement goals. Education of healthcare professionals in quality improvement work is done during these improvement projects and programmes. A form of experience-based learning (see § 2.4) should take place. The intricacies of the mutual relationship, between attaining improvement goals in projects and simultaneously educating healthcare professionals to perform improvement work, have seldom been addressed in research to date. The research presented in this thesis provides a stronger evidence base for what helps and hinders hospitals' improvement work by focusing on the education of healthcare professionals in performing improvement work when they are doing improvement work.

In this introductory chapter, I start section 1.2 with a definition of quality of care. Next, I elaborate on the context of quality improvement work in Dutch hospitals. Section 1.3 describes the drivers of quality improvement in the Netherlands. Section 1.4 explains the concept of continuous quality improvement and explains the success and hindrance factors in quality improvement. Section 1.5 discusses the overarching research question of this thesis and section 1.6 explicates the research methodology stemming from this question and explains the structure of the thesis.

## 1.2 Quality improvement in healthcare

This section defines quality (§ 1.2.1) and quality of care (§ 1.2.2).

### 1.2.1 Quality

Quality has a profusion of different definitions, depending on various paradigms and views of the importance of certain aspects<sup>[9]</sup>. Some authors<sup>[10]</sup> define quality as **something superior** to other comparable products or services or systems. Others<sup>[11]</sup> define quality as **fitness for the purpose**. As long as the consumer or important stakeholder finds the inherent features or characteristics of the product, service or system satisfying, one can address this as quality<sup>[12]</sup>. In this perspective, what we define as quality changes over time and is subject to a gap analysis in our mind of what we **perceive and were expecting**. What we expect is based on previous experiences, personal needs, and communication with others<sup>[13]</sup>. Quality is also described from the viewpoint of producers of products, processes, services, or systems in terms of the degree to which the specifications are met without spending unnecessary effort or money<sup>[9]</sup>. From this paradigm, the focus is on conformance to agreed norms, **efficient production**, and avoiding failures and defects.

Avedis Donabedian<sup>[14]</sup> distinguishes three dimensions of quality: **structure, process, and outcome**, which all should contribute to efficiency, effectiveness and patient-centeredness. Structure focuses on the availability and quality of resources, management systems, and policy guidelines. It is assessed by accreditation and sometimes licensing. Process focuses on group processes and individual activities to deliver the product, service, or system. Outcome is the result of the processes and the product, service, or systems as delivered to the customer.

### 1.2.2 Quality of care

The US Agency for Healthcare Research and Quality defines quality of care as “doing the right thing, at the right time, in the right way, for the right person and having the best possible results”<sup>[15]</sup>. Later on, they added to this definition, “by offering care consistent with current professional knowledge”<sup>[15]</sup>. The National Health Service (NHS) in England describes quality of care as “care that is effective, safe and provides as positive an experience as possible”<sup>[16]</sup>. The Dutch Quality

Act (1996) defines quality of care as “the healthcare provider offers responsible care, (which) is defined as care of a good quality level, at the least effective, efficient and patient-oriented care geared to the real needs of the patient” [17].

The various definitions are further explored by adding **several elements of quality of care**. The United States Institute of Medicine uses six major quality elements: safe, effective, patient-centred, timely, efficient and equitable [18]. The Dutch National Council of Health (Nationale Raad van de Volksgezondheid) uses three elements and 15 related aspects of quality: 1) organizational quality, 2) quality of the attitude of professionals and 3) professional quality/having methodical technical skills [19]. Donabedian’s three perspectives of quality [14] are also translated to healthcare. Structure is human and material resources. Process is care pathways and operations management, and Outcome includes mortality rate, healthcare-associated infections, performance and customer-focused results [20].

All descriptions of quality of care use the same words: **effective, efficient and patient-centred**. By this, the ideas from the ‘fitness for the purpose’ and ‘specifications were met without spending’ definitions are used to describe healthcare quality and incorporate both the organization and professional perspectives.

In the past decade, **safety** has become increasingly important, in the Netherlands as well. Do no harm to patients, avoid preventable errors and even preventable death are all seen as important objectives for quality improvement initiatives. From the quality standpoint, attention for safety can be seen as improving the quality of care by focusing on (possible) deficits in the system and detrimental effects for patients. This is aligned with the perspective of producers on quality.

In a recent colloquium, UK healthcare professionals, academics and patient representatives tried to unpack the meaning of quality in healthcare [21]. Two key questions at this conference were: What are the trade-offs in privileging one account of quality over another? Moreover, how do we reconcile different ideological perspectives about quality? The delegates concluded that quality of healthcare depends on holding a balance between sometime contradictory perspectives on what constitutes quality. They mentioned several **tensions, even paradoxes, in the conceptualisation of quality** between different actors in the healthcare system. For instance, the tension between patients’ subjective experiences versus the quantification of quality by measurements of proven (evidence-based) scientific knowledge. They called for more creativity and flexibility for healthcare professionals to embrace these tensions in order to provide uniquely tailored quality of care that meets the complexity of divergent demands,

rather than a one-size-fits-all prescription of quality.

The delegates added **trust** as an important new specification of quality. “Trust (is) identified as fragile, negotiated and emerging from social practices and not – as is often assumed – a thing. Trust is something we ‘do’ in relationship with others, and is as crucial to success of professional teams as it is to professional-patient relationships. (...) The potential value of trusting patients in initiatives such as experience-based co-design, where patient identify things that **really matter** to them is part of an organization’s approach to quality improvement”

[22 p.66].

In the European QUASER study [23] concepts of ‘quality of care’ were studied in England, Portugal, Norway, Sweden and the Netherlands by examining patient safety, clinical effectiveness and patient experience. More insight was gained into the meaning of quality in various healthcare system levels: national bodies (macro level), senior hospital managers (meso level), and professional groups in clinical microsystems (micro level) [24]. The researchers concluded that **quality means different things on different levels**. “The three quality dimensions: clinical effectiveness, patient safety, and patient experience were incorporated in macro level policies in all countries. Senior hospital managers adopted a similar conceptualisation, but also included **efficiency and costs** in their conceptualisation of quality. Quality in the forms of measuring indicators and performance management were dominant among senior hospital managers (with clinical and non-clinical backgrounds). Quality was strongly linked to professional roles, personal ideas, and beliefs at the micro level. **Clinical effectiveness** was dominant among physicians (evidence-based approach), while **patient experience** was dominant among nurses (patient-centred care, enough time to talk with patients). Conceptualisation varied between micro systems depending on the type of services provided [25 p. 478]. Because the researchers did not include efficiency, cost or the patients’ perspective, the study gave a limited analysis of the conceptualisation of quality. Nevertheless, the conclusions they draw from their analysis are relevant for this thesis. The researchers challenged managers to align the different perspectives and conceptualisations of quality. Otherwise, they argue, problems in improvement work will most probably occur [25].

**In summary**, there is no universally accepted definition of quality in healthcare. What is regarded as quality of care depends on the individual’s perspective and how they value certain aspects. Therefore, the dimensions of quality of care are divergent. Often dimensions are complementary and can be combined in improvement work. However, tensions between different dimensions of quality occur, for example, between improving patient-centeredness and efficient organization. Such tensions need to be balanced between the different stake-

holders <sup>[25]</sup>. A better understanding of the definitions and conceptualisation of quality of care facilitates a better comprehension of the potential disconnection between healthcare system levels (macro, meso, micro), positions (patients, payers, supervisors, professional bodies, etcetera), organizational levels (supervisory board, executive board, unit directors, healthcare professionals), medical disciplines (surgery, maternity, etcetera), professional groups (physicians, nurses, etcetera) and positions (patients, payers, managers, professionals, etcetera).

I assume that this potential disconnection also influences improvement work and the goals healthcare professionals value the most. The differences produce mixed opinions of what traits should be changed and which methods can or must be used to improve quality of care. Healthcare professionals working on quality improvement must learn to balance these tensions in their work. In this thesis, I try to share more insights into this challenge.

## **1.3 Drivers of quality care improvement in the Netherlands**

This section explains the most important (external) influences that drive quality improvement in the Netherlands. The purpose is to provide an understanding of what is mandatory or common in the Dutch healthcare system for quality improvement. Who influences in which way healthcare professionals and managers in their attempt to improve quality of care and optimise efficiency of the organization? Sometimes the improvement aim or improvement methodology used on the micro level is influenced by the macro level (national and intermediary organizations) and/or meso level (Board and management). First, I explain various laws and legislation in the Netherlands concerning quality (§ 1.3.1). Second, I focus on the role of transparency and self-assessment in the Dutch system in relation to quality improvement work (§ 1.3.2) and third, I discuss the influence of the market-based system on quality improvement (§ 1.3.3). Finally, I outline the national quality improvement programmes that were running while I conducted the research for this thesis (§ 1.3.4).

### **1.3.1 Legislation and quality management systems in hospitals**

Several healthcare quality laws have steered the quality agenda of healthcare organizations and healthcare professionals since 1993 <sup>[26]</sup>.

The patient's rights to good quality of care are regulated by law. The **Medical Treatment Agreements Act** (WGBO, 1995) expresses the requirements for informed consent from and privacy protection of patients. The **Clients' Right of Complain Act** (WCKZ, 1995) stipulates the right to complain and defines the requirements of a complaints procedure. The **Participation by Clients of Care Institutions Act** (WMCZ, 1996) mandates establishing councils that act on behalf of all patients for hospitals involved in major policy decisions <sup>[27]</sup>.

For the quality of hospital care the Individual Healthcare Professional Act (BIG, 1993) and the Healthcare Institutions Quality Act (KZI, 1996) are the most relevant <sup>[27]</sup>.

The **Individual Healthcare Professional Act** law concerns promotion and monitoring of the quality of the provision of healthcare services by individual healthcare professionals. The BIG registry is a tool to register work experience and educational requirements for individual healthcare professionals. Physicians, pharmacists, midwives, nurses, physiotherapists, psychotherapists, psychologists and dentists need to re-register to practice their profession independently. This law protects patients from careless or incompetent treatment of healthcare professionals.

The **Healthcare Institutions Quality Act** law stipulates that healthcare institutions must deliver responsible care on the basis of controlled self-regulation. To realise this, institutions have to organize their services in a certain way and give systematic attention to the monitoring and control (i.e. measurements evaluated against explicit standards or goals) and improvement of quality of care <sup>[28]</sup>. Therefore an integrated quality management system <sup>[29]</sup> needs to be in place to assure and improve quality of care.

### **1.3.2 Self-assessment and transparency**

Dutch laws concerning quality do not always specify detailed requirements, but several laws do contain evaluation clauses calling for regular self-assessment and monitoring of the implementation in the hospital of the set requirements. For (self-)assessment of quality of care, the sector developed schemes for accreditation of hospital care and, for several professional groups, visitation schemes. Voluntary peer-to-peer hospital accreditation is run by the Dutch Institute for the Accreditation of Care Organizations (**NIAZ**, founded in 1989) <sup>[30]</sup>. Visiting programmes (Visitatie) have been established to assess hospital care, professionals, and some departments (e.g. ICU, dialysis). On behalf of their medical scientific association or professional body, peers visit each other to evaluate the quality of care and organization of the work. Participation in visitation is required

for the recertification of physicians.

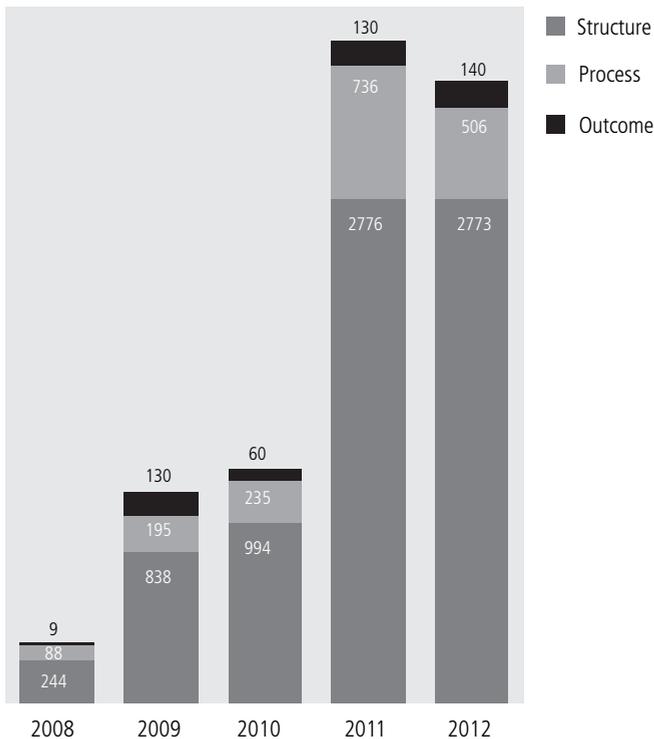
In both hospital accreditation and the visitation programmes, the main criterion is that the one being reviewed should be open to learning. Therefore, both reviewer and reviewed require a climate of trust in which feedback and opportunities for improvement can be shared.

An evaluation carried out in 2002 on Dutch healthcare quality laws showed that little progress had been made on implementing an integrated quality system at hospital level that covered the various quality aspects mentioned by several laws [28,29]. Following the recommendations arising from this evaluation, the Minister of Health made a quality management system compulsory. The Minister of Health stipulated that a quality of care strategy should be based on objective measures (e.g. outcome of performance indicators, and alignment with multidisciplinary evidence-based guidelines). The Minister also ordained that quality of care measurements should be transparent to every citizen.

In addition, the Dutch Healthcare Performance Report 2010 showed that the quality and price of healthcare services vary substantially among healthcare organizations and even professional groups [31]. The authors expressed the need to reduce this variation in quality, starting with more compulsory and voluntary performance assessment based on indicators.

Therefore, **performance indicators** have played an important role since 2002 in creating transparency in the quality of care. In five years, the number of mandatory performance indicators for which hospitals must submit data increased tenfold, from 340 to 3400 (see figure 1.1) [32]. This rise in indicators is a result of divergent demands of the different actors in the Dutch healthcare system (see also § 1.3.3). Each actor uses his own performance indicators and definitions (numerator and denominator) to assess quality of care. Sometimes the differences in the definitions are slight but ask for extra registration by healthcare professionals; for example using different logistic time frames to monitor access to care. Hospitals and healthcare professionals complain about the administrative burden of these indicators [33] and try to find their way in setting priorities for their improvement agenda [34].

The assumption in the Dutch healthcare system is that transparency (resulting from reports on performance indicators) steers quality improvement. Healthcare professionals and managers should be triggered to improve the quality if the criteria of the performance indicators are not met. Transparency should support patients to choose the best quality of care and drive the need to improve quality of care when patients choose to go elsewhere [35]. However, due to the huge number of performance indicators it is hard for patients, healthcare professionals and managers to critically assess the quality of care. Websites like [www.kiesbeter.nl](http://www.kiesbeter.nl) try to support the information on performance indicators. Recently the Dutch



**Figure 1.1** Number of performance indicators

Association of Hospital Care and the Dutch Patient Federation developed an online quality window, so that each hospital can be assessed on quality at a glance <sup>[36]</sup>.

Since 2007 patient experiences need also to be assessed systematically with a validated measurement instrument. In addition, patient-reported outcomes (PROMs) as self-reported health outcomes related to the received care are introduced to assess the quality of care.

### 1.3.3 Market-based regulation

Since 2006 the Dutch national healthcare system has been under reform, shifting to a system based on market principles <sup>[37]</sup>. The aim of reform is to move to a healthcare system based on durability, solidarity, choice, quality, and efficiency by regulating competition between market forces <sup>[38]</sup>. This reform has changed the role of different actors in the system. In this semi market-based system, each actor has been given the right to set their own priorities, goals and aspirations for the quality of care. Dutch hospitals have had to cope with the changing demands

of the different actors <sup>[39]</sup>.

As stated in the previous section, **patients'** opinions of received quality play an important role in the transformation of healthcare. Providing patient-centred care is important if hospitals must compete for patients. Patient representative organizations also play a role, by providing all sorts of rewards for good quality. For example the Pink Ribbon awards for high quality breast cancer care <sup>[40]</sup> or smileys for children-friendly hospitals <sup>[41]</sup>. The assessment of quality of care is organized differently, based mostly on the results of indicators combined with a questionnaire; sometimes data is collected on a site visit and/or combined with patient-experience monitors <sup>[40]</sup>.

The **health insurance companies** (are supposed to) act as patients' advocates, demanding high quality at low cost. Information about the purchase of high quality healthcare at a competitive rate in the market, between insurers and healthcare organizations, is embedded in the Dutch Health Insurance Act (ZVW, 2006). Health insurance companies stipulate quality of care requirements in the agreements with healthcare organizations (e.g. on minimum patient volume for physicians to remain skilled enough). In 2014, a public debate started on whether health insurance companies could decide on behalf of their patients which hospital would provide the best care and therefore limit the freedom of patients to choose their healthcare professional.

In the Dutch healthcare system the **Healthcare Inspectorate** (IGZ) is responsible for ensuring adherence to quality and safety regulations. The Healthcare Inspectorate investigates calamities and structural complaints about healthcare organizations. For the last ten years the Healthcare Inspectorate also initiates – sometimes directed by the Minister of Health – thematic reviews on specific quality problems. Since 2013, the Healthcare Inspectorate has been shifting over to more risk-based supervision of hospitals <sup>[42]</sup>. The Healthcare Inspectorate has the power to put hospitals under direct supervision when quality is too low and there are no improvement efforts. In this respect the Healthcare Inspectorate influences the improvement agenda of hospitals and healthcare professionals.

Governmental restrictions came in to guard the market competition between healthcare organizations. In 2006, the **Dutch Healthcare Authority** (NZa) was established to serve as the supervisor for all three healthcare markets: the market between healthcare providers and insurance companies; the market between insurance companies and citizens/patients; and the market between healthcare providers and patients. One of the aims of the NZa is “to promote quality by setting those market conditions that encourage quality and innovation in healthcare” <sup>[43]</sup>. In addition, in 2014 the **National Institute for Healthcare Quality**

(Het Kwaliteitsinstituut) was established as a central body to accelerate the process of quality improvement based on evidence-based knowledge.

Thus, six stakeholders in the Dutch market-based system are important actors in steering the improvement aims of healthcare professionals and managers: the patient, the Healthcare Inspectorate, health insurance companies, professional bodies, Dutch Healthcare Authority and National Institute for Healthcare Quality.

### **1.3.4 National programmes for improvement work**

Quality improvement work in Dutch hospitals is largely organized in improvement projects. Project teams of healthcare professionals are set up with a specific task or improvement goal. Various change methods to improve quality of care are used and most hospitals combine several methods. For example, research shows that 98% of hospitals use multiple approaches to optimise patient logistics' 39% use five or more approaches<sup>[44]</sup>.

Hospitals receive support for their quality improvement work from consultancy firms, professional associations, and national improvement programmes. Especially worth mentioning is the Dutch Institute for Healthcare Improvement CBO (founded in 1979), which plays an important role in translating quality improvement methods and techniques from outside the Netherlands<sup>[45]</sup>. The CBO collaborates with the Institute of Healthcare Improvement from the United States of America<sup>[46]</sup> and the UK National Health Service Improving Quality Centre<sup>[47]</sup>. The Dutch Institute for Healthcare Improvement CBO supported several Breakthrough projects, wherein the Plan-Do-Check/Study-Act rapid cycle improvements method is used (see § 2.5.2).

In 2003 a hospital quality improvement collaborative was launched: **the Faster Better programme** (Sneller Beter). The aim of the Faster Better programme was to set up a group of 24 hospitals as the 'leading coalition'<sup>[48]</sup> to change the Dutch healthcare system by setting goals for more patient-centred, safe and efficient healthcare. Each of the participating hospitals began a bombardment of quality improvement projects, aiming to change the infrastructure and culture of the hospitals, thus setting up the preconditions for continuous improvement of quality<sup>[49]</sup>. The Breakthrough methodology was used to achieve substantial improvements in the areas of logistics, safety and patient participation. During a two-year period a group of eight hospitals was expected to take part in a minimum of 15 projects. All the projects were based on best practice and the latest scientific insights. The ultimate goal of this programme was to change the culture and structure of hospitals.

A national improvement programme for all hospitals was set up for patient safety from 2008 till 2012: The **VMS Security programme** (Veiligheidsmanagement systeem). The programme emerged after the publication of 'Accidental Harm in Dutch Hospitals' in 2007 <sup>[50]</sup>. This report was based on a retrospective patient record study and close investigation of the records of patients who had died in hospital <sup>[51]</sup>. The research showed that 5.7% of the patients suffered from adverse events and preventable harm during their admission, an estimated 1735 avoidable deaths in Dutch hospitals <sup>[52]</sup>.

In 2013 the Minister of Health added to the quality laws the requirement of a **safety management system** <sup>[53]</sup> in the quality management system. During a four-year safety programme, hospitals had to develop a safety management system based on four pillars: policy, culture, risk assessment, and continuous improvement. At the same time, hospitals worked on ten safety improvement projects in the aforementioned VMS Security programme <sup>[53]</sup>, which were supposed to cut costs and simultaneously improve the quality <sup>[54]</sup>. Several collaboratives between hospitals were set up to support the attempt to improve knowledge and share examples arising from the improvement work in the participating hospitals.

**In summary**, this section elaborated on the drivers from the macro level that influence the objectives for improvement in hospitals (meso level) and for healthcare professionals (micro level). Several laws regulate quality of care for both healthcare organizations and healthcare professionals. In the Dutch semi market-based system, outside pressure is a dominant factor in setting the agenda for quality improvement work. Healthcare professionals must cope with increasing and sometimes divergent demands of patients/representative organizations, health insurance companies, professional bodies, the Healthcare Inspectorate and Dutch quality institute. Governmental demands, sometimes described in law, ask for a systematic approach to increase the performance on quality (including safety) and decrease the costs. Indicators and self-assessment play an important role in providing the transparency asked for. Improvement work is supported by national programmes. The next section explains more about the idea of continuous work on quality improvement. Chapter 2 shares scientific knowledge on specific methods for continuous improvement (see § 2.5).

## 1.4 Quality improvement methodology

This section explains the quality improvement methodology and practices currently used in the Netherlands. The historical origins and evolution of quality improvement practices changed since 1850 when Florence Nightingale began the work on continuous quality improvement in healthcare during the Crimean War <sup>[55,56]</sup>. Senge calls these changes in quality improvement work 'evolutionary waves' <sup>[57]</sup>: "Historically, healthcare has focused on quality assurance (a system for evaluating the delivery of services or the quality of products) and quality control (a system for verifying and maintaining a desired level of quality)" <sup>[58 p. 736]</sup>. Checking for defects and recommending changes without having methods to actually change things is not enough to improve healthcare. In this thesis, the improvement of quality by performing improvement work is the focus. Therefore, quality assurance tools (licensure efforts, developing standards and guidelines, certification) are not included in this research.

This section briefly describes the origins (§ 1.4.1) and definition (§ 1.4.2) of continuous quality improvement. Followed by the success factors and barriers described in literature (§ 1.4.3).

### 1.4.1 History of continuous quality improvement

The ultimate aim of the quality improvement paradigm is that a process of continuous improvement of daily practices should be up and running. This originates from the late 19th century when literature became available on continuous quality improvement <sup>[59]</sup> from a scientific, managerial <sup>[60,61]</sup> and practice perspective <sup>[62]</sup>. Especially the literature in the field of Operations Management and Innovation Management in industry embraced the concept of continuous quality improvement <sup>[63]</sup>. Since the 1950s, literature on quality improvement in healthcare is available. First this focused on measurement and data analysis (statistical process control), and trying to establish objective improvements on well-defined problems <sup>[64]</sup>. Later on, quality improvement came more in the hands of 'workers' instead of quality inspectors. Deming captured the spirit of collaboration in an organization working on better quality as "putting everybody in the company to work to accomplish the transformation" <sup>[64 p. 23]</sup>. Due to this shift to 'workers', continuous improvement of processes was emphasised more than solving problems. Methods that provide **small (incremental) changes**, known as Plan-Do-Check-Act improvement cycles, were used for quality improvements work done by the 'workers'. In this decade, the Juran Institute developed quality

improvement tools and educational programmes to develop ‘workers’ [65, 66]. These tools focused more on understanding undefined problems, clarifying the relations between things and assessing alternative ways to organize or produce. In the 80th The Plan-Do-Check-Act cycle changed into the **Plan-Do-Study-Act improvement cycle**, emphasising the need to work with small (incremental) changes [67]. The notion arose that quality improvement could best be done using experiments in daily practice. Small pilots tested ideas for optimising processes and activities in small iterative steps [68]. Actual improvements could be determined by monitoring the experiments with data, thus gaining understanding if improvements in one area led to a decrease of quality in other – also significant – areas.

## 1.4.2 Definition of continuous quality improvement

Batalden and Davidoff describe continuous quality improvement as “the combined and unceasing efforts of everyone – healthcare professionals, patients and their families, researchers, payers, planners and educators – to make the changes that will lead to better patient outcomes (health), better system performance (care) and better professional development” [69 p. 2]. They added **employee development** to the definition of quality improvement. Short and Rahim [70] term continuous quality improvement in healthcare as “total quality management” and say that it could be applied to facilitate operations to improve care services and outcomes. Thereby they focus on the process of quality improvement. Other definitions often imply continuous improvement as an **integral part of daily work practices**. In this thesis continuous quality improvement is defined as the systematic process of ongoing, incremental, and company-wide change of existing practices aimed at improving hospitals’ quality performance planned and organized by professionals and management [71,72].

Three key assumptions are inherent to the notion of continuous quality improvement. First, that improvement is always possible, but the literature shows that this is not easy to achieve [73]. Second, that when ‘workers’ continuously work with these methods, the quality of care and the delivery of care will both improve. Third, that ‘workers’ are motivated to work on quality improvement and have the intrinsic intention to perform well. One can question if these assumptions are right. The problem with continuous quality improvement is that, at first sight, it looks like a simple concept, but in practice, it is hard to ‘design’ improvement, change people’s opinions, and behaviour and redirect the system. The process of continuous improvements is not easy, as numerous studies have shown [74]. Over the years, researchers have tried to reveal the underlying causes

of these difficulties and find ways to counter the problems. Their answer was to add more preconditions and focus on **the role of leadership and an improvement culture**. Short and Rahim <sup>[72]</sup> described continuous improvement as “a method of leadership and management that:

- Defines total quality management as customer perceptions as well as the content and delivery of care services.
- Analyses systems for errors and variation rather than blaming people.
- Develops long-term relationships with suppliers.
- Uses accurate data to analyse processes and measure system improvement.
- Sets up effective collaborative meetings as the basis of teamwork.
- Trains supervisors and managers in leading the ongoing improvement process.
- Engages staff in setting targets and ensures feedback on results.
- Highlights the need for senior executives to plan strategically.
- Achieves long-term improvement through small incremental steps” <sup>[75 p. 390]</sup>.

Short’s description clearly shows how much is at stake to have an ongoing process of improving quality of care. It is not easy to obtain sustainable results and even more important get the ‘wheel’ of continuously improvement running. This thesis aims to add to the body of knowledge on quality improvement by looking at this process of continuous quality improvement work from a learning perspective (for more information see § 2.4 and § 2.5).

### 1.4.3 Success factors and obstacles

By identifying what helps or hinders improvement work, we can gain a better understanding of its effectiveness. Reports of the effectiveness of improvement work are inconsistent and patchy in the literature <sup>[76]</sup>. In his article, “Improving the Quality of Healthcare: What’s taking so long?” Chassin states that the quality improvement effort “relies too heavily on older improvement methods that are proving to be ineffective in attacking many of the complex problems facing today’s healthcare” <sup>[76 p.1762]</sup>. In addition, the quality improvement literature is omnifarious and sometimes immature, due to the lack of rigour. “The improvement field is replete with examples of interventions, initiatives, and programmes that worked well in some settings, but floundered when introduced elsewhere” <sup>[77 p.1]</sup>. Thus, there is a great deal of evidence available based on case studies, describing one particular method for quality improvement what worked well in this context. As mentioned earlier, most articles describe only the ‘content’ of improvement using

data from the pre- and post-test situation. The used improvement approach and the change process are seldom described in detail. This section describes them according to the strongest evidence level: systematic reviews of what is known about the success/failure of quality improvement processes in hospitals. In this overview the information is general and not very specific.

Hughes <sup>[78]</sup> conducted a review on **what is needed to work with quality improvement methods**. Her review of 126 articles reporting strong evidence, based on methodologically rigorous research, she found 11 relevant themes:

1. Strong leadership commitment and support for healthcare professionals to empower them in their active involvement in the improvement work. Leaders can be formal management, but also professionals regarded as champions in their organization.
2. An improvement culture which rewards improvement work and provides healthcare professionals with required resources, including protected time to work on improvements.
3. Involvement of all stakeholders from participating units/wards in improvement teams.
4. Multidisciplinary teams working closely together on improvement aims, using quality improvement strategies and communication strategies, such as face-to-face meetings, conference calls, and internet-based technologies.
5. Utilise guidance by trained facilitators/ expert faculty throughout the process.
6. Consensus on the root causes of the problems, the improvement aim (there can be multiple purposes at stake) and a universally agreed upon metric to gather valid data.
7. Continuous quality assessment and monitoring by collecting and analysing data. Results on performance indicators must be communicated across the whole organization.
8. A proven and methodologically sound change approach, which combines different quality tools in an interrelated manner.
9. Flexible implementation plans, which can be adapted during the improvement process.
10. Available technology to support team functioning, reduce human error and improve quality of care.
11. Change takes time, so it is important to stay focused and persevere.

Kaplan et al. <sup>[79]</sup> conducted a systematic review of the influence of context on quality improvement. Despite the lack of a clear definition of contextual factors

in most articles, they included 47 articles in their review. Consistent with organizational change theories, they found strong evidence for the following context factors:

- Leadership from top management.
- Organizational culture.
- Data infrastructure and information systems.
- Experience with quality improvement work.

Potentially important factors are the involvement of the physician in improvement work, motivation of the involved healthcare professionals to change, resources (time, funding, general resources) to work on quality improvement and team leadership. They conclude that contextual factors related to developing healthcare professionals could not be determined as contributing to quality improvement, although research has been done in this field (they included ten articles). The most frequently examined factor in these articles was the presence of quality training programmes. Only two articles found positive associations for this <sup>[80,81]</sup>. The assessment of quality improvement skills showed a significant correlation on quality improvement success in only 43%. One study <sup>[82]</sup> found a positive association between quality improvement success and the ability to implement best practices. The authors found no correlations for the ability to identify best practices (the 'what' or content of improvement).

The literature contains reports of many successful improvement projects and only some descriptions of the obstacles. An overview of the most important obstacles gives us better insight into the challenges improvement teams encounter. Dixon-Woods et al. conducted a review in 2012 on **commonly faced challenges in improvement work** <sup>[77]</sup>. In a study of 14 evaluations of quality improvement programmes, they identified ten challenges:

1. Convincing people that there is a problem. Use solid data to demonstrate the problem, narrate patient stories for emotional engagement and to stimulate debate and discussion among professionals.
2. Convincing people that the chosen solution is the right one. Again, use facts and figures and the guidance of respected senior clinicians.
3. Getting data collection and monitoring systems right. This is time consuming and sometimes requires external support and training of employees.
4. Access ambitions to realistic achievable goals and 'project readiness'.
5. Organizational context and culture (must) support learning and development, and the development of capacities of employees.

6. Preventing tribalism due to a lack of ownership and professional boundaries. Setting responsibilities and roles, especially for training staff.
7. Leadership that sets out a vision and engages employees with explanation and gentle persuasion.
8. Relying on intrinsic motivation and balancing commitment through incentives and judiciously used (potential) sanctions.
9. Securing sustainability by not depending only on projects and individuals, but by embedding improvements in routines and retaining them in written standards or guidelines.
10. Considering the side effects of change or even unwanted consequences and be willing to adapt.

The authors <sup>[77]</sup> argue that these challenges cannot be avoided, but need to be recognised and dealt with flexibility, with long-term dedication and patience. They call for building coalitions of multidisciplinary teams to gain consensus on the goals and engagement of hospital leaders. They underline the importance of resource requirements (time, competence of professionals involved, and support) to work on quality improvement. Finally, this review shows that taking the time to get an intervention's theory of change, measurement plan and stakeholder engagement right will lead to enthusiasm, momentum, and profound results.

All reviews stipulate the importance of **including healthcare professionals** in improvement work and of engaging employees of all departments and disciplines involved. All three systematic reviews mention the **role of developing knowledge and skills of healthcare professionals**. All three found modest or no correlations for the combination of development of healthcare professionals and success of quality improvement work. Hughes <sup>[78]</sup> suggests that important factors influencing the success of quality improvement projects are the **availability of trained facilitators/expert faculty and using communication strategies to support collaborative learning**. Kaplan et al. <sup>[79]</sup> conclude that no correlation exists between development programmes of healthcare professionals and successful quality improvement work. Dixon-Woods et al. <sup>[77]</sup> conclude that a learning culture to support the development of employees is important, but do not find evidence for the learning as such.

In conclusion, Kaplan et al. consider that "the literature review revealed that the current body of knowledge is in an early stage of development" <sup>[79 p. 521]</sup>. All three reviews call for more research in this area, especially with more rigorous methods for determining the results of quality improvement and descriptive research to understand more about 'how to improve' and correlating factors. In this thesis this is the main topic of research.

**In summary**, continuous quality improvement in healthcare originates from the mid-20th century. Continuous quality improvement is defined as the systematic process of ongoing, incremental, and company-wide change of existing practices aimed at improving hospitals' performance, planned and organized by professionals and management. The literature on getting the 'wheel' of continuous quality improvement turning is concise. In addition there is no literature on the 'best' change methodology used in improvement projects. The available systematic literature reviews see the skills and knowledge of healthcare professionals to improve their daily practice as a key element. More research on this topic is needed.

## **1.5 Aim and research question of this thesis**

Section 1.3 of this chapter showed how, especially for the delivery of hospital care, external demands have increased over the past 20 years. Healthcare professionals working in hospitals need to improve daily practice in order to meet:

- The standards of professional bodies.
- The requirements of healthcare insurance companies.
- Quality assurance targets of the government.
- The efficiency and effectiveness targets of management.
- The demands of patients and their relatives.
- The demands of the Healthcare Inspectorate.
- Public opinion calling for more patient-driven care.

Hospital managers are striving to incorporate quality improvement work into the daily practice of every healthcare professional to get the 'wheel' of continuous quality improvement going.

A tremendous body of knowledge is available on quality improvement work. Nevertheless, sustainable quality improvement remains difficult to accomplish as numerous studies have shown. Shojana and Grimshaw wrote about the current knowledge on quality improvement: "Many quality improvement efforts aim to close the gaps between clinical research and practice. However, in sharp contrast to the paradigm of evidence-based medicine, these efforts often proceed on the basis of intuition and anecdotal accounts of successful strategies for changing provider behaviour or achieving organizational change" [2 p. 138]. They argue that more research is needed on the 'how-to' of improvement work and gaining more

understanding of appropriate interventions to change daily practice. Buist and Middleton <sup>[83]</sup> add to Shojana and Grimshaw's emphasis on the importance of 'how-to' knowledge and call for more insight into the best way to develop professional skills on this. They say that healthcare professionals need to become more competent in quality improvement work in order for them to take ownership of the quality and safety agenda. Smid <sup>[84]</sup> states that professionals have an intrinsic motivation and drive to become 'good' at their job and are committed to shaping their professional development. Smid sees personal development of professionals as maturation, a prolonged learning and socialization process, in which professionals learn step-by-step, from zone to zone growing into both the content of their work and the 'rules' of the social environment. "They [professionals] try to be good in their field, learn widely and deeply, observe well, judge well and want to have an appropriate and varied repertoire." <sup>[84 p.11]</sup>. To gain more understanding about how to support healthcare professionals in their quality improvement efforts, I want to add also the social context of their work to the existing knowledge on the learning processes of healthcare professionals in relation to quality improvement work.

The overarching research question of this thesis is:

***Which issues support and hinder the development of healthcare professionals working in hospitals to perform improvement work?***

The research question can be answered at three levels of the healthcare system: (macro) system context level, (meso) organizational level, and (micro) clinical/professional level.

For the **macro context level** of the healthcare system, the most important challenge is to understand how healthcare professionals are influenced, supported, and steered in their quality improvement work. This raises the following research question:

1. *How do macro level organizations with an intermediary role in the Dutch healthcare system influence the development of healthcare professionals to perform quality improvement work at the hospital level?*

On the **meso organizational level** it is important to understand how healthcare professionals can be supported to perform quality improvement work. Developing the knowledge and skills of healthcare professionals is seen as the most influential element for continuous quality improvement <sup>[77-79]</sup>. Therefore more insights must be gained into the educational approaches that contributed

to the short-term improvement goal and the long-term education of professionals to improve their daily practices. Articles detailing the effectiveness of the educational approach of improvement work are scarce in the literature <sup>[85,86]</sup>. Quality improvement work in the Netherlands is mostly done in improvement projects using the Breakthrough approach with small Plan-Do-Study-Act cycles (see § 2.5.2) <sup>[87]</sup>. Research on the Breakthrough methodology from a learning perspective can best be done by studying a quality improvement collaborative, in which multiple hospitals jointly learn to improve their practice. A quality improvement collaborative forms a temporary learning organization for the exchange of knowledge on quality improvement themes and change methods to the participants, the healthcare professionals improving their daily practice. The change approach is to educate the participants to make changes in their own healthcare organization <sup>[88,89]</sup> (see § 2.5.3). Therefore, the educational approach of a quality improvement collaborative using the Breakthrough approach is interesting to study. This raises the following research question:

- 2. How does a learning environment contribute to the development of healthcare professionals to perform quality improvement work in their own hospital?*

On the **micro clinical or professional level**, more understanding of how healthcare professionals can be supported in their improvement work is needed <sup>[84]</sup>. More insight into the hindering and supportive factors can be gained by studying the processes in which healthcare professionals in hospital learn to improve their daily routines. The following research question guides this research:

- 3. What factors support or hinder the improvement work of healthcare professionals?*

## 1.6 Methodology

This section explains the methods used to answer the overarching research question and the three sub-questions steering the data collection for the research presented in this thesis. This thesis as a whole can be characterised as multiple case studies (§ 1.6.1) using mixed methods, for data gathering and analysis (§ 1.6.2).

### 1.6.1 Case study

Gerring <sup>[90]</sup> defines a case study as “an intensive study of a single unit for the purpose of understanding a larger class of (similar) units (...) to generalise across a larger set of units” <sup>[91 p. 341-342]</sup>. Units refer to a bounded phenomenon observed ‘in the field’ at a single point in time or over a delimited period of time <sup>[92]</sup>. This does not mean that a unit is one case or a small sample <sup>[93]</sup>. Rather, each unit contains multiple cases, otherwise no evidence could be shown for causal propositions. The ‘sample’ of my research comprises four units with several cases in each (see §1.5) and studied at discrete points in time:

1. Hospitals across Europe in QUASER (Chapters 3 and 9).
2. Hospitals joining the Faster Better quality collaborative (Chapters 4–6).
3. A hospital using care pathway methodology to improve healthcare (Chapter 7).
4. A hospital trying to improve hand hygiene (Chapter 8-9).

In this thesis the studied bounded phenomenon is the **support and steering of improvement** work performed by healthcare professionals working in hospitals. Using methods (for more information see §1.6.2) originating from different research methodologies made it possible to study the relative bounded phenomenon of the different cases in depth. The boundaries of a unit can be implicit and ambiguous <sup>[94]</sup>, so this research attempted to make sense of the data collected and of what the researcher found intriguing. For each unit/case, data was collected in several relevant dimensions (‘variables’). For instance, the variable ‘educational approach during national meetings’ was studied in the Faster Better quality improvement collaborative. In each case, data gathering focused on the educational approach aimed at the support and direction of healthcare professionals in their attempt to improve the quality of care. Several cases within units and across several units were studied to “elucidate features of larger class of similar phenomena” <sup>[91 p. 341]</sup> so that scientific knowledge could emerge.

Case studies are useful in addressing ‘**how**’, ‘**what**’ and ‘**why**’ questions <sup>[92]</sup> and are relevant in studying the dynamics of change over a period of time <sup>[95]</sup>. Although the relevance of case studies to study daily practice is acknowledged in organizational and political research, the case study is relatively under-utilised in healthcare services research <sup>[96]</sup>. **Longitudinal case studies** are also uncommon in quality improvement work <sup>[96]</sup>. Baker states that “creating more effective, evidence-based care relies not just on developing and disseminating the evidence, but also on building knowledge of the ways in which improvements can be embedded into ongoing practice. Understanding the structures

and processes of change is as critical as the knowledge of what works” [97 p. 130]. Healthcare case studies on improvement work have already been used to explore improvement of clinical situations in depth [96] and the quality improvement work of nurses [98].

## 1.6.2 Mixed-method research designs

Underlying this case study design is a qualitative research approach. As a researcher I am interested in the meaning of my observations and the underlying assumptions of the people I observe or include. My research was not aimed at testing pre-defined hypotheses, but at generating new theoretical insights (see Chapter 10). In this process of theory building the methodological fit between the studied cases and posed research question is very important [92]. In the various case studies, I chose from **several data collection and analysis methods**, depending on the research question posed. Some case studies combined quantitative data (e.g. questionnaires, surveys) and qualitative data (e.g. observations, interviews, document studies, written accounts by the subjects and/or the researchers). Qualitative data gathering methods are most appropriate for research where theoretical insights are nascent and research questions are exploratory [99]. In this thesis, this applies to almost all the case studies. In only one case study – on participants’ learning preferences – was the theory mature, enabling a survey and statistical testing methods.

The appropriateness of the combination of different types of data is challenging in the current healthcare research paradigm, especially for the action-oriented data gathering used in several cases. In my research I focused on the change approach of quality improvement work from a learning and educational perspective. As I explained in section 1.3.4, quality improvement in the Netherlands consists mostly of project work aimed at discarding poor ideas or pursuing good ideas that work, by performing incremental rapid cycle improvement experiments (see also § 2.5). Healthcare professionals make frequent changes in daily practice during these experiments. Constantly changing practices makes it problematic to study this in the positivism research paradigm, which is common in most medical studies [2]. Varkey et al. [100] describe, from the positivism paradigm standpoint, what is clearly needed for ‘good’ quality improvement research. They call for randomised controlled trials, controlled studies, pre-intervention and post-intervention studies, and time series to understand more about what helps to improve the quality of care. However, this kind of research requires a predetermined, measurable process of change and not a **shifting – sometimes drifting – practice**, which is hard to study in such research designs.

To understand more of the ‘black box’ of quality improvement processes, other more in-depth data gathering methods are needed. Therefore, action-research approaches to collect data are seen as more appropriate. Pawson and Tilley <sup>[101]</sup> argue that we need to adjust scientific methods to understand more about how improvement efforts are influenced by the context and vice versa. Pawson and Tilley <sup>[101]</sup> and Berwick <sup>[102]</sup> suggest using scientific methods that go beyond the classic ‘successionist’ format that dominates the usual scientific toolkit of evidence-based medicine. Berwick states, “Many assessment techniques developed in engineering and used in quality improvement – statistical process control, time series analysis, simulations, and factorial experiments – have more power to inform about mechanisms and contexts than do RCTs, as do ethnography, anthropology, and other qualitative methods. For these specific applications, these methods are not compromises in learning how to improve; they are superior” <sup>[102 p. 1183]</sup>. Pawson and Tilly <sup>[101]</sup> suggest using the alternative CMO model: context – mechanism = outcome, to gain more understanding of the reasons behind and consequences for practice. Applying action-research methodology approaches made it possible to form complex relationships that underline healthcare improvement practices and the way healthcare professionals are supported or steered in educational settings <sup>[103]</sup>. Understanding of the relationship between those two ‘variables’: **improvement work and education of healthcare professionals**, cannot be gained by looking at these as two independent objects. They must be studied as a coherent and influencing system <sup>[104,105]</sup>. Collecting action-research data required collaboration with practitioners in real-life situations to address problem situations and simultaneously gain insights <sup>[106]</sup>, thereby obtaining new knowledge on what works in a particular setting.

The methods used in every case study are accounted for in each chapter (based on [published] articles). In the final chapter the contribution to the body of knowledge on quality improvement is shared in a cross-case analysis that goes beyond the single units.

## 1.7 Structure of this thesis

The chapters of this thesis guide the readers through the research done on quality improvement. In the past six years data was gathered in four case studies.

Chapter 2 starts off with an **introduction to the learning perspective** and the relationship between learning and quality improvement.

Chapter 3 concerns the **macro context level** in the healthcare system, where macro level organizations with an intermediary role in the healthcare system in their attempt to influence quality improvement work on meso and micro level were studied. To answer the research question multi-level, longitudinal, comparative data from the QUASER study was gathered <sup>[23]</sup>. In this research we tried to create a better understanding of hospitals' quality improvement efforts in five European countries: England, Norway, Sweden, Portugal and the Netherlands. In a cross-national qualitative study based on document analysis and semi-structured interviews we explored how organizations with an intermediary role apply three commonly used quality improvement methods – accreditation, quality improvement guides, and performance indicators – to support, influence and steer improvement work in hospitals.

Chapters 4–6 are concerned with the **meso organizational level**. Several educational aspects of Faster Better, a Dutch quality improvement collaborative, were studied. Faster Better involved 24 Dutch hospitals aiming to improve patient logistics, patient safety and patient-centeredness <sup>[49,107]</sup>.

To understand the nature of the temporary learning organizations in Faster Better, two studies were done. First, a literature-based framework was developed for the five key challenges that a learning organization faces. Using action-research data collected in four hospitals we mirrored the Faster Better approach on these five challenges. See Chapter 4 for more information and the findings.

Second, we studied whether the Faster Better educational approach matched the preferred learning style of the participants. To assess the **learning styles** we used a survey developed by Ruijters and Simmons <sup>[108,109]</sup>. Next, we studied the match of educational components offered in the quality improvement collaborative with the preferred learning style of the participants. Then, we conducted action research in four hospitals to understand how this match influences the quality improvement work in hospitals. See Chapter 5 for the findings.

Third, we studied how Faster Better contributed to the **transfer of skills** needed to perform quality improvement work. We did a Delphi study to inquire about the skills needed for logistic improvement work. Building on the Delphi study outcome, we asked participants in two Faster Better logistics collaboratives to rate these skills on a five-point Likert scale to assess the importance of each skill, the availability of skills in their team and the increase in these skills during the quality improvement collaborative. Next, we held an expert meeting to interpret our findings and formulate hypotheses about the way collaboratives can be improved. See Chapter 6 for the article on this study.

Chapters 7–9 describe the research on the **micro healthcare professional level**. Two topics were studied. The first was a commonly used improvement approach: care pathways and the second was an improvement topic; Healthcare-Associated Infections.

Chapter 7 contains an article on a programme aiming to improve patient-centeredness, increased adherence to evidence-based care and changes to the organizational and logistic performance of hospitals by developing **care pathways**. Which frictions occur during the development and implementation of care pathways was studied.

Chapters 8 and 9 share **more in-depth knowledge** on a quality improvement work on specific topic: **healthcare-associated infections** – or nosocomial infections – that patients contract after admission to hospital. Examples of healthcare-acquired infections are urinary tract infections, surgical site infections, ventilator-associated pneumonia, and septicemia. Healthcare-associated infections are persistent problems, which present discomfort, pain, health risks, and the risk of mortality to patients <sup>[110]</sup>. Moreover, these infections result in increased costs for the healthcare system due to longer patient admittance as well as additional costs to the wider economy <sup>[111]</sup>. The literature describes causes of healthcare-associated infections <sup>[112]</sup> and a large range of interventions to reduce them <sup>[113]</sup>. One main cause of the spread of nosocomial infections is non-compliance with hand hygiene by healthcare workers <sup>[114]</sup>. Despite knowledge of the importance of hand hygiene since the days of Florence Nightingale, studies show that healthcare professionals disinfect their hands properly (at the right time in the right manner) only half of the time <sup>[115]</sup>. Clearly this is an important, relevant improvement topic to study, especially since it is a persistent problem calling for more than the traditional education approaches.

In this particular research, we studied the **use of screensavers** to support an internal learning process to improve hand hygiene behaviour in the neonatal departments of an academic hospital. The screensaver displayed gain-framed messages, tapping into the altruistic emotions of healthcare workers (motivating learning), reminding them subconsciously of the importance of hand hygiene. See Chapter 8 for more information on this research.

Chapter 9 presents the findings of a study on healthcare-associated infections improvement work in five European hospitals. This research was part of the multi-level, longitudinal comparative QUASER study <sup>[23]</sup>. The aim of this QUASER study was to create a better understanding of (the effectiveness of) the hospitals' quality improvement effort and the kind of processes that enable European hospitals to achieve improvement results. Therefore we tried to gain in-depth

understanding of quality work by carrying out embedded ethnographic research on improvement work related to healthcare-associated infections. In all five countries we studied commonalities helpful to improvement work and explicated how the European Union can foster cross-hospital and cross-country learning.

## References

1. American College of Healthcare Executives (ACHE), Survey top issues confronting hospitals, 2009. <http://www.ache.org/pubs/research/ceoissues.cfm> Accessed December 22, 2014.
2. Shojania KG, Grimshaw JM. Evidence-based quality improvement: the state of the science. *Health Affairs* 2005;24 (1):138-150.
3. Centraal Bureau voor de Statistiek. Bevolkingsprognose, flexibilization, 2012 <http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLN-L&PA=80748NED&D1=6&D2=a&D3=0-24&HD=111117-1458&HDR=T&STB=G1,G2>. Accessed December 22, 2014.
4. Schut E, Rutten F. *Economie van de gezondheidszorg*. Maarssen: Elsevier Gezondheidszorg, 2009.
5. Boston Consulting Group, 'Zorg voor Waarde', 2011
6. Health Consumer Powerhouse Ltd., Health Consumer Powerhouse. Euro Health Consumer Index, 2013. <http://www.healthpowerhouse.com/files/ehci-2013/ehci-2013-report.pdf> Accessed December 22, 2014
7. [http://www.gezondheidszorgbalans.nl/Projecten/Zorguitgaven\\_en\\_doelmatigheid](http://www.gezondheidszorgbalans.nl/Projecten/Zorguitgaven_en_doelmatigheid) Accessed December 22, 2014
8. <http://www.gezondheidszorgbalans.nl/dsresource?type=pdf&disposition=inline&objectid=rivmp:259618&versionid=&subobjectname=> Accessed December 22, 2014
9. Boer H, Berger A, Chapman R, Gertsen F. *CI changes: from suggestion box to organisational learning*. Ashgate: Aldershot, 2000.
10. Rijnders S, Boer H. A typology of continuous improvement implementation processes. *Knowledge and process management* 2004;11 (4):283-296.
11. ISO, 2001.
12. ISO, 8402-1986.
13. Parasuraman A, Zeithaml VA, Berry LL. *Delivering quality service: Balancing customer perceptions and expectations*. New York: The Free Press, 1990.
14. Donabedian A. The quality of care: how can it be assessed? *Arch Pathol Lab Med* 1997;121:1145-1150
15. Agency for Healthcare Research and Quality, US Department of Health and Human Services. Your guide to choosing quality healthcare: a quick look at quality. <http://www.ahrq.gov/policymakers/chipra/chipraarch/chipra072209/clancy/clancyslide15.html> Accessed December 22, 2014.
16. National Quality Board. *Quality in the new health system*. London: Department of Health, 2013.

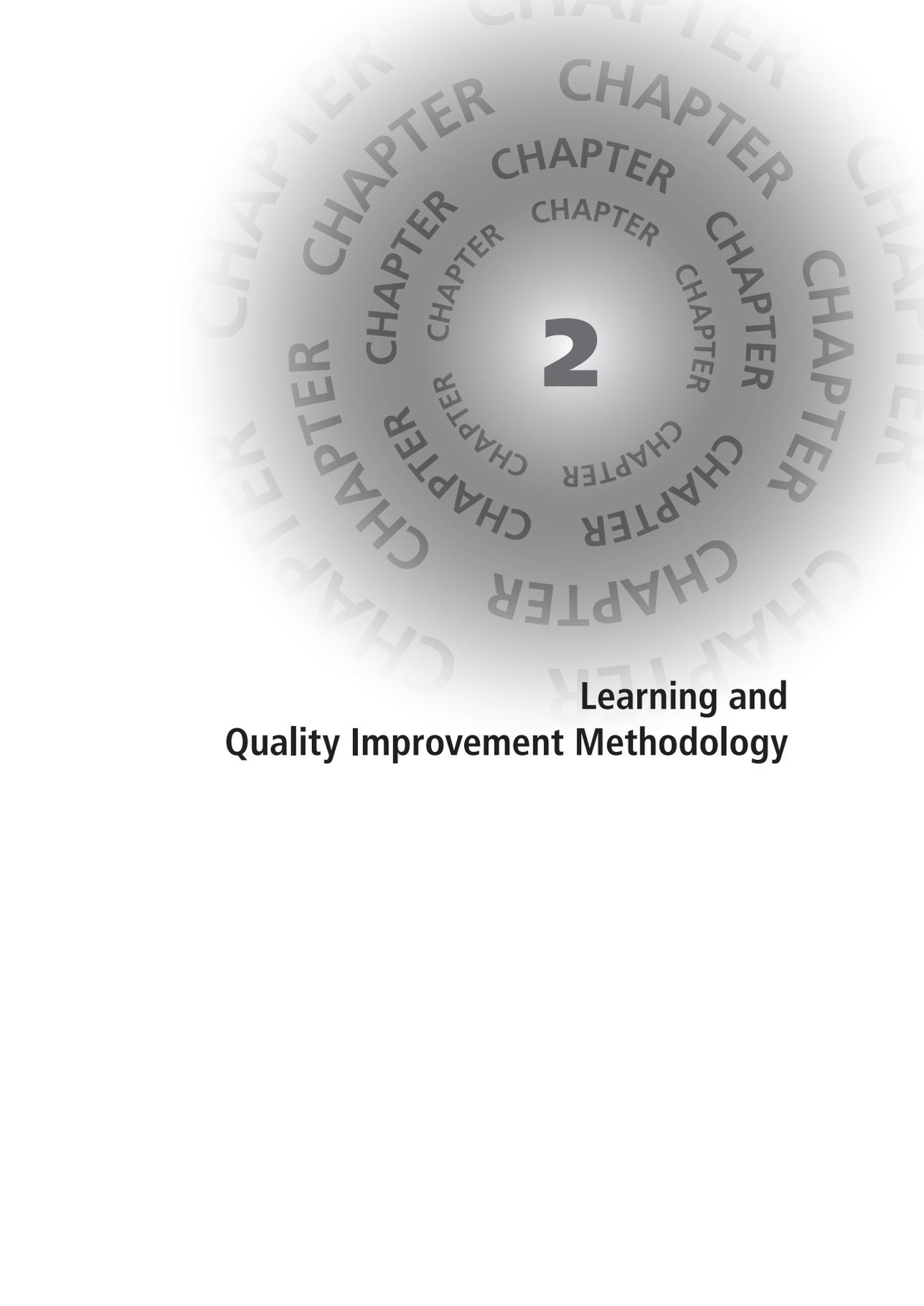
17. Ministerie van Volksgezondheid, Welzijn en Sport. Wet 22113: Kwaliteitswet Zorginstellingen. Den Haag: Tweede Kamer der Staten Generaal, 1990. [http://wetten.overheid.nl/BWBR0007850/geldigheidsdatum\\_22-01-2013](http://wetten.overheid.nl/BWBR0007850/geldigheidsdatum_22-01-2013) Accessed December 22 2014.
18. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press, 2001.
19. Nationale Raad voor de Volksgezondheid, Discussienota begrippenkader kwaliteit van de beroepsuitoefening. Zoetermeer: Nationale Raad voor de Volksgezondheid, 1986.
20. Dey PK, Hariharan S, Despic O. Managing healthcare performance in analytical framework. *Benchmarking: An International Journal* 2008;15 (4):444-468.
21. Swinglehurst D, Emmerich N, Maybin J, et al.. The many meanings of 'quality' in healthcare: interdisciplinary perspectives. Cumberland Lodge, 2013. <http://www.cumberlandlodge.ac.uk/Programme/Recent+events/Quality+in+Healthcare> Accessed December 22, 2014.
22. Swinglehurst D, Emmerich N, Maybin J, et al.. Rethinking 'quality' in healthcare. *Journal of health services research and policy* 2014;19 (2):65-66.
23. Robert GB, Anderson JE, Burnett SJ, et al.. A longitudinal, multi-level comparative study of quality and safety in European hospitals: the QUASER study protocol. *BMC health services research* 2011;11 (1):285.
24. Wiig S, Aase K, Von Plessen C, et al.. Talking about Quality: exploring how quality is conceptualized in European hospitals and healthcare systems. *BMC health services research* 14 (1):478.
25. Health Foundation, Quality Improvement made simple, Second Edition 2013 Londen: The Health Foundation. <http://www.health.org.uk/publications/quality-improvement-made-simple> Accessed December 22, 2014
26. Legido-Quigley H. Assuring the quality of healthcare in the European Union: a case for action (No. 12). World Health Organization, 2008.
27. <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2013/11/01/thematische-wetsevaluatie-bestaursrechtelijke-toezicht-op-de-kwaliteit-van-de-zorg.html> Accessed December 22, 2014.
28. Sluijs EM, Wagner C. Progress in the implementation of Quality Management in Dutch healthcare: 1995–2000. *International Journal for Quality in Health Care* 2003;15 (3):223-234.
29. [http://wetten.overheid.nl/BWBR0007850/geldigheidsdatum\\_22-01-2013](http://wetten.overheid.nl/BWBR0007850/geldigheidsdatum_22-01-2013) Accessed at December 22, 2014.
30. <http://en.niaz.nl/>
31. Westert GP, Van den Berg MJ, Zwakhals SLN, et al.. Dutch healthcare performance report 2010. Rijksinstituut voor Volksgezondheid en Milieu RIVM, 2010.
32. Nederlandse Vereniging van Ziekenhuizen, Strategies in Regulated Markets. Kwaliteit op de Kaart: Ontwikkelingen en resultaten op het gebied van kwaliteit van ziekenhuiszorg, Utrecht: NVZ, 2014.
33. Oerlemans W, Innemee G. Help dokter de zorg verzuip! *Medisch Contact* 2013;41:2082-2084.
34. Blume L, Van Weert N, Kerckamp H. Ruim twaalfhonderd richtlijnen is te veel: Atrium MC inventariseerde alle standaarden en koos de negen urgentste. *Medisch Contact* 2013;10:546-547.

35. The new care system in the Netherlands: durability, solidarity, choice, quality, efficiency- Ministry of Health, Welfare and Sport publication. [www.minvws.nl/](http://www.minvws.nl/)
36. <https://www.nvz-ziekenhuizen.nl/onderwerpen/kwaliteitsvenster-ziekenhuizen>. Accessed December 22 2014.
37. Health systems in Transition: Netherlands, 2010 <http://www.nivel.nl/pdf/HIT-rapport-Netherlands.pdf> Accessed March 5, 2014.
38. Daley C, Gubb J, Clarke E, Bidgood E. Healthcare Systems: The Netherlands, 2013. <http://www.civitas.org.uk/nhs/download/netherlands.pdf> Accessed December 22, 2014.
39. The new care system in the Netherlands; pamphlet produced by the Department of Health, Welfare & Sport [http://www.healthlaw.nl/healthcare\\_reform.pdf](http://www.healthlaw.nl/healthcare_reform.pdf) Accessed March 5, 2014.
40. [http://www.borstkanker.nl/monitor\\_borstkankerzorg](http://www.borstkanker.nl/monitor_borstkankerzorg) Accessed December 22, 2014.
41. <https://www.kindenziekenhuis.nl/professionals/criteria-voor-een-smiley/> Accessed December 22, 2014.
42. [www.igz.nl](http://www.igz.nl)
43. <http://www.nza.nl/organisatie/>
44. Lent WA van, Sanders EM, Harten WH van. Exploring improvements in patient logistics in Dutch hospitals with a survey. *BMC health services research* 2012;12 (1):232.
45. [www.cbo.nl](http://www.cbo.nl)
46. <http://www.ihl.org/Pages/default.aspx>
47. <http://www.nhs.uk/>
48. Kotter JP. *Leading change*. Boston: Harvard Business Press, 1996.
49. Bal, R, Pijnenborg, L. Sneller Beter: een tussen balans. *ZE Magazine* 2007;18 (2):28.
50. Zegers M, Bruijne MC de, Wagner C, et al.. Adverse events and potentially preventable deaths in Dutch hospitals: results of a retrospective patient record review study. *Quality and Safety in Health Care* 2009;18 (4):297-302.
51. Zegers M, Bruijne MC de, Wagner C, et al.. Design of a retrospective patient record study on the occurrence of adverse events among patients in Dutch hospitals. *BMC Health Services Research* 2007;7 (1):27.
52. NIVEL First large-scale European study: Adverse event in 5.7 out of hundred hospital admissions. Utrecht, Netherlands Institute for Health Services Research, 2007.
53. <http://www.vmszorg.nl/>
54. Hoonhout LH, Bruijne MC de, Wagner C, et al.. Direct medical costs of adverse events in Dutch hospitals. *BMC Health Services Research* 2009;9 (1):27.
55. Nightingale F. *Notes on nursing, What it is, and what it is not*. Lippincott Williams & Wilkins, 1863. A reprint by Longman, Robertsand Green, 1992.
56. Brook RH, Avery AD. *Quality assurance mechanisms in the United States: from there to where*. Santa Monica California: Rand corporation 1975;5520.
57. Senge P. *It's de learning: the real lessons of the quality movement*. *The Journal for Quality and Participation* 1999;22 (6):34-40.
58. Varkey P, Reller MK, Resar RK. Basics of quality improvement in healthcare. *Mayo Clinic Proceedings* 2007;82 (6):735-739).

59. Middel R, Op De Weegh S, Gieskes J. Continuous improvement in The Netherlands: a survey-based study into current practices. *International Journal of Technology Management* 2007;37 (3):259-271.
60. Taylor F. A piece rate system being a step towards partial solution of the labor problem. *American Society of Mechanical Engineering Transactions* 1895;16:856-83.
61. Bessant J, Caffyn S. High-involvement innovation through continuous improvement. *International Journal of Technology Management* 1997;14 (1):7-28.
62. Kerrin M. Continuous improvement capability: assessment within one case study organisation, *International Journal of Operations and Production Management* 1992;19 (11):1154–1167.
63. Shewhart WA. *Economic Control of Quality of Manufactured Product*. New York: D. Van Nostrand Co, 1931.
64. Deming WE. *Out of the Crisis*. Massachusetts: Massachusetts Institute of Technology Center for Advanced Engineering Study, 1986.
65. Juran J. *Quality control handboek*. New York: Mc. Graw-Hill, 1951.
66. <http://www.juran.com>.
67. Deming WE. *The New Economics*. MIT Press. Cambridge MA, 1993.
68. Berwick DM. Continuous improvement as an ideal in healthcare. *New England Journal Med* 1989;320:53-56.
69. Batalden PB, Davidoff F. What is “quality improvement” and how can it transform healthcare? *Quality and Safety in Health Care* 2007;16 (1):2-3.
70. Short PJ., Rahim MA Total quality management in hospitals. *Total Quality Management* 1995;6 (3):255-264.
71. Boer H, Gertsen F. From continuous improvement to continuous innovation: a (retro) (per)spective. *International Journal of Technology Management* 2003;26 (8):805-827.
72. Rijnders S, Boer H. A typology of continuous improvement implementation processes. *Knowledge and process management* 2004;11 (4):283-296.
73. Chassin MR. Is healthcare ready for Six Sigma quality? *Milbank Quarterly* 1998;76:565-591.
74. Boer H, Gertsen F. From continuous improvement to continuous innovation, a (retro) (per)spective. *International Journal of Technology Management* 2003;26 (8):805–827.
75. Lee D. Implementation of quality programs in healthcare organizations. *Service Business* 2012;6 (3):387-404.
76. Chassin MR. Improving The Quality Of Health Care: What’s Taking So Long?. *Health Affairs* 2013;32 (10):1761-1765.
77. 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 quality and safety* 2012;21 (10):876-884.
78. Hughes R. *Tools and Strategies for Quality Improvement and Patient Safety*. In: Hughes R. *Patient safety and quality: An evidence-based handbook for nurses*. United States: Agency for Healthcare Research and Quality, 2008.

79. Kaplan HC, Brady PW, Dritz MC, et al.. The influence of context on quality improvement success in healthcare: a systematic review of the literature. *Milbank Quarterly* 2010;88 (4):500-559.
80. Li L X. Relationships between determinants of hospital quality management and service quality performance—a path analytic model. *Omega* 1997;25 (5):535-545.
81. Molfenter T, Gustafson D, Kilo C, et al.. Prospective evaluation of a Bayesian model to predict organizational change. *Health care management review* 2005;30 (3):270-279.
82. Tucker AL, Nembhard IM, Edmondson AC. Implementing new practices: An empirical study of organizational learning in hospital intensive care units. *Management Science* 2007;53 (6):894-907.
83. Buist MD, Middleton SL. What went wrong with the quality and safety agenda? An essay by Michael Buist and Sarah Middleton. *British Medical Journal* 2013;347:f5800.
84. Smid G. Goed werk vraagt om goed besturen. Over professionalisering als hart van besturing. Open Universiteit, 2012.
85. Nadeem E, Olin SS, Hill LC, et al.. Understanding the components of quality improvement collaboratives: A systematic literature review. *Milbank Quarterly* 2013;91 (2):354-394.
86. Nembhard IM. Learning and improving in quality improvement collaboratives: which collaborative features do participants value most?. *Health services research*. 2009;44 (2):359-378.
87. Kilo CM. A framework for collaborative improvement: lessons from the Institute for Healthcare Improvement's Breakthrough Series. *Quality Management in Healthcare* 1998;6 (4):1-14.
88. Øvretveit J, Bate P, Cleary P, et al.. Quality collaboratives: lessons from research. *Quality and safety in healthcare* 2002;11 (4):345-351.
89. Schouten LMT, Thesis Quality Improvement collaborative. Cost-effectiveness and determinants of success. Nijmegen: UMC St Radboud, 2010.
90. Gerring J. Case study research: principles and practices. Cambridge: Cambridge University Press, 2007.
91. Gerring J. What is a case study and what is it good for?. *American political science review* 2004;98 (2):341-354.
92. Yin RK. Case Study Research: Design and Methods. Newbury Park CA: Sage, 1994.
93. George AL, Bennett A. Case Studies and Theory Development. Cambridge MA: MIT Press, 2004.
94. Anderson RA, Crabtree BF, Steele DJ, McDaniel RR. Case study research: The view from complexity science. *Qualitative Health Research* 2005;15 (5):669-685.
95. Denis JL, Langley A, Cazale L. Leadership and strategic change under ambiguity. *Organisational Studies* 1996;17:673e99.
96. Baker GR. The contribution of case study research to knowledge of how to improve quality of care. *BMJ quality & safety* 2011;20 (1):i30-i35.
97. Jacelon CS, O'Dell KK. Case and grounded theory as qualitative research methods. *Urologic nursing*. 2005;23 (1).
98. Benner P. Uncovering the knowledge embedded in clinical practice. *Image: Journal of Nursing Scholarship* 1983;19:36–41.

99. Creswell JW. *Qualitative inquiry and research design: Choosing among five approaches*. Newbury Park CA: Sage, 2012.
100. Varkey P, Reller MK, Resar RK. Basics of quality improvement in healthcare. *Mayo Clinic Proceedings* 2007;82 (6):735-739.
101. Pawson R, Tilley N. *Realistic Evaluation*. London: Sage Publications Limited, 1997.
102. Berwick DM. The science of improvement. *JAMA: the journal of the American Medical Association* 2008;299 (10):1182-1184.
103. Reason P, Bradbury H. *Handbook of action research: Participative inquiry and practice*. London: Sage Publications Limited, 2001.
104. Coghlan D, Brannick T. *Doing action research in your own organization*. London: Sage Publications Limited, 2009.
105. Avison DE, Lau F, Myers MD et al.. Action research. *Communications of the ACM* 1999;42 (1):94-97.
106. Eden C, Huxham C. Action research for the study of organizations. *Handbook of organization studies*. 1996:526-542.
107. Dückers M, Wagner C. *Evaluatie Sneller Beter pijler 3: het interne vliegwiel*. Utrecht: NIVEL, 2007.
108. Simons PRJ, Ruijters MC. 'Learning professionals: towards an integrated model.' In: Boshuizen HPA, Bromme R, Gruber H. *Professional learning: Gaps and transitions on the way from novice to expert*, 207-229. Houten: Springer, 2004.
109. Simons P, Ruijters MC. Varieties of work related learning. *International Journal of Educational Research* 2008;47 (4):241-251.
110. McKibben L, Horan TC, Tokars JI, et al.. The Healthcare Infection Control Practices Advisory Committee, Guidance on Public Reporting of Healthcare Associated Infections: Recommendations of the Healthcare Infection Control Practices Advisory Committee. *Infection Control and Hospital Epidemiology* 2005;26 (6):580-587.
111. Graves N, Halton K, Lairson D, Economics and Preventing Hospital-Acquired Infection: Broadening the Perspective. *Infection Control and Hospital Epidemiology* 2004;28 (2):178-184.
112. Autemaniere A, Cunat L, Diguio N, et al.. Factors determining poor practice in alcoholic gel hand rub technique in hospital workers. *Journal of Infection and Public Health* 2010;3:25-34.
113. Pittet D, Hugonnet S, Harbarth S, et al. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *Infection Control Programme. The Lancet* 2000;356 (9238):1307-1312.
114. Pessoa-Silva CL, Posfay-Barbe K, Pfister R, et al.. Attitudes and Perceptions Toward Hand Hygiene Among Healthcare Workers Caring for Critically Ill Neonates. *Infection Control and Hospital Epidemiology* 2005;26 (3):305-311.
115. Ubbink DT, Greuter HH. *Handen wassen, maar niet in onschuld*. *Nederlands Tijdschrift voor Evidence Based Practice* 2011;2:17-19.



# 2

## Learning and Quality Improvement Methodology



## 2.1 Learning and Quality Improvement

The previous chapter explained the meaning of continuous quality improvement and elaborated on influential actors and instruments involved in steering the agenda of quality improvement in Dutch hospitals. Hospitals must cope with surmounting economic austerity in combination with the increasing and sometimes divergent demands of patients, health insurance companies, professional bodies and governmental actors (e.g. Healthcare Inspectorate, Dutch Healthcare Authority). Therefore, healthcare organizations have to continuously improve the performance of their daily operations. Shojana and Grimshaw <sup>[1]</sup> ask why it is taking so long to 'crack the code' of effective sustainable quality improvement work. They call for more in-depth studies on '**how' improvement work** is done. This thesis aims to contribute to more understanding of the 'how' to improve the quality of care for healthcare professionals. This will be studied from a learning perspective.

This chapter explains the value of studying quality improvement work from a learning perspective. Continuous quality improvement is a planned and systematic process of ongoing incremental company-wide change aimed at improving hospital's performance <sup>[2]</sup>. To achieve this, (teams of) healthcare professionals need to know 'how to' assess their current practice and change their daily practices into a desired one. In addition, during the process of improvement healthcare professionals gain collective knowledge on the tasks, relations to others, and context, both in and outside the organization.

The purpose of this chapter is to build a common ground for the concepts of **individual learning, collaborative learning and organizational learning**. The literature on these topics has grown exponentially over the past 20 years and become diverse and fragmented, reasoning from different paradigms on learning <sup>[3]</sup>. Despite this rich body of knowledge, Rashman et al. concluded from a systematic review of organizational learning literature: "It is striking that there is little research on learning and knowledge transfer in the non-profit sectors" <sup>[4 p.464]</sup>. The context in the healthcare sector is quite different than in the private sector, in terms of both the internal context of an organization and the external context, with a range of stakeholders holding different goals (see § 1.3). Since context heavily influences learning processes it is worthwhile studying this in depth in the healthcare context.

The chapter proceeds with a definition of learning (§ 2.2). The next section explains various components of learning processes (§ 2.3). Thereafter, it gives an elucidation of the connection between quality improvement and learning (§ 2.4). The chapter (§ 2.5) ends with an elucidation of available knowledge on teaching quality improvement. This final section describes two commonly used learning approaches for quality improvement in healthcare: The Breakthrough methodology (§ 2.5.2) and the quality improvement collaborative (§2.5.3).

## 2.2 Defining learning

The word learning can be seen as a ‘semantic trawl’ – everyone adds something else and throws it into the towed nets of our language. This makes it impossible to give an overview of the existing literature on what learning comprises; that would fill a thesis on its own. This section aims to explain various paradigms on learning and its vital ‘ingredients’.

Knud Ileris <sup>[5]</sup> has teased out three different meanings of learning in everyday speech. First, it is the outcome of a learning process. Second, it is the mental process of an individual while learning. Third, it is the interaction between learners and their environment, both changing the other. With these three meanings, he illuminates three **different paradigms** on learning. Merriam et al. <sup>[6]</sup> added two more paradigms on the concept of learning:

- Behaviourist: learning is changing objective behaviour through stimuli (punishment and rewards) used to support development in the ‘right’ direction (response to the stimuli).
- Humanist: learning is an individual activity based on personal desires, developmental needs and motivations.
- Cognitivist: learning is mental process in which knowledge and competences are gained by processing, storing and remembering information.
- Social cognitivist: learning takes place in the social environment and in interaction with others at a specific time and context with the aim of gaining new roles and behaviour.
- Constructivist: learning is the construction of (new) meaning in a sense-making process based on experiences and previous knowledge.

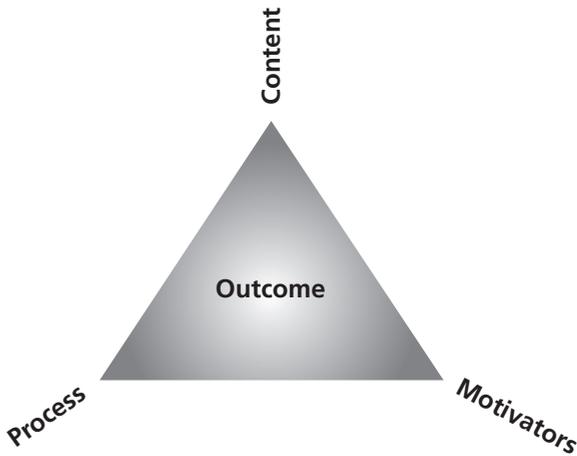
The Behaviourist paradigm focusses on learner ‘management’ and providing the learner with a predictable situation wherein stable (routine) based behaviour

is seen as preferable. In the Humanist and Cognitivist paradigms focus on the internal acquisition process(es) of learners<sup>[5]</sup> that should be optimised in a rational process of providing more accessible knowledge (cognitivist), preferably based on what the learner desires (humanist). According to Bloom<sup>[7]</sup> and Shulman<sup>[8]</sup>, these internal learning processes are ordered consecutively, from remembering, understanding, applying, analysing, evaluating, to creating.

Weggeman<sup>[9]</sup> studied the learning of professionals and states that learning is an educational process of transferring knowledge and increasing or extending the skills/competences to perform a specific task. Weggeman's<sup>[9]</sup> definition regards learning as an educational process wherein **knowledge is transferred**. Other authors in this paradigm also include the modification of existing knowledge, growth in capability, increased understanding, shift in attitude, change of behaviours, improvement in skills and even gaining other values or preferences<sup>[10]</sup>. These authors<sup>[10]</sup> have a broader definition of learning, including the whole personal development of individuals. In the Social cognitivist paradigm, the interaction between the learner and the specific situation – i.e., the social, cultural, and material context – is essential. This paradigm not only focusses on the individual learner, but also on groups of individuals who learn in collaboration. Here organizational learning is seen as the gained knowledge and skills of groups of individuals. In the Social cognitivist paradigm the learner can also be the problem solver, who thinks and act in a process of learning and improving.

Kim follows the constructivist paradigm and describes learning as “the acquisition of skill or know-how which implies the physical ability to produce some action and the acquisition of know-why which implies an ability to articulate a conceptual understanding of an experience”<sup>[11 p. 45]</sup>. His definition stresses the importance of the translation of knowledge into altered behaviour. He emphasises actual **'action'** as a measure of what is learned (the outcome of learning processes). Kim<sup>[11]</sup> also stipulates that learning is a process in which knowledge can be gained through experiences and not only in formal training or teaching situations. This replenishment is especially important since research shows that learning processes in formal training situations give poor results; very little of what is learned is transferred to the daily work situation<sup>[12]</sup>. Implicit in most definitions is the assumption that knowledge in a learning process is transferred as an independent entity and not something that can be transformed and acquired in social processes with others.

In this thesis I follow a broad definition of learning, including all above-mentioned paradigms of learning, but focussing especially on the latter two. All learning processes lead to a change of knowledge, skills, attitudes, opinions,



**Figure 2.1** Learning triangle

and competences, and comprise the content of learning (**what**), the process of learning (**how**) and our motivators for learning (**why**) (see Figure 2.1). Learning can take place individually, in collaboration with others, and on the organizational level.

The learning content in this thesis is quality improvement activities. Motivators for learning are the personal desires, interests, and needs of healthcare professionals. These motivators can also be influenced by outside pressures and the demands of others (see § 1.3). The learning outcome is an increased understanding (knowledge, insights and perspectives) and ability (attitude, competences, skills) to improve the quality of care. The next section clarifies diverse elements of the learning process.

Next to individual learning is **collective learning in groups and organizations**. From the perspective of individual learning theories, individuals learn in groups and thereby influence their organization<sup>[13]</sup>. These authors reject collective learning, asserting that groups and organizations are collections of individuals and only learn via the individual members. These authors neglect the relationship between the individual and the group or organization. They believe that organizations can learn independently of any specific individual.

From a social cognitivist paradigm, organizational learning is a process shared by connected individuals who have a common thought and action in an organizational context. Social interaction in a specific organizational context can be the source of **collective knowledge** that stimulates organizational change<sup>[4]</sup>.

Bate and Robert <sup>[15]</sup> describe this as a context where individuals learn through collaborative action to make sense of their work experiences. Kim, reasoning from a constructivist paradigm, adds, "The heart of organizational learning is the transfer process through which individual learning becomes embedded in an organization's memory and structure" <sup>[11 p. 41]</sup>.

Newell et al. <sup>[16]</sup> adds that organizations can also learn together in a network. They <sup>[16]</sup> define this as sharing and transferring existing knowledge between the members of a network and the creation of new knowledge by the cross-fertilisation of ideas from the network partners.

All these authors <sup>[14-16]</sup> perceive **formal and informal social interaction processes** between employees as the driver of individual learning. When these interaction processes are embedded in an organization, a shared meaning and perspectives (assumed the basis of knowledge) can change organizational practices, norms and structures.

## 2.3 Components of learning processes

This thesis applies a broad definition of learning in which learning processes encompass **cognition** (believing, perspectives), **mental processes** (thinking, feeling), **behaviour** (activities and affection) and **interaction processes** (with others and the context). Learning can be focussed on the process of a single individual, groups of individuals (e.g. teams), and organizations or even networks of organizations <sup>[17,18]</sup>. The purpose of this section is to investigate several components of learning processes. The emphasis is not on providing a complete overview of the available literature, but on conceptual clarity by elucidation of concepts and elements that the thesis uses.

Learning processes can be both **conscious/purposeful** and **unconscious/unfocussed** <sup>[19]</sup>. Conscious learning is mostly organized by teachers or faculty in classrooms, courses, trainings, workshops, lectures, and reading textbooks. Unconscious learning is usually a side effect of experiences, experimentation, conversations, reading novels and biographies.

The same distinction can be made for knowledge. Everybody has ready-to-share explicit knowledge that can be used to educate others. In addition, implicit or tacit knowledge can be shared by our very being, or our opinions. Tacit knowledge can only be transferred in interaction with others, for instance through observing

**Table 2.1** Tacit and explicit versus individual and collective learning

	Individual learning	Collective learning
Explicit	<ul style="list-style-type: none"> <li>• Expertise and abilities of a person.</li> <li>• Learning during the planned development of a skill.</li> <li>• Embodied knowledge acquired through some type of formal education.</li> </ul>	<ul style="list-style-type: none"> <li>• Written or unwritten rules: ‘the way things work around here’.</li> <li>• Learning based on easy ways of sharing knowledge, beliefs, values.</li> <li>• Encoded knowledge acquired by documentation and formalisation.</li> </ul>
Tacit	<ul style="list-style-type: none"> <li>• Within person knowledge and skills hard to share.</li> <li>• Intuitive learning from experiences and combining new insights with previous knowledge.</li> <li>• Embodied knowledge acquired gradually.</li> </ul>	<ul style="list-style-type: none"> <li>• Social practice between people difficult to articulate.</li> <li>• Learning during problem solving, reflection, sense-making.</li> <li>• Embedded knowledge as the second nature of the group (routines) transferred through socialisation processes.</li> </ul>

others or sharing experiences <sup>[20]</sup>. Tsoukas and Vladimirou <sup>[21]</sup> add that **tacit and explicit knowledge** are two sides of the same coin, they cannot be separated.

Combining both classifications provides a scheme with four quadrants: tacit-individual (intuitiveness), tacit-collective (social practice), explicit-individual (expertise) and explicit-collective (rules) <sup>[22, 23]</sup> (see table 2.1).

Nonaka and Takeuchi <sup>[22,23]</sup> describe a spiralling process of knowledge creation in groups, based on the combination of tacit and explicit knowledge (see Figure 2.2). Their model posits four basic phases in knowledge creation: socialisation (individual tacit knowledge is unconsciously shared), externalisation (tacit knowledge is consciously shared with others), combination (explicit knowledge is consciously shared with others), and internalisation (explicit knowledge becomes individual tacit knowledge). A problem with Nonaka and Takeuchi’s knowledge creation spiral is the assumption that learning is free of problems and conflicts. They <sup>[22,23]</sup> assume that as long as different learning contexts are present knowledge creation occurs. These learning contexts are described as shared spaces (called Ba in their writings) that act as the base for different forms of learning processes. The Ba can be both a physical and virtual environment. Nonaka <sup>[24]</sup> feels that the knowledge creation process goes beyond organizational learning, because it includes the development of organizations mental models. Knowledge in this view is seen as a resource or asset instead of the process of organizational learning from a constructivist paradigm.

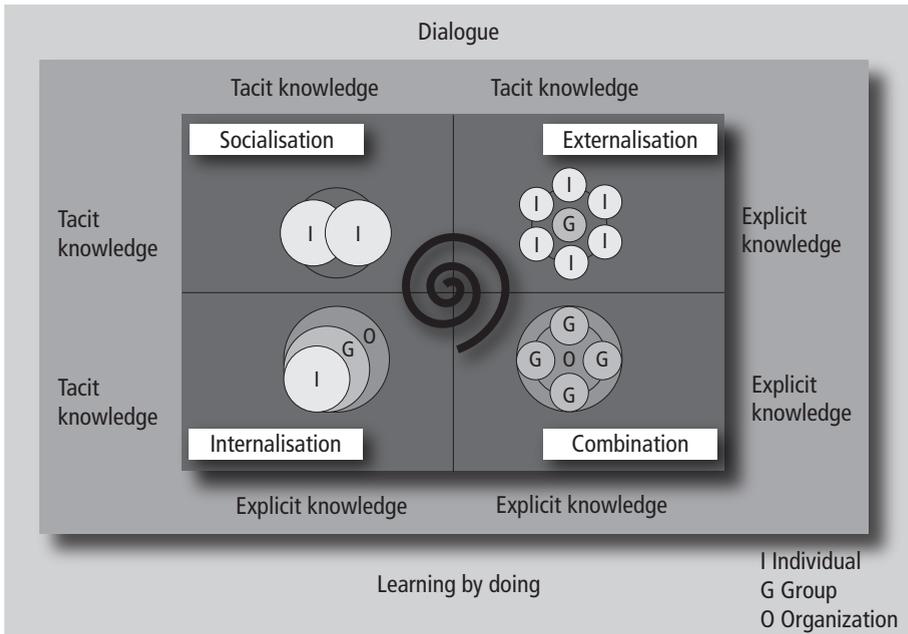


Figure 2.2 The knowledge creation spiral <sup>[45]</sup>

Most research in healthcare is focussed on **explicit learning processes** to educate healthcare professionals to perform quality improvement work (see § 1.5.1), because tacit learning processes are hard to study since they are by nature hidden. The effect of gaining tacit knowledge and knowledge creation in the educational approaches to teach healthcare professionals have not been studied yet <sup>[24]</sup>. In addition, the **sharing of tacit knowledge** between healthcare professionals during improvement work is hardly been studied <sup>[24,25]</sup>. Both are relevant topics, because if we gain more knowledge on how healthcare professionals share (implicit) knowledge, we can influence learning processes in hospitals. The objective of this thesis is to contribute to the scientific knowledge about formal education and informal learning processes that stimulate tacit and explicit knowledge translation between healthcare professionals aiming to have an impact on the ability to take effective action to change their organization.

### 2.3.1 Learning Styles and Learning Processes

To understand knowledge transfer and knowledge creation processes, we need more insight into learning styles of obtaining knowledge, skills and competences. People **learn in different ways**, termed in the literature as learning styles.

These are “cognitive, affective, and physiological traits that are relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” [26]. The International Learning Styles Network [27] describes the research on learning styles as “aimed to integrate different learning processes, some of which are thought to be relatively stable (mental learning models and learning orientations) and some of which are contextually determined (choice between regulatory and processing strategies).” [26 p. 18].

Different learning style models are used, all focussing on different aspects and methods to learn and educate. A systematic critical review [30-32] assessed **learning style models**. Seventy-one learning styles models originate from various theoretical backgrounds: psychology, sociology, business studies, education, management and policy research traditions. The reviewers divided the learning style models into five ‘families’, each emphasising a different paradigm on learning styles:

- Models that reflect a perception that learning styles are largely constitutionally-based including the visual, auditory, kinaesthetic and tactile modalities.
- Models that reflect deep-seated features of the cognitive structure of individuals, including patterns of ability and needs.
- Models that reflect the perception that learning styles are one component of a relatively stable personality type and therefore use methods to assess individuals’ personalities in combination with learning.
- Models that aim to measure flexible or stable learning preferences of individuals (over time).
- Models linked to learning approaches, strategies and orientations [30 p. 9-11; 31 p. 246].

These different ‘families’ show the different opinions about learning processes.

Another way of looking at learning styles is the way learning processes work. Piaget [28] makes a distinction between **automation and assimilation** learning style. Automation means knowledge is brand new and learning requires the formation of new mental patterns in our brain. Assimilation means new knowledge is added to previous knowledge by a process of translation, combination and transformation of our mental patterns. Thus people gain new insights and become more skilled/competent and able to reproduce and apply these insights [51]. A specific form of knowledge assimilation is the transcendent learning process. **Transcendent learning** means a complete shift of our opinion, perspective, vision. Engeström [29] refers to this as an expansive learning process. Transcendent learning occurs when (parts of) opinion, perspectives are decoupled and

reframed. Reframing can occur in a current situation providing a complete new perspective on the situation. Reframing can also occur when perspectives are used in a completely different situation.

Argyris and Schön <sup>[33,34]</sup> make a distinction between single and double-loop learning processes. **Single-loop learning** is the repeated attempt to solve one problem. Individuals, groups, organizations or networks of organizations encounter a problem and take corrective action. What is seen as a problem is the mismatch between what is desired and what is obtained. Learning is focussed on detecting errors and solving problems.

**Double-loop learning** refers to a process of solving problems by understanding the underlying causes and changing the way individuals, groups, organizations and networks of organizations react to them. Argyris and Schön refer to double-loop learning as a process in which challenges underlying assumptions, which govern our perspective on 'reality'. Our underlying assumptions, thoughts and beliefs are called our mental maps.

Wang and Ahmed <sup>[35]</sup> added **triple-loop learning** as a process in which individuals or groups change their assumptions, beliefs, norms and values, the so-called 'mental' models. Our learning aim shifts to examining the assumptions that provides the 'lens' through which we observe problems. Individuals and groups tend to express what they intend to follow. Argyris and Schön <sup>[36]</sup> refer to this as **espouse theory**. Sometimes a gap exists between what we intend to do and what we actually do (called the **theory-in-use** by Argyris and Schön <sup>[36]</sup>). By examining this gap, we can modify mental models and thus achieve sustainable change.

Fiol and Lyles <sup>[37]</sup> make the same distinction as Argyris and Schön for organization level learning processes. They distinguish low level learning such as routines, which occurs through repetition of past behaviours in a stable, clear context (single loop) and high level learning, which occurs through heuristics and insights in an ambiguous context (double loop).

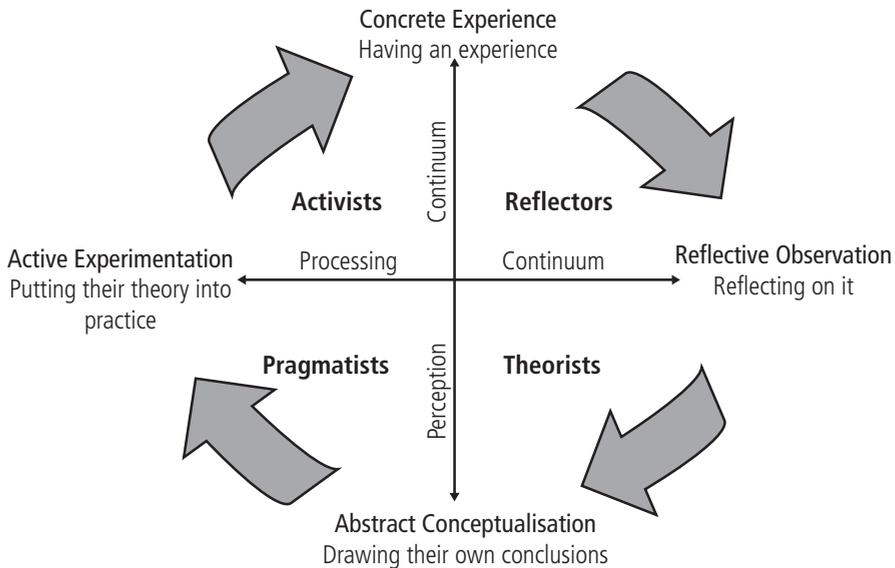
## 2.4 Connection between quality improvement and learning

The previous sections defined learning and learning processes. This section scrutinises the **cyclic processes of learning and quality improvement**. Combining the cycles of continuous quality improvement and learning processes is interesting for three reasons.

First, **the workplace** is considered an important source of learning <sup>[38,39]</sup>, particularly when one is trying to improve primary working processes. In work processes, intentional, explicit learning processes organized by external actors can provide learning opportunities, but implicit learning processes occur as well. Individuals “cycle through a process of moving from having concrete experiences, to making observations and reflections on that experience, to forming abstract concepts and generalisations based on those reflections, to testing those ideas in a new situation which leads to another concrete experience” <sup>[11 p. 48]</sup>. **Work-related learning** may result in increased knowledge, enhanced skill levels and changes of attitudes of (groups of individuals) with the intention to make improvements in their work processes and outcomes <sup>[40]</sup>.

Second, continuous quality improvement is based on the **Plan-Do-Study-Act cycle** improvement described by Deming <sup>[41]</sup>. By nature, this improvement process is focussed on reaching do-able, time-restricted small and incremental changes <sup>[42]</sup>. Senge <sup>[43]</sup> felt that the origin of Deming’s Plan-Do-Study-Act cycle <sup>[41]</sup> derives from the Dewey learning system (1916). The Dewey learning system includes the perception that learning occurs as we move between the world of thought (ideas, opinions) and the world of action (doing things). People need to be educated to use this ongoing cycle methodology to improve both as part of their daily work. Therefore, the world of thought (what can be improved in which way) and the world of action (doing experiments) must be combined. This combination is possible in Plan-Do-Study-Act. The methodology is based on learning by trial and error, as a hypothesis or suggested solution is first tested on a small scale, before the whole system is changed. By doing more, knowledge is gained and this influences the perspective of learners.

In the same line of reasoning Kolb <sup>[44]</sup> showed that learning is a **four-stage process**. He assumes that every stage requires certain learning style skills. Honey and Mumford <sup>[45]</sup> transformed Kolb’s insights into a learning cycle that fits perfectly into the quality improvement Plan-Do-Study-Act cycle (see Figure 2.3). The learning process starts with a concrete experience. Next is reflection on this



**Figure 2.3** Honey and Mumford's learning cycle (based on Kolb's cycle)

experience, sharing perceptions and checking your perceptions against others'. The third stage is conceptualisation of your experience by understanding the common ground beyond this one experience. The fourth stage combines it with previous knowledge and starts experimenting with the newly gained insights. All four stages are required to foster learning processes. For more insights into learning styles, see Chapter 5.

Honey and Mumford's learning cycles are based on the assumption that learning occurs when someone makes a mistake and then reflects upon it (learning by **trial and error**). From a more organizational change perspective, Cummings and Worley<sup>[46]</sup> describe a planned continuous change model in which continuous **incremental small changes** are seen as a change-management approach aiming to improve the organization and transform of (groups of) individuals. The Cummings and Worley model<sup>[46]</sup> contains eight stages: 1) problem identification, 2) consultation, 3) data gathering and first diagnosis, 4) feedback to key role players, 5) joint diagnosis with key role players, 6) formulation a joint action plan, 7) action, and 8) data gathering after action and starting again with potential problem identification. This change model also fits in a collaborative Plan-Do-Study-Act cycle.

From the other side, Dixon <sup>[47]</sup> explains collective learning processes in which ideas are formed, tested and reformed through experiences which influence both 'learner' and 'environment'. Dixon uses a four-phase cyclical process: 1) generating information all over the organization, 2) integration of information in the organizational context, 3) collective interpretation of information, and 4) being authorised to act based on the interpreted significance by action, evaluation and reflection. In this cyclical process, **joint reflection on experiences** leads to construction of communal shared understanding of daily practices. Swieringa and Wierdsma <sup>[48]</sup> relate learning to the cyclical process of thinking, deciding, doing, reflecting and thinking. All these authors describe stages or phases in similar cycles that include both **organizational improvements and learning processes simultaneously**.

The third reason why combining the cycles of continuous quality improvement and learning processes is of interest is because quality improvement problem solution thinking is well established in quality improvement work and fostered by the Plan-Do-Check-Act cycle <sup>[11]</sup>. The general approach is fix the problem by performing **experiments** until you find the solution and then adjust current practices. If the outcome of the experiments does not match your expectations, move on or start a new improvement cycle. The danger of this problem-solution approach is that as soon as you reach the desired outcome, alternative, perhaps better, solutions are no longer considered. The learning cycle stops and people are not encouraged to become better as expected in the continuous improvement paradigm. In addition, once problems are framed as solutions statements, there can be a tendency to exclude the consideration that perhaps the problem you observed is not the real problem. A problem can be defined as a formal statement of a **set of assumptions** about the world.

Those assumptions, however, are often not made explicit. Through conversing and making decisions at the level of tacit assumptions, people can get very good at defending their point of view at the expense of learning. This can lead to what Argyris calls 'skilled incompetence'. Rather than looking at the real data and real issues – which may prompt a re-articulation of the problem – people become very skilled at "dancing around the issues" <sup>[11 p. 27]</sup>. This single-loop learning ignores why the problem arose in the first place. Sometimes proposed solutions create other problems or even repeat the same problem in a brand new 'skin'. The problem looks different at first glance, but the **underlying pattern or cause** is the same.

One of the challenges in quality improvement is to examine why situations are seen or occur as problems. This is more the direction of double-loop learning, which aims at **understanding more of the causes and effects** and trying

to adjust processes and outcomes. More thought and attention is paid to understanding why things are done in the first place, challenging the nature and existence of prevailing conditions, procedures or concepts. Actions of individuals and processes in organizations are based on mental models. Mental models are (implicit) opinions, values, personal preferences, thoughts individuals have in their head or what is hidden in the way things are organized; how the world works. Our **mental models** help us to make sense of what we observe and constitute our ideas and memory of experiences. Mental models have a powerful influence on what we do. Argyris showed with his ladder of interference that our mental models let us see only what makes sense to our mental model. In this process a mental model creates a self-fulfilling prediction. By examining mental models, triple-loop learning occurs. Using different perspectives can create a new mental model and in turn can reframe a problem, opening up new chances for improvement.

This thesis sees learning as a process of individuals, groups of individuals, organizations and networks of organizations that lead to a change of knowledge, skills, attitudes, opinions, and competences and comprises the content of learning, the process of learning and our motivators for learning. Using this definition in the context of quality improvement work, single-, double-, and triple-loop learning processes are needed for effective improvement work and organizational learning. It requires an increase of one's capacity to make mental models explicit, thinking about new and different ways to improve and transfer new mental models into the organizational structure, processes, and improvement work routines. Therefore, a replenishment of the definition is needed: knowing how to translate new knowledge, skills, attitudes, opinions and competences into action.

## **2.5 Teaching and learning to do quality improvement work**

This section reviews the available knowledge on the process of learning to perform improvement work. In the first part the cognitive paradigm (see § 2.2) on learning and knowledge is central. It holds knowledge to be objective, solid, and systematically transferrable in predictable learning processes. Section 2.5.1 explores the formal education system, which sees teaching and studying quality improvement as gaining possession of knowledge, skills, and development of competences. Knowledge acquisition is seen as something that can be 'transmitted', 'transferred' 'accumulated', and 'achieved' by individuals and

groups. The focus in this section lies on the available scientific knowledge on the effectiveness of formal educational systems.

This thesis uses social cognitivist and constructivist paradigms on learning (see § 2.2), believing that knowledge is a personal mental construct that is shaped in interaction with others and in context. Therefore, learning can be seen as an unpredictable, personal process of interaction with others and by experience. Social processes between healthcare professionals create meaning out of experience, resulting in the development of individuals and a simultaneous increase in quality of care are studied in the literature of communities of practice in healthcare <sup>[49-51]</sup>. One community of practice is the quality improvement collaborative (see § 2.5.3) using the Breakthrough change approach (see § 2.5.2).

## 2.5.1 Teaching quality improvement methods

All sorts of courses, workshops and conferences accrued over the past 20 years provide education in quality improvement for (groups of) healthcare professionals, as individuals and teams. Research suggests that lack of knowledge and skills among healthcare professionals and managers is a barrier to quality improvement <sup>[52]</sup>. Not to be dismissed is the great deal of textbooks and journals on quality improvement in healthcare as ways to teach healthcare professionals. Textbooks and journals focus on both improvement goals and the outcome of improvement work as specific improvement and change methodology. These books and journals amplify the spread of knowledge.

Teaching healthcare professionals to help them enhance care quality is studied intensively <sup>[53,54]</sup>. There are numerous reports on the **design of quality improvement curricula** in the literature <sup>[55-58]</sup>, including articles on the importance of educating healthcare professionals in improvement work <sup>[59,60]</sup>. Discussions on the alignment of resident educational programmes with quality improvement projects are available <sup>[57,61]</sup>. Yet, only a few papers describe the 'outcome' of the educational effort <sup>[62-64]</sup>. The question 'are professionals competent enough to make quality improvements after taking these courses' is seldom addressed in science <sup>[65]</sup>. Hence, there is little scientific knowledge on the effectiveness of educational efforts to teach healthcare professionals the methods and approaches of quality improvement. In addition, not much is written about the knowledge and skills needed to achieve specific improvement goals. **Skills to improve** are seldom studied but play a vital part in the explanation of the success of improvement work <sup>[66]</sup>. Limited research has been conducted on skills as personal leadership <sup>[67]</sup> and the skill to enthuse/motivate project members <sup>[68]</sup>, but no research has

yet been done on skills needed for improvement work (see Chapter 6 for more information).

## 2.5.2 The Breakthrough Method: combination of learning and improving

For the healthcare sector, the Institute of Healthcare Improvement <sup>[69]</sup> developed the Breakthrough methodology <sup>[70,71]</sup>. The Breakthrough methodology combines improvement work and learning processes to educate healthcare professionals in improvement work. It is used in learning networks across healthcare organizations: a quality improvement collaborative (see § 2.5.3).

Breakthrough has its origins in the book *Managerial Breakthrough: the Classic Book on Improving Performance* by Joseph Juran (1964) <sup>[72]</sup>. Juran defined the Breakthrough methodology as a “**dynamic change model** suitable for chronic problems.” He describes two types of problems. The first is a **sporadic problem**, which occurs as a deviation in performance because of a specific, assignable cause. Such problems must be investigated to understand the cause of the deviation and thereafter the cause must be changed or eliminated so that the process performance returns to normal. Juran calls these control activities – identify and resolve problems – but says that these problems do not need quality improvement work; eliminating assignable causes is troubleshooting in his opinion. The second is a **chronic system problem**, which manifests as an instable process or a continually unsatisfactory performance without an assignable cause. Juran <sup>[72]</sup> reckons that quality improvement methodologies like Breakthrough are needed for such problems. His reasoning is strikingly similar to the ideas of Argyris and Schön on single- and double-loop learning (see § 2.3.1).

The Breakthrough methodology is based on system changes with Deming’s Plan-Do-Check-Act cycle <sup>[41]</sup>. This means studying the deviation, understanding what needs to be changed, hypothesising (or searching the literature) for solutions, testing, verifying and if valid, implementing the solution. Only when all four phases are followed will a sustainable breakthrough for chronic problems occur and performance will not deteriorate again.

The Breakthrough methodology is commonly used in healthcare for improvement work <sup>[69,74]</sup> and is almost synonymous with quality of care improvement based on evidence-based practice. The Breakthrough methodology is seen as a “specific model for achieving rapid, measureable and sustained improvement, with the

intention of weaving quality improvement processes into every work” [73 p.356]. In a Breakthrough project, team members work over a period of six to 18 months on a centrally set topic with well-defined goals [70]. The goals come from scientific knowledge on the topic (such as clinical guidelines) and research has showed that working on these ‘solutions’ gives positive results for improving quality of care. An essential part of the Breakthrough approach is the **extensive use of multiple, small-scale experiments**, accompanied by measures of the achievements. In these cycles, reflection on what has been learned is key. The experimental cycles provide incremental change in the direction of the desired improvement [75,76].

Learning processes in most Breakthrough projects are organized around several **educational components**. Teams are supported by clinical professionals who are experts on the improvement subject and experts in quality improvement methods [70]. In periodic face-to-face learning sessions, these experts give guidance and instruction. In their own daily practice, healthcare professionals try to apply the insights provided. With small test experiments, the team develops insight into what supports the desired change. In follow-up learning sessions, project teams report on their improvements and results, success and obstacles and interact, exchanging ideas and collectively reflecting on the lessons learned. Other learning support systems are in place too, like conference calls, site visits, online communities (list-servers), and e-learning tools with information on the improvement methods [76]. The contents of learning sessions and environments (meetings, e-learning tools, workshops) are described in over 5000 articles [77]. However, research on the impact of the learning effort is lacking. Especially research on the most effective training methods and the development of skills of participants is lacking [78,79]. This thesis strives to fill parts of this gap.

### 2.5.3 Quality Improvement Collaborative: collaborative learning processes on quality improvement

Examining learning about quality improvement from a social cognitivist paradigm is looking at learning processes during the process of making improvements. A body of literature is available on learning in **communities of practice**, comprising “groups of people informally bound together by shared expertise and passion for a joint enterprise” [80 p.139]. The distinction between a team and a community of practice is based on three aspects: 1) there must be a joint aim (what), 2) mutual engagement by frequent interactions leading to shared understanding (why), and 3) a shared change repertoire (how).

Ranmuthugala et al. systematically reviewed communities of practice in the healthcare sector and identified “much diversity in how and why communities of practice are established. They vary in composition, intended purpose, and means by which members exchange information and knowledge. (...) In common, however, was the intention of the community of practice to facilitate learning and the exchange of information or knowledge; or to improve practice. (...) Early indications from these efforts are that communities of practice, on their own or as part of larger interventions, may have a role in improving healthcare performance” [81 p. 287]. Ranmuthugala et al. [81] conclude that there is not much understanding of what determines the success of communities of practice and suggest that more research needs to be done on the ‘how and why’ of communities of practice. The **shared change repertoire** (how) and **mutual engagement** (why) are key drivers of quality improvement work. When we gain more understanding of the success of this, we can facilitate communities of practice to maximise their potential.

Research by Wenger, McDermott and Snyder [82] recognises that communities of practice go through development stages as a group, developing from coalescence to a stewardship community of practice. Some groups do not progress beyond the early stage. Although still loosely connected individuals discover common ground, these groups will never mature. To understand more about the development of communities of practice, Ranmuthugala [81] say that more research should be done on supporting the development stages of communities of practice. They suggest doing a ‘realist evaluation’ as a way to address the gap in knowledge on ‘how, why and when’ communities of practice can facilitate improvement in healthcare performance.

A specific form of a community of practice is the **Quality Improvement Collaborative**. Healthcare quality improvement collaboratives are commonly used in Europe, the United States, Canada and Australia [83]. Such a collaborative is a **temporary learning organization** set up as a network of organizations aiming to exchange knowledge about quality improvement themes and change methods. Its central aim is to implement best practices and/or the latest scientific insights (e.g. clinical guidelines) [84,85]. Øvretveit et al. consider that a quality improvement “collaborative brings together groups of practitioners from different healthcare organizations to work in a structured way to improve a specific aspect of the quality of their service. It involves them in a series of meetings to learn about best practices in the chosen area, about quality methods and change topics and to share their experiences of making changes in their own local setting” [86 p. 345]. Although commonly seen in healthcare, there is still little scientific knowledge available on the effectiveness of collaboratives [83,87-89]. Only

moderately positive results on the improvement aim of the quality improvement collaboratives are available <sup>[90-92]</sup>.

Most studies do not measure sustainable change over a longer period. The interventions used to achieve the results are heterogeneous <sup>[93]</sup> and not used to determine the success of a collaborative. Exceptions are the study by Ayers et al. <sup>[84]</sup> and the literature review by Hulscher et al. <sup>[89]</sup>. Ayers et al. <sup>[84]</sup> studied structure and process interaction characteristics of successful quality improvement collaboratives. They conclude, "The human element not only introduces unpredictability and surprise, but is also the constant source of energy that forms, develops and sustains the improvement system, exactly what is missing in today's healthcare environment and what will contribute to the re-engagement of all healthcare professionals" <sup>[84 p. 245]</sup>. Both Ayers et al. <sup>[84]</sup> and Hulscher et al. <sup>[89]</sup> conclude that the **human element and teamwork aspects** are the most important features for a successful quality improvement collaborative. Mittman <sup>[93]</sup> and Boonyasai et al. <sup>[94]</sup> add that changing clinical outcomes requires organizational learning. It is important to understand how temporary learning organizations, like quality collaboratives, support the learning process of individuals, between individuals and team members and between participating teams.

During the collaborative, healthcare professionals are educated in quality improvement by working on a specific project <sup>[86,92]</sup> using Breakthrough methodology (see § 2.5.2) as the change approach <sup>[92]</sup>. The **educational approach** of a quality improvement collaborative is to organize meetings where subject experts in clinical areas (based on the improvement aim) and application experts (focussed on the change methodology) help healthcare organizations. "They knew that breakthrough change could not happen in a traditional didactic setting; instead, organizations would commit to working over a period of six to 15 months, alternating between learning sessions, in which teams from all participating organizations would come together to learn about the chosen topic and plan changes, and 'action periods', in which the teams would return to their organizations and test those changes in clinical settings" <sup>[74 p. 17]</sup>. Despite their popularity, research shows mixed results for the effectiveness of quality improvement collaboratives as a way to educate healthcare professionals <sup>[92, 67]</sup>.

Little research has been done on **what participants learn** during a quality improvement collaborative and how this affects their improvement efforts. Only Nembhard <sup>[95]</sup>, Fremont et al. <sup>[96]</sup>, Gustafson et al. <sup>[97]</sup> and Leape et al. <sup>[98]</sup> have studied the relative helpfulness of various quality improvement collaborative features, focussing on educational methodology: e.g., change packages, collaborative extranet, site visits and learning session interactions (see Chapter

6 for more on this). In a systematic review Nadeem et al. [73] studied the connection between the educational components of quality improvement collaboratives (e.g., phone meetings, collaborative extranet, site visits, learning session and training) and achieved goals on both the provider level and patient level. They [73] conclude that it is impossible to identify quality improvement components, which support the transfer of knowledge and skills, because the reporting is imprecise. Quality improvement collaboratives not only aim to educate their participants to make changes in their own healthcare organization, but also to transform the participating teams, and through them their organizations, into **learning organizations** in which continuous improvement is part of daily business [93]. In a learning organization, participants inquire into a problematic situation on behalf of their organizations, when they experience a surprising mismatch between expected and actual results [99]. Beyond individual learning, collective learning is also supported in a learning organization. Collective learning concerns creating, acquiring and transferring knowledge and while modifying the organization by reflecting on new insights [100,101]. A quality improvement collaborative tries to accomplish this by altering the **(infra)structure** for quality improvement and the culture of the organization by conducting specified projects [102,103]. The assumption of quality improvement collaborative methodology is that healthcare organizations can be changed as a whole by project teams adopting new ideas, and become competent in using improvement techniques in their own context [83]. Not much research has been done on this transformation into a learning organization in which continuous quality improvement is part of the daily practice.

Little scientific knowledge is available on the influence of the educational approach on the development of a learning organization and how effectively they educate participants to do this. As several researchers stipulate [84], individual team members are the key to successful improvement work. Individuals need to interact like **opinion leaders** in the social network of the organization and accelerate improvement in the organization. The suggestion is that this transforms their organizations into a learning organization [58]. One can question whether the required skills and competences for professionals to act as opinion leaders and change agents – especially clinicians, as they are seen as key players – are available after participation in a quality improvement collaborative [104,105]. The driver that stimulates key stakeholders to adopt new insights is considered to demonstrate the success of most improvement project [70]. One can also question how ‘soft’ skills and competences like motivating or educating others can be transferred in a quality improvement collaborative. No research has yet been done on the participants’ gains in knowledge and skills, or to check if they are up to the task of adjusting their organization into a learning organization.

## References

1. Shojania KG, Grimshaw JM. Evidence-based quality improvement: the state of the science. *Health Affairs* 2005;24 (1):138-150.
2. Buist MD, Middleton SL. What went wrong with the quality and safety agenda? *British Medical Journal* 2013;347:f5800.
3. Lyles M, Easterby-Smith M. Organizational learning and knowledge management: agendas for future research. In: *Handbook of Organizational Learning and Knowledge Management*. Oxford: Blackwell, 2005.
4. Rashman L, Withers E, Hartley J. Organizational learning and knowledge in public service organizations: A systematic review of the literature. *International Journal of Management Reviews* 2009;11 (4):463-494.
5. Illeris K. *How we learn: Learning and non-learning in school and beyond*. Routledge, 2007.
6. Merriam S B, Caffarella RS, Baumgartner LM. *Learning in adulthood: A comprehensive guide*. San Francisco: Jossey-Bass, 2006.
7. Bloom BS. *Taxonomy of educational objectives, handbook 1: Cognitive domain*. New York: Longmans Green, 1956.
8. Shulman, LS. Making differences: A table of learning. *Change: The Magazine of Higher Learning*. 2002;34 (6):36-44.
9. Weggeman M. *Kennismanagement: Inrichting en besturing van kennisintensieve organisaties*. Schiedam: Scriptum, 1997.
10. Coffield F. *Differing visions of a learning society: research findings: Volume 1 and 2*. Bristol: The Policy Press, 2000.
11. Kim DH. *A framework and methodology for linking individual and organizational learning: Applications in TQM and product development*. Massachusetts: Massachusetts Institute of Technology, 1993.
12. Baldwin TT, Ford JK. Transfer of training: A review and directions for future research. *Personnel Psychology* 1988;41:63-105.
13. Easterby-Smith M, Lyles M (eds). *Handbook of Organizational Learning And Knowledge Management*. Oxford: Blackwell, 2005.
14. Stacey R (eds). *Experiencing Emergence in Organizations: Local Interaction and the Emergence of Global Patterns*. Abingdon: Routledge, 2005.
15. Bate P, Robert, G. Knowledge management and communities of practice in the private sector: lessons for modernizing the National Health Service in England and Wales. *Public Administration* 2002;80:643–663.
16. Newell S, Edelman L, Scarborough H, Swan J, Bresnen M. 'Best Practice' development and transfer in the NHS: the importance of process as well as product knowledge. *Health Services Management Research* 2003;16 (1):1–12.
17. Edmondson A, Moingeon B. From organizational learning to the learning organization. In: Grey C, Antonacopoulou E (eds.). *Essential Readings in Management Learning*. London, UK: Sage Publications, 2004:21-36.
18. Örtenblad, O. (2004). A typology of the idea of learning organization. In: Grey C, Antonacopoulou E (eds.). *Essential Readings in Management Learning*. London, UK: Sage Publications, 2004:53-70.

19. Von Krogh G, Ichijo K, Nonaka I. Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation. Oxford: Oxford University Press, 2000.
20. Nonaka I, Takeuchi H. The Knowledge-Creating Company. How Japanese Companies Create the Dynamics of Innovation. New York: Oxford University Press, 1995.
21. Tsoukas H, Vladimirov E. What is organizational knowledge? *Journal of Management Studies* 2001;38:973–99
22. Nonaka I, Takeuchi H. The Knowledge-Creating Company. How Japanese Companies Create the Dynamics of Innovation. New York: Oxford University Press, 1995.
23. Nonaka I, Toyama R, Konno N. SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. *Long range planning* 2000;33 (1):5-34.
24. Nonaka I. A dynamic theory of organizational knowledge creation. *Organization Science* 1994;5:14–37.
25. Raether TL. A Continuous Quality Improvement Program: Developing the Employee. In: Meisenheimer CG. *Improving quality: A guide to effective programs*. Jones & Bartlett Learning, 1997.
26. Keefe JW. Learning style: An overview. In: Keefe JW (eds). *Student learning styles: Diagnosing and prescribing programs*. In: Reston, VA: National association of Secondary School principals, 1979:1-17.
27. The International Learning Styles Network: [www.learningstyles.net](http://www.learningstyles.net)
28. Piaget J, Cook MT. *The origins of intelligence in children*. New York: International Universities Press, 1952.
29. Engeström Y, Kerosuo H. From workplace learning to inter-organizational learning and back: the contribution of activity theory. *Journal of workplace learning*. 2007;19 (6):336-342.
30. Coffield F, Moseley D, Hall E, et al.. *Learning styles and pedagogy in post-16 learning: A systematic and critical review*, 2004.
31. Coffield F, Moseley D, Hall E, et al.. *Should we be using learning styles?: What research has to say to practice*, 2004.
32. Hall E, Moseley D. Is there a role for learning styles in personalised education and training? *International Journal of Lifelong Education* 2005;24 (2):243-255.
33. Argyris C, Schön D. *Organizational learning: A theory of action perspective*. Reading MA: Addison Wesley, 1978.
34. Argyris C, Schon DA. *Theory in practice: Increasing professional effectiveness*. A Joint Publication in The Jossey-Bass Higher and Adult Education Series and the Jossey-Bass Management Series. San Francisco: Jossey-Bass publishers, 1974.
35. Wang CL, Ahmed PK. Organisational learning: a critical review. *The Learning Organization* 2003;10 (1):8-17.
36. Argyris C. Teaching smart people how to learn. *Harvard business review*. 1991;69(3).
37. Fiol C, Lyles M. Organizational learning. *Academy of Management Review* 1985;10:803–813.
38. Kessels JWM. Learning in organisations: A corporate curriculum for the knowledge economy. *Futures* 2001;33:497-506
39. Baert H, Gielen H, Lauwers B, van Bree L. *Leren van en met elkaar op de Werkplek*. Deventer, The Netherlands: Kluwer, 2007.

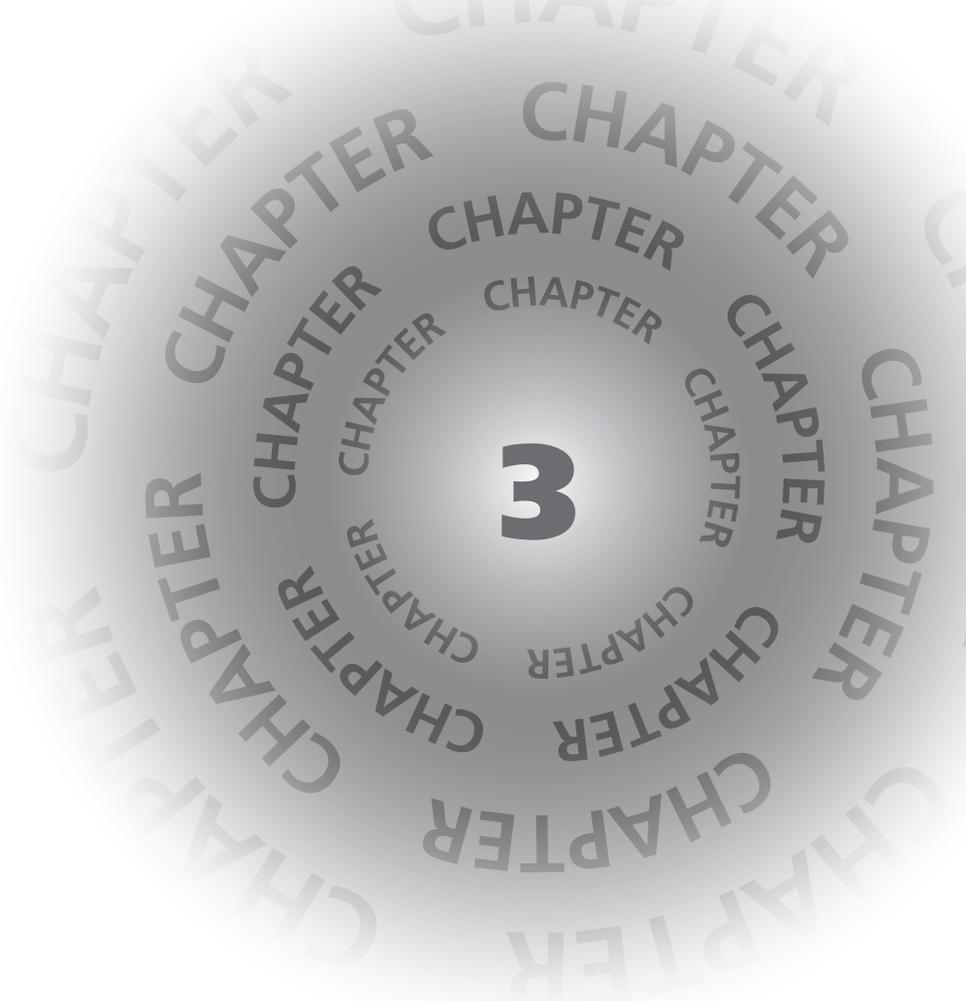
40. Simons PRJ, Ruijters MCP. Work-related learning: elaborate, expand and externalise. In: WJ Nijhof, LFM Nieuwenhuis (eds.). *The dynamics of VET and HRD systems*. Enschede, The Netherlands: Twente University Press, 2001:101-114.
41. Deming WE. *Out of the Crisis*. Massachusetts: Massachusetts Institute of Technology Center for Advanced Engineering Study, 1986.
42. Varkey P, Reller MK, Resar RK. Basics of quality improvement in healthcare. *Mayo Clinic Proceedings* 2007;82 (6):735-739.
43. Senge P. It's de learning: the real lessons of the quality movement. *The Journal for Quality and Participation* 1999;22 (6):34-40.
44. Kolb DA. *Experiential learning: Experience as the source of learning and development* (vol. 1). Englewood Cliffs, NJ: Prentice-Hall, 1984.
45. Honey P, Mumford A. *Capitalizing on your learning style*. King of Prussia, PA: Organization Design and Development Incorporated, 1995.
46. Cummings TG, Worley CG. *Managing change: Organizational development and change*, Cincinnati: South-Western College Publishing, 1997.
47. Dixon N. *The organizational learning cycle: How we can learn collectively*. Aldershot UK: Gower, 1999.
48. Swieringa J, Wierdsma A. *Becoming a learning organization: Beyond the learning curve*. Wokingham: Addison-Wesley, 1992.
49. Parboosingh JT. Physician communities of practice: where learning and practice are inseparable. *Journal of Continuing Education in the Health Professions* 2002;22 (4):230-236.
50. Amin A, Roberts J. Knowing in action: Beyond communities of practice. *Research policy* 2008;37 (2):353-369.
51. Ranmuthugala G, Cunningham FC, Plumb JJ, et al.. A realist evaluation of the role of communities of practice in changing healthcare practice. *Implementation Science* 2001;6 (49).
52. Audet AMJ, Doty MM, Shamasdin J, Schoenbaum SC. Measure, learn, and improve: physicians' involvement in quality improvement. *Health Affairs* 2005;24 (3):843-853.
53. Wong BM, Etchells EE, Kuper A, et al.. Teaching quality improvement and patient safety to trainees: a systematic review. *Academic Medicine* 2010;85 (9):1425-1439.
54. Bernabeo E, Hood S, Lobst W, et al.. Optimizing the implementation of practice improvement modules in training: Lessons from educators. *Journal of graduate medical education* 2013;5 (1):74-80.
55. Roberts, KT, Robinson KM, Stewart C, Smith F. An integrated mental health clinical rotation. *Journal of nursing education*. 2009;48 (8):454-459.
56. Kim CS, Lukela MP, Parekh VI, et al.. Teaching internal medicine residents quality improvement and patient safety: a lean thinking approach. *American Journal of Medical Quality* 2010;25 (3):211-217.
57. Moses J, Shore P, Mann KJ. Quality improvement curricula in pediatric residency education: obstacles and opportunities. *Academic pediatrics* 2011;11 (6):446-450.
58. Gupta M, Ringer S, Tess A, et al.. Developing a quality and safety curriculum for fellows: lessons learned from a neonatology fellowship program. *Academic pediatrics* 2014;14 (1):47-53.

59. Daugherty JD, Blake SC, Kohler SS, et al.. Quality improvement training: experiences of frontline staff. *International journal of healthcare quality assurance* 2013;26 (7):627-641.
60. Shojania KG, Silver I, Levinson W. Continuing medical education and quality improvement: a match made in heaven? *Annals of internal medicine* 2012;156 (4):305-308.
61. Wong BM, Levinson W, Shojania KG. Quality improvement in medical education: current state and future directions. *Medical education* 2012;46 (1):107-119.
62. Vinci LM, Oyler J, Johnson JK, Arora VM. Effect of a quality improvement curriculum on resident knowledge and skills in improvement. *Quality and Safety in Health Care* 2012;19 (4):351-354.
63. Oyler J, Vinci L, Johnson JK, Arora VM. Teaching internal medicine residents to sustain their improvement through the quality assessment and improvement curriculum. *Journal of general internal medicine* 2011;26 (2):221-225.
64. Lipstein EA, Kronman MP, Richmond C, et al.. Addressing core competencies through hospital quality improvement activities: attitudes and engagement. *Journal of graduate medical education* 2011;3 (3):315-319.
65. Alexander JA, Hearld LR. What can we learn from quality improvement research? A critical review of research methods. *Medical Care Research and Review* 2009;66 (3):235-271.
66. Hulscher ME, Schouten LM, Grol RP, Buchan H. Determinants of success of quality improvement collaboratives: what does the literature show?. *BMJ quality & safety* 2013;22 (1):19-31.
67. Wilson T, Berwick DM, Cleary PD. What Do Collaborative Improvement Projects Do? Experience from Seven Countries. *Joint Commission Journal on Quality and Patient Safety* 2003;2:85-93.
68. Marsteller JA, Shortell SM, Lin M, et al.. How do teams in quality improvement collaboratives interact?. *Joint Commission Journal on Quality and Patient Safety* 2007;33 (5):267-276.
69. <http://www.ihl.org/Pages/default.aspx> Accessed May 8, 2014.
70. Kilo CM. A framework for collaborative improvement: lessons from the Institute for Healthcare Improvement's Breakthrough Series. *Quality Management in Healthcare* 1998;6 (4):1-14.
71. Plsek PE. Collaborating across organizational boundaries to improve the quality of care. *American Journal Infection Control* 1997;25:85-95.
72. Juran JM. *Managerial breakthrough: The classic book on improving management performance* New York: McGraw-Hill, 1995.
73. Nadeem E, Olin SS, Hill LC, et al.. Understanding the components of quality improvement collaboratives: A systematic literature review. *Milbank Quarterly* 2013;91 (2):354-394.
74. Institute for Healthcare Improvement. *The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement*. IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement, 2003.
75. Langley GJ, Moen R, Nolan KM, et al.. *The improvement guide: a practical approach to enhancing organizational performance*. John Wiley & Sons, 2009.

76. Ferlie EB, Shortell SM. Improving the quality of healthcare in the United Kingdom and the United States: a framework for change. *Milbank Quarterly* 2001;79 (2):281-315.
77. The Evidence Centre. Evidence scan: Quality Improvement training for healthcare professionals. London: The Health Foundation, 2012.
78. Canal DF, Torbeck L, Djuricich AM. Practice-based learning and improvement: a curriculum in continuous quality improvement for surgery residents. *Archives of Surgery* 2007;142 (5):479-483.
79. Lindgren J. Adapting to the context and learning from earlier experience: the implementation of a national breakthrough collaborative in the context of social services in Sweden. *Quality Management in Healthcare* 2009;18 (4):231-238.
80. Wenger EC, Snyder WM. Communities of practice: The organizational frontier. *Harvard business review* 2000;78 (1):139-146.
81. Ranmuthugala G, Plumb JJ, Cunningham FC, et al.. How and why are communities of practice established in the healthcare sector? A systematic review of the literature. *BMC health services research* 2011;11 (1):273.
82. Wenger E, McDermott R, Snyder WM. *Cultivating Communities of Practice*. Boston MA: Harvard Business School Press, 2002.
83. Schouten L M, Grol RP, Hulscher ME. Factors influencing success in quality-improvement collaboratives: development and psychometric testing of an instrument. *Implementation Science* 2010;5 (1):84.
84. Ayers LR, Beyea SC, Godfrey MM, et al.. Quality improvement learning collaboratives. *Quality Management in Healthcare* 2005;14 (4):234-247.
85. Solberg LI. If you've seen one quality improvement collaborative.... *The Annals of Family Medicine* 2005; 3(3):198-199.
86. Øvretveit J, Bate P, Cleary P, Cretin S et al. Quality collaboratives: lessons from research. *Quality and safety in healthcare* 2002;11 (4):345-351.
87. Shortell SM, Bennett CL, Byck GR. Assessing the impact of continuous quality improvement on clinical practice: what it will take to accelerate progress. *Milbank quarterly* 1998;76 (4):593-624.
88. Lindgren J. Adapting to the context and learning from earlier experience: the implementation of a national breakthrough collaborative in the context of social services in Sweden. *Quality Management in Healthcare* 2009;18 (4):231-238.
89. Hulscher ME, Schouten LM, Grol RP, Buchan H. Determinants of success of quality improvement collaboratives: what does the literature show? *BMJ quality & safety* 2013;22 (1):19-31.
90. Mills PD, Weeks WB. Characteristics of successful quality improvement teams: lessons from five collaborative projects in the VHA. *Joint Commission Journal on Quality and Patient Safety*, 2004;30 (3):152-162.
91. Vos L, Dückers M, Wagner C. *Evaluatie Sneller Beter pijler 3: resultaten van een verbeterprogramma voor ziekenhuizen*. Utrecht: NIVEL, 2008.
92. Schouten LM, Hulscher ME, van Everdingen JJ, et al.. Evidence for the impact of quality improvement collaboratives: systematic review. *BMJ* 2008;336 (7659):1491-1494.
93. Mittman BS. Creating the evidence base for quality improvement collaboratives. *Annals of internal medicine* 2004;140 (11):897-901.

94. Boonyasai RT, Windish DM, Chakraborti C, et al.. Effectiveness of teaching quality improvement to clinicians: a systematic review. *JAMA* 2007;298 (9):1023-1037.
95. Nembhard IM. Learning and improving in quality improvement collaboratives: which collaborative features do participants value most?. *Health services research*. 2009;44 (2):359-378.
96. Fremont AM, Joyce G, Anaya HD, et al.. An HIV collaborative in the VHA: do advanced HIT and one-day sessions change the collaborative experience?. *Joint Commission Journal on Quality and Patient Safety* 2006;32 (6):324-336.
97. Gustafson DH, Quanbeck AR, Robinson JM, et al.. Which elements of improvement collaboratives are most effective? A cluster randomized trial. *Addiction* 2013;108 (6):1145-1157.
98. Leape LL, Rogers G, Hanna D, et al.. Developing and implementing new safe practices: voluntary adoption through statewide collaboratives. *Quality and Safety in Health Care* 2006;15 (4):289-295.
99. Argyris C. A life full of learning. *Organization Studies* 2003;24 (7):1178-1192.
100. Garvin AD. Building a learning-based theory of the firm. *Strategic Management Journal* 1993;17 (4):109-122.
101. Kotnour T. Organizational learning practices in the project management environment. *International Journal of Quality & Reliability Management* 2000;17 (4/5):393-406.
102. Bal R, Pijnenborg L. Sneller Beter pijler 3: Een tussenstand. *ZE Magazine*. 2007;1:28-33.
103. Glasgow JM, Davies ML, Kaboli PJ. Findings from a national improvement collaborative: are improvements sustained?. *BMJ quality & safety* 2012;21 (8):663-669.
104. Leatherman S. Optimizing quality collaboratives. *Quality and Safety in Health Care* 2002;11 (4):307-307.
105. Aron DC, Headrick LA. Educating physicians prepared to improve care and safety is no accident: it requires a systematic approach. *Quality and Safety in Health Care* 2002;11 (2):168-173.





# 3

## **Quality improvement guidance processes in Europe**

*Anne Marie Weggelaar-Jansen, Hester van de Bovenkamp, Julia Quartz,  
Heide Pöstges, Sara Gomes, Siri Wiig, Johan Calltorp, Naomi Fulop, Roland Bal*



### 3.1 Introduction

Improving quality and safety and reducing costs are on the agendas of health policy makers. Sustainable improvement is not easy to accomplish, because healthcare organizations are complex adaptive systems strongly influenced by the dynamics of policy, funding rules and regulations <sup>[1,2]</sup>. Much research has been carried out into different quality improvement (QI) methods at the organizational level, but there is still little understanding of the effectiveness of these methods in attaining for sustained improvement <sup>[3-6]</sup>. In the multi-level longitudinal comparative study QUASER, we attempted to create a better understanding of hospitals' QI efforts in five European countries: England, Norway, Sweden, Portugal and The Netherlands <sup>[7]</sup>. The study is connected with the European Union (EU) policy that every citizen has the right to obtain high quality healthcare anywhere in the EU. The goal of QUASER was to provide input for policies that will support EU-member states in achieving healthcare based on the principles of universality, access to good quality of care, equity and solidarity <sup>[8 p. 23]</sup>. To achieve this goal, insight is needed into how hospitals across the member states work on QI and how they can be given guidance. The guidance of hospitals is for an important part carried out by organizations with an **intermediary role** in the healthcare system. These organizations operate between policy, organizational and professional levels <sup>[9-11]</sup> and thereby influence which topics are relevant and which methods are used for QI work. This study provides policy makers aiming to improve healthcare quality at hospital level more insights into how organizations with an intermediary role influence, support and steer hospitals. Our research question was: *How do organizations with an intermediary role within the healthcare system try to influence QI work at hospital level?*

### 3.2 Organizations with an intermediary role within healthcare systems

Organizations with an intermediary role have several functions in QI guidance processes. They serve as knowledge brokers <sup>[12-14]</sup>, a 'bridge' between boundaries within the healthcare system <sup>[15]</sup>, and coordinate, support, influence, steer, legitimize, advise and/or bind together actors in social networks <sup>[16]</sup>. Typical organizations with an intermediary role in healthcare systems are regulators, professional bodies and membership societies, organizations concerned with

healthcare funding (e.g. insurance companies), patient representative groups, regional level organizations and local agencies, scientific institutions (e.g. universities and research institutes) and commercial organizations (e.g. consultancy firms). Although the importance of this intermediary role is acknowledged <sup>[17]</sup>, evidence is scarce about how these organizations try to influence hospitals in their QI efforts <sup>[4,18,19]</sup>.

The way these organizations operate is likely to be influenced by the healthcare system they operate in as is the type of organizations which play an intermediary role. Studies on QI <sup>[19-23]</sup> reveal considerable variation in the influence of policy directives and the results of national quality and safety improvement initiatives, both between and within the countries studied. However, these studies lack research into how national strategies itself and the healthcare system influence the QI effort of hospitals. Additional research <sup>[24-26]</sup> has shown that hospitals' QI efforts are heavily influenced by (inter)national health policy, regulation, professionalism, financial incentives and market focus. Nevertheless research is lacking on how these contextual factors influence the QI methods used to guide hospitals <sup>[18]</sup>. Organizations with an intermediary role use different methods to guide QI work at hospital level; **accreditation, QI guides and performance indicators** are important methods <sup>[27-29]</sup>. The WHO Health Evidence Network states that the central concept of hospitals' QI efforts should be measurement: "It provides a means to define what hospitals actually do, and to compare that with the original targets in order to identify opportunities for improvement." <sup>[30 p. 2]</sup>. Two of the principal methods of measuring hospitals' performance which WHO mentions are third-party assessment such as accreditation and the use of statistical performance indicators. Both of these QI methods are focused on the hospitals' performance (process, structure, outcome), although the approach of improvement (the change management) is also a way to influence QI work at hospital level <sup>[31]</sup>. By examining in more detail how the three QI methods (accreditation, QI guides and performance indicators) are used by organizations with an intermediary role in guiding the QI work of hospitals, a better understanding is gained of the difference between the healthcare systems studied and how guidance for QI work could be best adapted to local circumstances. Using a multilevel perspective (macro, meso, micro level) in our research allowed us to elaborate on how these three QI methods are shaped by the healthcare system in which they are implemented. These insights are important for policy makers aiming to improve healthcare quality. Our findings are also interesting for healthcare systems in transition, since it is likely that changes in these systems related to funding (general or earmarked taxation versus private insurance or out-of pocket payments), regulation (hierarchy state-led versus command and control by social actors, or negotiation by market participants) and service provision (public versus private) will also alter the way QI can be guided <sup>[32]</sup>. Based on literature <sup>[32, 33]</sup>,

we provide in Table 3.1 a brief overview of the funding, regulation and service provision in the five healthcare systems studied.

### 3.3 Methods and data

We conducted document analysis and semi-structured interviews on QI guidance processes and methods used by organizations with an intermediary role in five countries in the autumn of 2010.

#### 3.3.1 Sampling and data collection

The research began with a general **document analysis** (such as the World Health Organization Health systems in Transition reports) on QI in the countries studied. Based on the local knowledge of our research partners in their respective national healthcare systems, as well as document analysis, the most important organizations with an intermediary role in each country were selected. A broad range of organizations, such as purchasers, regulators, professional bodies, consultancy firms, knowledge centres, patient stakeholder organizations, and national and regional governmental agencies were included (see Table 3.2 for the number of organizations studied in each country). In addition, we selected in the same way leading hospital CEO's, managers and professionals in the field of QI within their country, to understand the QI guidance processes from their perspectives.

**Table 3.1** Healthcare systems of the countries studied in 2010 <sup>[32,33]</sup>

England	<p>England has a National Health Service (NHS) system, with state led dominance with regard to regulation, funding and provision of care. Regulation of hospital care is mainly carried out by state-based actors. Funding is provided from general tax revenue and co-payments for certain services. NHS services are free at the point of use for UK residents. Coverage is universal. Hospitals as NHS providers are state owned. The NHS also has contracts with some private providers. General Practitioners act as 'gatekeepers' to hospital services.</p> <p>During our research period England was undergoing a transition toward a system which theoretically would be more decentralized and increase competition between providers.</p>
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Portugal	<p>Portugal has a National Health Service system, with command-and-control healthcare steering. Regulation is carried out by the government, i.e. Health General Directorate and Regional Health Authorities, combined with strong professional-driven autonomy. Funding is from taxation with some additional insurance premiums and co-payment, with a small fee for the use of hospital care. Hospital care is publicly accessible with a smaller element of private provision (approximately 25%). Access is geographically restricted; one must attend the hospital in one's own ZIPP code.</p>
Norway	<p>Norway has a National Health Service system for its specialized care, steered across three levels: nationally (Ministry of Health and Care Services), by regional health authorities and by local health trusts. The Norwegian specialized care is funded by earmarked tax revenues. Some small extent of co-payments for consultations with specialists and GPs, for ambulatory care radiology, laboratory tests and transportation related to treatment exists.</p> <p>Patients have free choice of hospital for planned treatment. Hospitals are state owned. However, patients can also choose private providers offering treatment if the private providers have contract with the regional health authority. Patients cannot choose provider in acute situations. Main regulatory body is the Norwegian Board of Health, at the national level, who is responsible for supervising and auditing the health and social services. Much of this work is performed by the County Governor at the county level.</p>
Sweden	<p>Sweden has a decentralized National Health Service system with responsibility for provision of care resting with county councils. Regulation is state-led and based on consensus-based steering: 'soft regulation'. Funding for hospital care comes from earmarked tax revenues mainly from county council level, but also some from national level and to a small extent co-payment from patients using hospital care. A small portion of the population has additional private health insurance paid by themselves or their employer. Hospital care has universal coverage with gatekeeping by the GP – except for in emergency care.</p>
The Netherlands	<p>The Netherlands has an etatist social health insurance system in which funding and care provision is the responsibility of market actors but with their activities being heavily regulated by state. Competition and market-based steering occurs among societal, non-governmental tax funded organizations and private actors. Privately owned health insurance companies have some regulatory functions; they negotiate for high quality of care at reasonable costs. In addition the Healthcare Inspectorate has a regulatory role. Funding of hospital care is based on mandatory private health insurance of citizens. With most insurance companies individuals must pay an excess up to a certain limit. Hospital care is delivered by not-for-profit organizations and the GP is the gatekeeper for access to hospital care.</p>

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**Table 3.2** Data collection in five QUASER countries

	Studied organizations with intermediary role	Number of respondents
England	8	12
Portugal	7	17
Norway	9	19
Sweden	19	23
The Netherlands	14	18

Next, we analysed relevant documentation (including articles, annual reports, QI guides, websites, presentations, films etcetera) of the selected organizations and persons. In addition, we performed an online search in PubMed, EMBASE and Medline using the key words quality, improvement, safety, guide, guidance and the name of the organization. The purpose of this literature search was to gain knowledge of the selected organizations' role in QI.

In collaboration with the designated organizations, the QUASER researchers of each country selected '**key informants**' of these organizations as respondents. Key informants were people with inside knowledge, well informed within the context of QI guidance processes and if possible with knowledge of QI methods like accreditation, QI guides and performance indicators. The Dutch research team, sometimes accompanied by a QUASER researcher from the country being visited, conducted face-to-face **semi-structured interviews in English** (except for the interviews in the Netherlands, which were carried out in Dutch). In order to guarantee robustness and comparability we used a standardized topic-based interview guide based on the document study and the QUASER study design<sup>[7]</sup>. This ensured that the fieldwork was conducted in the different countries consistently and reliably. The topics were based on three quality dimensions<sup>[34]</sup> in relation to QI guidance processes:

- Professional quality (knowledge and skills development).
- Organizational quality (efficiency and efficacy of quality methods, improvement methods, innovation techniques, dissemination and implementation, quality control and evaluation) .
- Relational quality (interaction, relationships and political, social, legal and financial roles of individuals and organizations).

Alongside these dimensions, we also enquired about the QI methods used and the way guidance process influence hospital and professional QI efforts. National QUASER researchers performed a member check on the topic list to ensure the

validity of literature findings, and checked that terms and concepts were properly translated into national contexts and cultures. All interviews lasted between 40 and 80 minutes. We collected further **relevant (internal) documents** by asking our respondents to provide us with examples and internal documents (e.g. power point presentations, educational materials, brochures, videos, reports, articles and books) to understand how QI guidance works were included.

### 3.3.2 Data analysis

During the initial document analysis we conducted open, and for some topics structured universal axial coding (i.e. healthcare system, aim and scope of organizations with an intermediary role, definition of quality, guidance processes, auditing/certification/accreditation, performance indicators, improvement guides, QI improvement methods) <sup>[35, 36]</sup>. We tried to gain an overview of the relevant organizations and what role they play in QI guidance processes. Addition themes that emerged from this analysis were added.

All interviews were recorded, summarised (some essential parts were transcribed) and supplemented by the interviewers' field notes and analysis of the additional materials gathered during the site visit. Combining all of this information, we compiled a description of our findings for each organization. To strengthen our analysis we selected descriptions and their underlying materials at random to check how the researcher combined the information. We used these descriptions as factual information sources for further analysis for each country studied. We used open and axial coding to analyse the descriptions <sup>[36]</sup>. For each of the five countries themes emerged from the descriptions which were compared and contrasted to increase rigor and to provide richer analysis. For **each country an English written report** was written by the Dutch team. To validate these country reports, the QUASER researchers of each country and, where a lack of clarity still remained, the respondents, checked these reports.

Next, each country report was analysed independently by three Dutch researchers by **open and standardized axial coding** (i.e. role in the healthcare system, aim and scope, guidance processes, auditing/certification/accreditation, performance indicators, improvement guides, QI improvement methods, intermediary roles) of these reports <sup>[37]</sup>. The resulting comparative analysis was discussed with the other QUASER researchers and the stakeholder and expert group of the QUASER research for member checking purposes.

**Table 3.3** QI guidance systems in the five countries studied (Autumn 2010)

England	Portugal	Norway	Sweden	The Netherlands
<p>QI guidance in the healthcare system <sup>[19]</sup></p> <p>In the highly centralized English National Healthcare System (NHS) the national government (Department of Health) is responsible for the overall strategy for QI. This strategy not only focuses on QI processes but also on assessing and evaluating quality of care through a nationally mandated legislative framework and directives.</p>	<p>In the centralised Portuguese healthcare system the national government is responsible for the overall strategy on QI. The national government is organized in regional health authorities which support QI at hospital level.</p>	<p>In the Norwegian specialized healthcare system QI steering takes place at three levels – national, regional health authorities and local health trusts. Bodies at the national level determine overall policy, prepares and oversees legislation, and allocates funds. The regional health authorities play an important role in influencing QI themes for their region, using a letter of assignment for the local health trusts running the hospitals. However, hospitals enjoy a large degree of autonomy in managing issues of quality and safety locally through their internal quality committees and internal control mechanisms.</p>	<p>In the decentralized Swedish healthcare system relevant themes and methods for QI are established during bottom up and top down consultation processes. Dialogue and interaction in an educational environment are seen as important in supporting professionals. Regions and even individual hospitals have a large degree of autonomy in deciding what, how and to what extent they deal with QI.</p>	<p>The Dutch healthcare system is based on regulated competition and many actors are involved in QI work. Alongside national regulators other actors such as private health insurance companies and stakeholder organizations (professionals, hospitals and patient representative groups) all play a role in guiding QI. Although coordination at the national level has been attempted, guiding is fragmented <sup>[29]</sup> and therefore there is much external pressure on hospitals from the different actors.</p>

	England	Portugal	Norway	Sweden	The Netherlands
Organizations with an intermediary role in the healthcare system	While QI guidance is provided by the Department of Health which sets national quality standards, targets and service frameworks, some elements of decentralized regulation and guidance come from semi-independent agencies such as arm's-length bodies, regional commissioning trusts, independent organizations and professional bodies. These organizations develop, spread, assess and evaluate a diverse set of QI methods.	QI guidance is provided by the national government which is responsible for setting strategic goals, and the direction, coordination and supervision of quality of care [39]. The Portuguese health system is organized in five regional health services, which are responsible for the execution of national QI programmes. Largely because of a lack of regulatory capacity, self-regulation of hospitals is the most important QI mechanism.	QI guidance is provided mainly by governmental organizations (e.g. The Directorate of Health, the Board of Health Supervision) and some professional bodies (e.g. the Norwegian Medical Association). The governmental organization with the most important role in QI guidance is the Norwegian Knowledge Centre for Health Services (NOKC), a subordinate of the Directorate of Health. The NOKC is scientifically independent and professionally independent and their aim is to support QI.	QI guidance is provided by governmental agencies which set improvement goals and produce evidence-based knowledge on effective and efficient care (e.g. the Swedish Council on Technology Assessment in Health Care and the National Board of Health). At regional (county council) level specific QI methods and tools are developed and often there are intermediary bodies with this task in county councils and regions. Support for QI is also provided by the Swedish Association for the Local Authorities and Regions (SALAR).	QI guidance involves a hybrid governance system in which many organizations with an intermediary role exist. This results largely from fragmented QI policies. The health insurance companies and the Dutch Health Inspectorate are seen as important players in setting the QI agenda with targets and restrictions. The relative importance of the different actors is dynamic.

	England	Portugal	Norway	Sweden	The Netherlands
Accreditation	<p>Services must register annually with the Care Quality Commission (CQC), which is the independent quality inspectorate [40]. Registration is compulsory by law and only granted if national quality standards are met. Hospitals and other providers with Foundation Trust status are financially regulated by Monitor.</p>	<p>Some hospitals voluntarily use accreditation (Joint Commission <sup>[41]</sup> and Kings Fund <sup>[42]</sup>) and disease-based indicator systems for comparing quality of care within individual hospitals and between hospitals. The General Directorate of Health is currently developing a national accreditation programme, but to date this has only been piloted in a few hospitals.</p>	<p>There is no national accreditation system. Only a few hospital wards are certified according to ISO 9001 <sup>[43]</sup> by accredited certification organizations (e.g. The Norske Veritas).</p>	<p>There is no national accreditation system. A few hospitals are certified according to ISO 9000 by accredited certification organizations <sup>[43]</sup>.</p>	<p>Accreditation in the Netherlands is voluntary. Most hospitals which do opt for it are accredited by the Netherlands Institute for Accreditation in Healthcare <sup>[44]</sup> under an accreditation scheme. This scheme is based on the Baldrige Award <sup>[45]</sup> and is accredited by ISQua. Some hospitals use other accreditation systems, i.e. ISO and Institute for Dutch Quality (INK) <sup>[46]</sup>.</p>

England	Portugal	Norway	Sweden	The Netherlands
<p>QI guides</p> <p>There are numerous QI guides available on a wide range of topics (e.g. productive ward booklets<sup>[47, 48]</sup>) from governmental, semi-independent and independent bodies. QI guides play an important role in spreading knowledge on QI topics (which themes) and QI methods (which strategy to follow on implementation and cultural change and collaboration between professionals).</p>	<p>Governmental agencies develop national programmes designed to implement evidence-based guidelines on specific disease-based themes<sup>[49]</sup>. In a few of these national programmes, particularly on patient safety topics (e.g. hand hygiene) QI guides are available<sup>[50]</sup>. Guides are seen as supportive for QI work. The lack of QI guides and knowledge on implementation strategies is viewed as problematic by hospital managers and will be part of the national QI strategy in the next few years.</p>	<p>QI guides are mostly developed and/or provided by the NOKC and to some degree by professional bodies. Guides come in diverse forms, such as “how-to” guides, tools and handbooks available on paper and in digital form. They are distributed online, at (breakthrough) conferences and by local professionals. Professionals emphasise their own responsibility in developing QI strategies in the local context. Sometimes these strategies are passed on to other organizations in the form of guides. A national patient safety campaign was launched accompanied by QI guides, such as WHO safe surgery checklist.</p>	<p>QI guides are seen as a tool in the QI process; the process of producing the QI guide, rather than the guide itself, is seen as most important. QI guides are created in different QI guidance processes and are sometimes the result of consensus-based dialogue between national and regional organizations and also at hospital level between management and professionals. QI guides on the same QI topic can therefore vary between locations. National campaigns for patient safety and equal access exist, sometimes supported by online QI directives and QI guides as part of the educational materials.</p>	<p>There are QI guides in the Dutch system but since they form part of a business-oriented model, they are not readily shared. Consultancy firms and national knowledge centres develop and distribute guides. For each guide and guidance mechanism the authorisation, assessment and evaluation process is very important, and forms part of a negotiation between representatives of professionals, hospital management, insurance companies and patients.</p>

	England	Portugal	Norway	Sweden	The Netherlands
Performance Indicators	<p>The government assesses via CQC hospitals on a large number of performance indicators against national standards. Nationally set standards play a vital role in setting the agenda for QI. Performance indicators include quality as well as economic measures. These data are publicly available.</p>	<p>Few national indicators for specific topics are available. Portugal's healthcare system has seen many reforms over the last thirty years, resulting in mergers and reallocation of hospital care. Therefore drawing comparisons over the years is problematic<sup>[51]</sup>.</p>	<p>National quality indicators are available and the number of indicators is increasing. National indicators are published by the Directorate of Health. There are indicators for both primary and specialized healthcare services. National registries are available.</p>	<p>In the Swedish system there is an emphasis on transparency using indicators, with the purpose of improving quality of care<sup>[52]</sup>. This is done primarily through a wide range of disease-based national quality registries run by the professional bodies and financially supported by SALAR and the National Department of Health. The results of these indicator systems are shared with the public in what is known as the Open Comparison and constitute an important basis for benchmarking, national comparison and quality improvement.</p>	<p>The main guidance mechanism in the Dutch healthcare system is transparency for quality and safety. Therefore a large number of indicators from different stakeholders are mandatory and aim at a range of different goals: health insurance companies (purchase good quality of care), the Dutch Healthcare Inspectorate (monitoring quality and minimum amount of operations performed), professional bodies and organizations with an intermediary role (e.g. ZIZO) play an increasing role in monitoring quality of care using indicator systems.</p>

	England	Portugal	Norway	Sweden	The Netherlands
Other important guiding mechanisms	Other QI guidance mechanisms are clinical guidelines developed by The National Institute for Health and Clinical Excellence (NICE). Besides clinical guidelines NICE provides also guidance on the use of health technology and guidance on organizational change [52] with regards to efficiency. In addition, national thematic campaigns are run. For both these purposes, corresponding QI methodology guides are produced.	QI is seen as the responsibility of the individual professional. Guidance from outside the hospital is not common.	Guidance mechanisms are based on the tradition of maintaining quality and safety via enforced self-regulation (i.e. the Nordic Model). The Nordic Model emphasises internal control based on a three-pillar tripartite collaboration of control among employers, employees and government [53]. In addition educational support and bottom-up implementation projects are important. The NOKC provides access to scientific literature for the entire nation in the Norwegian Electronic Health Library. Here, latest evidence-based literature is available for every healthcare professional.	Other guidance mechanisms are educational programme conferences aimed at professionals, since they are seen as the most relevant players in ensuring good quality of care. Also a variety of forums addressing both quality and safety issues are used in which dialogue is encouraged, with the aim of setting the QI agenda and spreading knowledge on QI methods.	Rankings of the performance indicators and awards for good quality (e.g. pink ribbon certificate for good breast cancer care) also influence the quality agenda at hospital level. Several national campaigns driven by a collaboration of professional bodies also exist. The QI effort of hospitals is supported by consultancy firms and research and knowledge centres.

## 3.4 Findings

First, we present our findings on QI guidance by organizations with an intermediary role within the healthcare systems in the five countries studied <sup>[38]</sup>. This includes outlining the similarities and differences in their QI work and detailing the key organizations with an intermediary role involved in QI work. Table 3.3 provides an overview of these findings. Second, we elaborate on how the three QI methods – accreditation, QI guides and performance indicators – are used in supporting and influencing hospitals in their QI work.

Our analysis shows that QI guidance processes are delivered by a diverse set of organizations in the various healthcare systems. At first glance there seems to be considerable commonality between the five countries regarding QI guidance and methods used to support and influence QI work at hospital level. However, on closer examination of the different QI methods we noticed important differences in 1) which organizations with an intermediary role have which function within the healthcare system 2) the QI approach of these organizations and 3) how they assume QI work at hospital level can be guided. These differences reflect, among other things, the healthcare systems in which they are used.

### 3.4.1 Accreditation

Accreditation is a type of QI guidance whereby pre-determined organizational and clinical standards are set in a combination of self assessment and external surveys to encourage professionals to change <sup>[54,55]</sup>. In some countries accreditation findings are used to shape national policy <sup>[56]</sup>. As Greenfield noted: “Accreditation programmes are complex organizational interventions, trying to shape both organizational and clinical conduct within a multifaceted context in turn shaped by, for example, the healthcare and policy environment.” <sup>[57 p. 330]</sup> Evidence on the beneficial effects of accreditation programmes produces a varied picture <sup>[55,58]</sup>. As elaborated before (see table 3.2) there are differences between voluntary and involuntary accreditation in the countries studied. The way accreditation is organised within the countries studied and therefore the support and steering of QI work differs in five ways. First, the **accreditation agencies’ role** varies in relation to the development, application and evaluation of standards <sup>[57]</sup>. In some countries the accreditation agency is an independent not-for-profit organization which autonomously sets standards (the Netherlands). In other countries the government heavily influences standards and funds the accreditation agency (England). In some countries

industry standards such as ISO (several hospitals in Sweden and a few hospital wards in Norway) or healthcare standards such as Joint Commission International or Kings Fund (Portugal) are used by independent commercial organizations. Second, **the actors in charge** of the on-site assessment differ. In the Netherlands multidisciplinary teams of healthcare peers are used; in other countries professional assessors with greater or lesser degrees of clinical knowledge (England, Portugal, Sweden, and Norway) perform the on-site assessment. Third, the **accreditation standards** differ. Some countries have standards focussing on the existence of on-going improvement work cycle as a quality management system (the Netherlands, Sweden and Norway). Some standards also include norms regarding specific care processes (England, Portugal) combined with patient focused service quality (the Netherlands) or ensuring patient rights (Norway, Sweden). Some standards focus on clinical outcomes (England) and/or culture for QI and patient safety (the Netherlands and Sweden). A few standards focus on compliance with national programmes or evidence-based guidelines (England, the Netherlands). Fourth, the **input for the assessments** differs. Accreditation can draw on actual performance data (England, Portugal) but also on self-evaluation reports (the Netherlands).

Fifth, the survey process used and reports for the organization vary. In the Netherlands the focus is on improvement; based on extensive interviews, observation and a document survey a candid assessment report with recommendations for improvement and compliments for outstanding approaches is employed. In contrast, accreditation in England is part of a monitoring process and the focus is summative rather than formative. The ISO reports in Norway and Sweden are reports which provide an overview of deviations of the hospital performance as measured against predetermined standards and make some suggestions for improvement. The reports are mainly based on the assessment of documentation of (quality) management systems and are used as an evaluation tool for this.

### 3.4.2 QI guides

QI guides to transfer information about QI methodology are used, especially in thematic QI programmes <sup>[59]</sup>. We defined a QI guide as an observable product (e.g. a document or website) that offers guidance for QI work by leading, directing or advising hospital management and/or professionals on change concepts and action steps. Evidence is scarce as to which QI guides are used to support QI work and how they are used <sup>[60]</sup> to guide hospitals. By studying QI guides for directing QI work on patient safety, clinical effectiveness and patient experience from the five countries, we observed four key areas where differences exist.

First, the ways in which **guides are produced** differs among the five countries. In England, the main producers of guides are national organizations, mostly linked to or part of the National Health Service. In Norway all kinds of QI guides and tools are published by the Norwegian Knowledge Centre for Health Services (NOKC). These QI guides are mainly based on summaries of research in order to promote the use of research results by professionals. QI guides are tested by professionals before they are spread. Guides in Sweden are mainly produced in a bottom-up fashion by involving credible key stakeholders in the development and spread of guides, and the process of creating the guide is seen as almost more important as using them. In Sweden, guides are tested and evaluated with end-users (in one example patients were part of the team). In the Netherlands guides are produced either by non-governmental organizations with a specific mission (e.g. running the national safety management programme) or by private consultancy companies which use them to sell their expertise in a 'quality market'. The only QI guide retrieved in Portugal was a translation of the EU guide for hand hygiene.

Second, the **focus on guides as a QI method** differs. In England, QI guides are the main instrument used by organizations with an intermediary role to support and influence QI work. England uses QI guides extensively and these might or might not be embedded in targeted programme. In the other countries the role of QI guides is far less dominant. In Sweden and Norway collaboratives and educational projects, rather than guides, are deemed important for QI guidance. However, within these collaboratives and projects guides might play a role in disseminating knowledge. In Portugal, people (especially clinicians) and organizations are seen as most relevant for QI work, although the lack of QI guides is seen as a problem. Portuguese hospitals turn to international organizations like WHO to obtain QI guides. In the Netherlands guides from the national safety programmes are available and used to support and steer QI work for ten improvement aims. A diverse set of other QI guides are available, but are mostly privately owned, for sale and part of a quality consultation market.

Third, guides come in **different forms** such as written guides (e.g. booklets, handbooks, manuals, instruction papers, catalogues) and audio-visual guides (e.g. films, audio recordings, power point slides). A clear trend toward the use of electronic media is visible in all countries. This includes social media and (public or restricted) websites, sometimes with interactive (learning) tools (e.g. wiki's, FAQ), and databases with examples of best practice. Most countries use a combination of different methods to spread guides. In Sweden, Norway and the Netherlands we also observed a trend toward creating several versions of the same guide depending on the target reader, so that the language and examples used are appropriate for them.

Fourth, we also noticed differences in the **content of the guides**. Some guides

attempt to use simple, language accessible to all healthcare workers, with minimal jargon and academic terminology (e.g. the productive ward booklets from England and the Netherlands). Some utilize a visually attractive design format enabling users to make a quick reference using pictures or summaries in boxes or step-by-step manuals (e.g. the Patient Safety Campaign in the Netherlands). Other guides engage readers by using empathy-driven narrative examples with the aim of tapping into the readers' emotions (e.g. QI guide for reducing access time in Sweden).

Respondents from all five countries stated that different actors in the hospitals can use guides in their efforts to spread change concepts and action steps for specific themes. In this way guides provide QI guidance at hospital level to many different professionals.

### 3.4.3 Performance Indicators

Performance indicators and reporting systems have grown substantially as the more visible aspects of the hospitals' QI efforts <sup>[61]</sup>. The increasing emphasis on objective measures of personal and organizational results promotes the use of comparative data and benchmarking <sup>[28]</sup> in all five QUASER countries. Indicators not only play a role in steering and influencing the QI efforts of hospitals, but their outcome also influences other actors in the system. As Gibbert et al. concluded: "Indicators that measure healthcare processes should be reported by quantifying the potential gains, thus encouraging action. Estimating the gains across many indicators allows priorities to be established, such as identifying the areas with the greatest potential for improvement." <sup>[62 p.137]</sup> Nevertheless, no solid evidence is available for the claim that indicators improve the quality of care <sup>[63,25]</sup> and evidence is lacking on the influence of measurement and reporting systems in guidance processes <sup>[61]</sup>. The importance of indicators in guiding processes seems huge and over the past decade the quantity of indicators used has increased <sup>[61]</sup>. However, our study shows that the specific role played by indicators in steering and influencing hospital QI work differs in four ways among the five countries studied. First, the way **indicators are produced** varies. In the more centrally-governed healthcare systems (England, Portugal) indicators are determined by the national government (Ministry of Health in England) or governmental organizations (Direcção-Geral da Saúde in Portugal). In the more consensus-based healthcare systems like Sweden indicators are developed in an iterative process between healthcare managers, patient representative groups, unions, researchers, regional representatives and governmental bodies. In Sweden hospital care quality is monitored from two different levels: by regional comparisons (e.g. Open Comparison Report in Sweden) and via more than 70 national regis-

tries on disease occurrence, diagnosis, treatment and outcomes. The latter are run by independent organizations connected to professional bodies and funded by the national government and the Swedish Association of Local Authorities and Regions (SALAR). In addition there is a national Patient Register. In Norway the Directorate of Health is responsible for the development of national quality indicators and data is collected by the Norwegian Institute of Public Health and Norwegian Patient Register. In the Dutch market-based system every actor devises his own indicators; hospitals face diverging indicators and sometimes aberrant measures from the Healthcare Inspectorate, health insurance companies, patient organizations and professional societies. Second, the **reliability and accuracy of indicators** is viewed differently. In Sweden, Portugal, England and Norway the indicators are extracted from hospitals' administrative systems and accountability systems are used to verify the data. In the Netherlands, hospitals report their own outcome on indicators and validity of data is only superficially checked. Third, **availability of the data** to different actors varies among the countries. In all countries, except Portugal, elements of the data are available to the public. For example, in Sweden the regional level Open Comparison Report (a benchmark between county councils) is published on an annual basis. In England, the Care Quality Commission (CQC) and NHS Choices make a wide range of information concerning quality of care publicly available (see [www.nhs.uk](http://www.nhs.uk)). In addition, many professional bodies, charities, patient organizations and the commercial organization Dr. Foster make quality information available to the public. In the Netherlands and Norway websites ([www.kiesbeter.nl](http://www.kiesbeter.nl) and [www.frittsykehusvalg.no](http://www.frittsykehusvalg.no) and [www.helsenorge.no](http://www.helsenorge.no)) are used to inform the public and help them to choose good quality of care. In Portugal patients have no free choice of hospital and therefore hospitals' quality information is deemed less relevant to the public. Fourth, the way **the outcome** of performance indicators **is used** differs between the countries. In England indicators play an important role in the monitoring of quality of care and hospitals can be penalised if they perform poorly. In Portugal several indicators are part of the negotiation process of the Central Administration of Health Services (ACSS) with hospitals. In Sweden and Norway the outcome of indicators is above all used to improve care, and the national registries particularly contribute to building more evidence about the long term effects of treatment. In the Netherlands indicators are used to monitor quality and are increasingly used in the purchasing process and for marketing and publicity purposes. In all five countries the outcome of indicators is used as an opportunity for healthcare planning and steering of relevant QI themes at national level.

## 3.5 Discussion

### 3.5.1 Healthcare system and QI methods used

In all countries studied improving healthcare quality is high on the agenda and there is considerable overlap in important QI topics between countries. In view of this one might easily propose designing QI guides and QI guidance processes which can be used in every country in a universal way <sup>[57,64]</sup>. However, our research shows that the way QI guidance processes are organized differs considerably between healthcare systems, which would make the effectiveness of such a one-size-fits-all strategy unlikely. Furthermore, our research shows that the **QI methods are multifaceted** in their attempt to support and influence QI work at hospital level and reflect the underlying patterns of the healthcare system. The MARQuIS study on QI in European countries <sup>[19,20]</sup> proposes a generic improvement-maturity index in seven different domains for QI work in hospitals. The researchers identified considerable variation in the maturity of hospital QI systems both within and between countries <sup>[20]</sup>. In our research we attempted to understand more about the underlying causes of this variation by studying the guidance of QI methods in different healthcare systems. We postulate that the substantial differences in QI guidance revealed between countries suggest that there is no universal idea on QI work common to all countries. Rather, QI work, the part played by organizations with an intermediary role and the instruments they use **reflect national differences in style and culture**. Based on this, we argue that a universal maturity index for QI systems might be problematic as the maturity of QI systems depends on the way the healthcare system is organized and QI guidance is provided. The healthcare systems studied have very different practices of QI guidance and multifaceted QI methods are used. Therefore our evidence challenges the current predilection to develop a one-best-way method to give guidance and by this support and influence QI work at hospital level. We suggest a shift towards greater understanding of the differences between systems and how this affects QI work. QI methods like accreditation, QI guides and performance indicators should be seen as methods which need to be adapted to the context of healthcare systems. When healthcare systems transform, most likely the way these methods support or influence QI work at hospital level will change. Since we conducted this research only in five countries, the results of our research can only be generalised with some caution. This is especially true for countries which do not have the same healthcare systems or for countries in transition. More research needs to be undertaken on the strategies used by organizations with an intermediary role in the QI guidance process, as this will contribute to a

better understanding of the effectiveness of their attempts and more insight into the supporting factors and the influence of the QI methods used.

It is also important to point out that during our field work within some countries, a major process of reform was underway, for example, the attempt to open up the market to private and not-for-profit healthcare providers in Portugal and England. How these changes will affect QI guidance processes, and in particular the use of the three QI methods studied is not yet clear.

Greenfield et al. <sup>[65]</sup> refer to the diverse ways in which accreditation is organized as panoply of strategies, mechanisms, approaches and initiatives. They advocate a standardized accreditation programme built on evidence to prevent inefficiency. Greenfield et al. <sup>[57]</sup> suggest the formation of national accreditation agencies in close collaboration with the International Society for Quality in Healthcare (ISQua). By exchanging standards and jointly working on the development and revision of standards, ISQua could assist the national agencies. However, our study plainly shows that QI guidance via accreditation differs vastly between countries. Various organizations with an intermediary role are involved in the development, application and evaluation of standards and execution of the audit. In the more centralized state-dominated healthcare system in England, accreditation serves as an instrument of control and leads to a strongly compliance-based QI approach. In the more decentralized healthcare systems like Sweden and Norway however, accreditation is seen as an instrument for supporting local QI work. In the Dutch system it is viewed more as an instrument for aiding improvement from peer to peer. Therefore, striving for harmony between the accreditation approaches can be neither feasible nor useful <sup>[32,34]</sup>. Furthermore, our research also reveals differences in the availability of QI guides, the forms in which they come, and who provides the impetus for them or is involved in their development. Nevertheless, QI guides are seen in all five countries as supportive for guidance processes. In all countries, except England, QI guides are not central to QI work; people, social support and educational structures are seen as more important. Therefore, we suggest that QI guides form part of educational material or national QI programmes, rather than being used as a solitary product. More research is needed on the development and use of QI guides as tools for spreading knowledge about improvement topics and change methodology from the users' perspective (professionals and management). We also question the feasibility of further standardizing performance indicators between countries as a method for QI <sup>[67]</sup>. Our research identifies great differences across national healthcare systems in who provide the impetus for indicators, how the reliability and accuracy of indicators is viewed and how the availability of data for different actors is used to influence hospitals. Also the ways in which results of performance measurement is used and by whom differs between countries. Before

shifting to a European wide set of performance indicators more insight is needed into how performance indicators can be used in the various healthcare systems.

### 3.5.2 Organizations with an intermediary role in the healthcare system

Organizations with an intermediary role are described as “hybrid and boundary-crossing, because by definition they bridge and interact with different disciplines, actors, interests, value systems, fields of activity and institutions.”<sup>[16 p. 243]</sup> Our research shows that these organizations can play an important role in the setting of hospitals’ QI agenda by expression of QI demands (e.g. setting accreditation standards<sup>[57,66]</sup> and/or indicators<sup>[67]</sup>) and the evaluation and monitoring of these demands. They can also influence QI work by providing guides to transfer knowledge on improvement processes and change management approaches. One role of such organizations, mentioned by Boon et al.<sup>[16]</sup>, is **synthesis between different actors and methods**. We noted that in some countries improvement themes (e.g. national programmes) are accompanied by QI guides, performance indicators and accreditation standards (e.g. Patient Safety campaign in the Netherlands<sup>[68]</sup> and Norway<sup>[69]</sup>). More research on the synthesis of different QI methods is needed, in particular in countries with many different organizations with an intermediary role involved in QI guidance of hospitals. Every organization has its own responsibilities and aims within the healthcare system. More research on the network of intermediary organizations, the relationships between them and how they collaborate is needed. By using a broad definition of organizations with an intermediary role, we included heterogeneous types of organizations within the five countries studied. Our QUASER research partners identified the most important organizations and key players and therefore selection bias cannot be ruled out. The formation of a conceptual framework, based on the different intermediary functions and QI methods used, would help to select organizations with an intermediary role in further research. Our research (especially Table 3.3) provides the initial foundation for such a conceptual framework. It should also be noted that we did not study how effective these organizations with an intermediary role are in their effort to guide QI work at hospital level. More insight into this would be beneficial.

## 3.6 Conclusion

Our research reveals a wide variation in the way organizations with an intermediary role in healthcare systems interact with and support, influence and steer hospitals in their QI efforts. We studied the differences and similarities between five countries: England, Portugal, Sweden, Norway and the Netherlands. We focussed on the application of three QI methods commonly used by organizations with an intermediary role: accreditation, performance indicators and QI guides. We conclude that these organizations play an important role by influencing themes and change methodologies relevant for QI work in hospitals and monitoring the QI demands laid down by actors such as the national government. The way QI methods are used differs considerably among the countries studied; differences were observed in the **objectives pursued**, the **actors involved** and who **provides the impetus**, the **way the methods are used** and sometimes the **appearance of visible materials** used or produced. The way the healthcare systems are organized in each country is reflected in the differences. A deeper understanding of how local QI guidance processes can be supported and influenced is needed.

## Acknowledgements

The authors wish to thank the European Commission for funding this research, and all those who supported and guided this work both within the QUASER research project team (Janet Anderson, Susan Burnett, Kathryn Charles, Susie Edwards, Lisbeth Hoeg-Jensen, Glenn Robert, Charles Vincent England; Boel Andersson, Tony Andersson, Pär Höglund, Anette Karlton and Johan Sanne Sweden; Karine Aase and Christan von Plesse Norway; Alexandra Fernandes and Francisco Nunes Portugal) and as external associates, especially Dag Tomas Sagen Johannesen from Norway for his contribution to the accreditation paragraph. In particular we would like to thank all the respondents in the five countries as well as the members of the stakeholder and expert advisory group of the QUASER project for their contribution.

## References

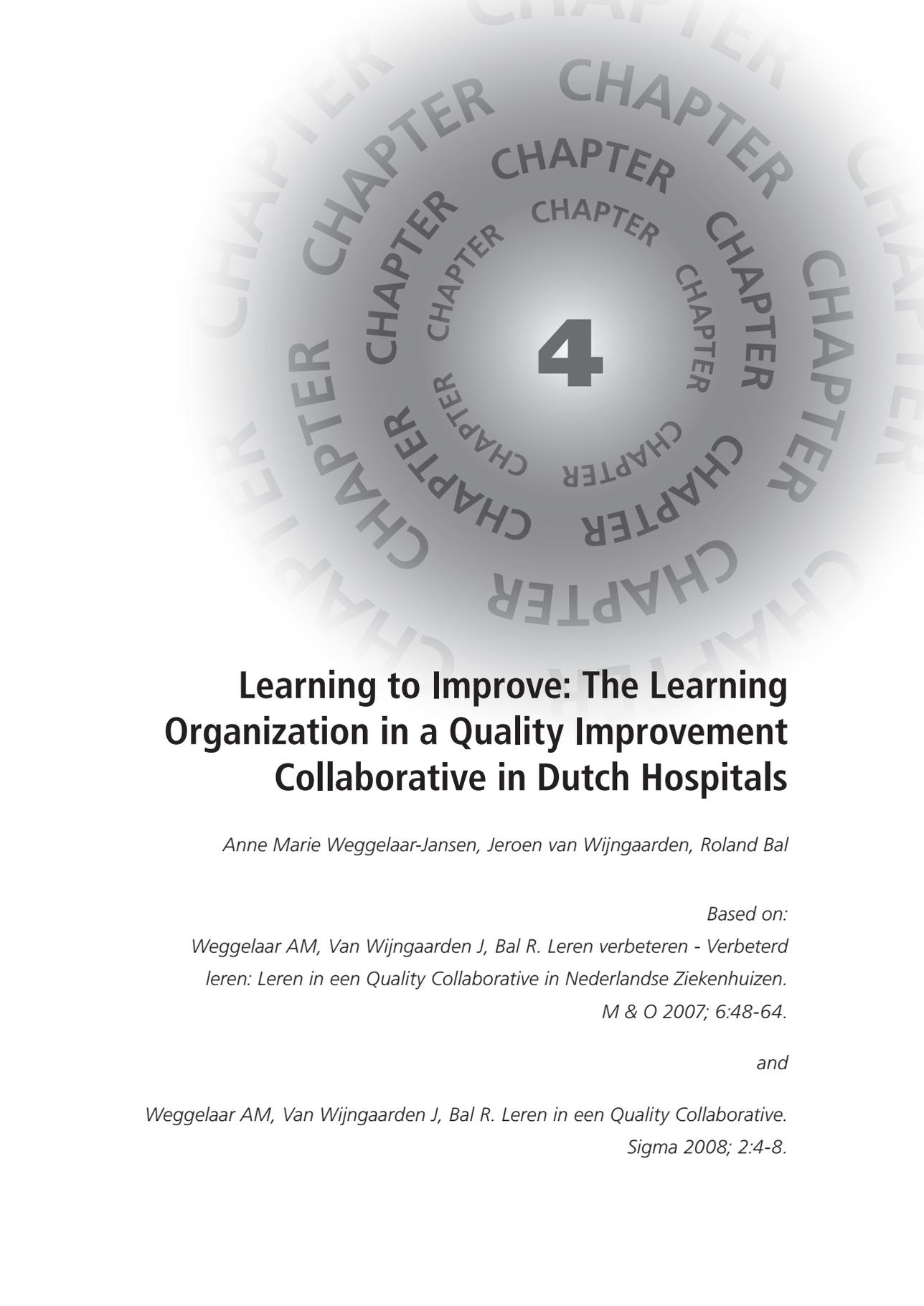
1. Institute of Medicine: Committee on Quality of Health Care. *To Err is Human: building a safer healthcare system*. Washington DC: National Academy Press, 2000.
2. Institute of Medicine. *Crossing the Quality Chasm: a new health system for the twenty-first century*. Washington DC: National Academy Press, 2001.
3. Øvretveit J, Gustafson D. Evaluation of quality improvement programs. *Quality and Safety Health Care* 2002;11:270-275.
4. Øvretveit J. *What are the best strategies for ensuring quality in hospitals?* Geneva: WHO, 2003.
5. Wiltsey Stirman S, Kimberly J, Cook N, Calloway A, et al. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for further research. *Implementation Science* 2012;7:17.
6. Wiig S, Robert G, Anderson J, et al. Applying different quality and safety models in healthcare improvement work: boundary objects and system thinking. *Reliability Engineering & System Safety*. 2014;125:134-144. DOI information: 10.1016/j.res.2014.01.008.
7. Robert G, Anderson J, Burnett S, et al. A longitudinal, multi-level comparative study of quality and safety in European hospitals: the QUASER study protocol. *BMC Health Services Research* 2011;11:285-294.
8. Commission of the European Communities, Directives of the European Parliament and the Council: on the application of patients' rights in cross-border healthcare, 2008. Accessed January 19, 2014 [http://ec.europa.eu/health/ph\\_overview/co\\_operation/healthcare/docs/COM\\_en.pdf](http://ec.europa.eu/health/ph_overview/co_operation/healthcare/docs/COM_en.pdf)
9. Howells J. Intermediation and the role of intermediaries in innovation. *Research policy* 2006;35 (5):715-728.
10. Honig MI. The new middle management: Intermediary organizations in education policy implementation. *Educational Evaluation and Policy Analysis* 2004;26:65-87.
11. Sin CH. The role of intermediaries in getting evidence into policy en practice: some useful lessons from examining consultancy-client relationships. *Evidence & Policy* 2008;4:85-103.
12. Ward VL, House AO, Hamer S. Developing a framework for transferring knowledge into action: a thematic analysis of the literature. *Journal of Health Services and Research Policy* 2009;14:156-164.
13. Ward V, House A, Hamer S. Knowledge brokering: Exploring the process of transferring knowledge into action. *BMC Health Services Research* 2009;9:12.
14. Canadian Health Services Research Foundation. *The theory and practice of knowledge brokering in Canada's health system*. Ottawa: CHSR, 2003.
15. Tetroe JM, Graham ID, Foy R, et al. Health research funding agencies' support en promotion of knowledge translation: An international study. *Milbank Quarterly* 2008;86:125-155.
16. Boon WP, Moors EH, Kuhlmann S, Smits RE. Demand articulation in emerging technologies: Intermediary user organizations as co-producers?. *Research Policy* 2011;40(2),242-252.

17. Fernandez RM, Gould RV. A dilemma of state power: Brokerage and influence in the national health policy domain. *American Journal of Sociology* 1994;1455-1491.
18. Lombarts M, Rupp I, Vallejo P, et al. Differentiating between hospitals according to the 'maturity' of quality improvement systems: a new classification scheme in a sample of European hospitals. *Quality and Safety in Health Care* 2009;18:38-43.
19. Vallejo P, Suñol R. MaRQuIS: quality improvement strategies for European cross boarder healthcare. *Quality and Safety in Health Care* 2009;18:i1-i2.
20. Suñol R, Vallejo P, Thompson A, et al. Impact of quality strategies on hospitals outputs. *Quality and Safety in Health Care* 2009;18:62-68.
21. Lombards MJMH, Rupp I, Vallejo P, et al. Application of quality improvement strategies in 389 European hospitals: results of the MARQuIS project. *Quality and Safety in Health Care* 2009;18:38-43.
22. SIMPATIE, Final Report: Safety Improvements for Patients in Europe, 2007. <http://www.esqh-office-aarhus.dk/home/projects/simpatie> Accessed January 19, 2014.
23. Spencer E, Walshe K. National quality improvement policies and strategies in European healthcare systems. *Quality and Safety in Health Care* 2009;18:22-27.
24. Tuohy CH. Agency, contract, and governance: shifting shapes of accountability in the healthcare arena. *Journal of Health Politics, Policy and Law* 2003;28:195-216.
25. West E. Organizational sources of safety and danger: Sociological contributions to the study of adverse events. *Quality in Health Care* 2000;9:120-126.
26. Hibbard JH, Stockard J, Tusler M. Hospital performance reports: impact on quality, market share, and reputation. *Health Affairs* 2005;24 (4):1150-1160.
27. Van den Heuvel J, Koning L, Bogers AJ, et al. An ISO 9001 quality management system in a hospital: bureaucracy or just benefits?. *International Journal of Health Care Quality Assurance* 2005;18 (5):361-369.
28. Shaw CD. Accreditation in European healthcare. *Joint Commission Journal on Quality and Patient Safety* 2006;32 (5):266-275.
29. Andrews M. Good government means different things in different countries. *Governance* 2010;23 (1):7-35.
30. Shaw C. How can hospital performance be measured and monitored?. World Health Organization Regional Office for Europe, 2003: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/74718/E82975.pdf](http://www.euro.who.int/__data/assets/pdf_file/0009/74718/E82975.pdf) Accessed January 19, 2014.
31. Shojania KG, McDonald KM, Wachter RM, et al. Closing the quality gap: a critical analysis of quality improvement strategies, Volume 1–Series Overview and Methodology. Technical Review 9 (Contract No. 290-02-0017 to the Stanford University–UCSF Evidence-based Practice Center). Rockville, MD: Agency for Healthcare Research and Quality, 2004. AHRQ Publication No. 04-0051-1.
32. Böhm K, Schmid A, Götze R, Landwehr C, Rothgang H. Five types of OECD healthcare systems: Empirical results of a deductive classification. *Health Policy* 2013;113 (3):258-269.
33. Reibling N. Healthcare systems in Europe: towards an incorporation of patient access. *Journal of European Social Policy* 2010: 20(1): 5-18.
34. Parasuraman A, Zeithaml VA, Berry LL. A conceptual model for service Quality and its implications for future research. *Journal of Marketing* 1985;49:41-50.
35. Creswell JW. *Qualitative inquiry and research design: Choosing among five approaches*. 2nd ed. Thousand Oaks CA: Sage, 2007.

36. Kluge, S. Empirically Grounded Construction of Types and Typologies in Qualitative Social Research. *Forum: Qualitative Social Research* 2000;1 (1):14: <http://nbn-resolving.de/urn:nbn:de:0114-fqs0001145> Accessed January 19, 2014.
37. Walsh D, Downe S. Meta-synthesis method for qualitative research: a literature review. *Journal of Advanced Nursing* 2005;50:204-211.
38. Van de Bovenkamp H, Quartz J, Weggelaar-Jansen AM, Bal R. Guiding quality work in European hospitals. London: UCL, 2011.
39. Barros PP, Almeida SJ. Healthcare systems in transition: Portugal. European Observatory on Health Care Systems, 2007.
40. UK Care Quality Commission Licensing and Monitoring Care Services, 2011: <http://www.cqc.org.uk/organisations-we-regulate/registering-first-time/regulated-activities> Accessed January 19, 2014.
41. Joint Commission International Accreditation & Certification Scheme, 2011: <http://www.jointcommissioninternational.org/Accreditation-and-Certification-Process/> Accessed January 19, 2014.
42. The Health Quality Service (HQS) UK Accreditation Forum; 2011: <http://www.ukaf.org.uk/HQS.htm> Accessed January 19, 2014.
43. ISO: [http://www.iso.org/iso/home/standards/management-standards/iso\\_9000.htm](http://www.iso.org/iso/home/standards/management-standards/iso_9000.htm) Accessed January 19, 2014.
44. Dutch Institute for hospital accreditation: <http://en.niaz.nl/> Accessed January 19, 2014.
45. Baldrige Award: <http://www.nist.gov/baldrige/> Accessed January 19, 2014.
46. Institute Dutch Quality: <http://www.ink.nl> Accessed January 19, 2014.
47. Institute for Innovation and Improvement, The Productive Ward: Releasing time to Care, Learning and Impact Review. Executive Summary. Warwick, 2010.
48. Robert G. Progress of the Productive Ward. *Nursing Times* 2011;107:7.
49. DGS, Campanha de Higiene das Mãos: <http://www.dgs.pt/ms/3/pagina.aspx?codigos=5514&back=1&codigono=00380049AAAAAAAAAAAAAAAAAAAA> Accessed January 19, 2014.
50. DGS, Orientação de Boa Prática para a Higiene das Mãos nas Unidades de Saúde: <http://www.dgs.pt/ms/3/paginaRegisto.aspx?back=1&id=16279> Accessed January 19, 2014.
51. Azevedo H, Mateus C. Cost effects of hospital mergers in Portugal. *The European Journal of Health Economics* 2013;1-12.
52. Bate P, Mendel PJ, Robert G. Organizing for Quality: The Improvement Journeys of Leading Hospitals in Europe and the United States. Oxford: Radcliffe Publishing, 2008.
53. Bejerot E, Hasselblad H. Professional autonomy and pastoral power: the transformation of quality registers in Swedish healthcare. *Public Administration* 2011;89 (4):1604-1621.
54. Karlsen JE, Lindøe PH. The Nordic OSH model at a turning point? Policy and Practice in Health and Safety 2009;14:17-30.
55. Greenfield D, Braithwaite J. Health sector accreditation research: a systematic review. *International journal for quality in healthcare* 2008;20 (3):172-183.

56. Braithwaite J, Shaw CD, Moldovan M, et al. Comparison of health service accreditation programs in low-and middle-income countries with those in higher income countries: a cross-sectional study. *International Journal for Quality in Health Care* 2012;24 (6):568-577.
57. Greenfield D, Pawsey M, Hinchcliff R et al. The standard of healthcare accreditation standards: a review of empirical research underpinning their development and impact. *BMC health services research* 2012;12 (1):329.
58. Shaw CD, Braithwaite J, Moldovan M, Nicklin W, Grgic I, Fortune T et al. Profiling health-care accreditation organizations: an international survey. *International Journal for Quality in Health Care* 2013;25 (3):222-231.
59. Weggelaar-Jansen AM, Van Wijngaarden J, Slaghuis S. Do Quality Improvement Collaboratives match dominant Learning Styles?. Chapter 5 of this thesis.
60. Sorensen AV, Bernard SL. Accelerating what works: Using qualitative research methods in developing a change package for a learning collaborative. *Joint Commission Journal on Quality and Patient Safety* 2012;38 (2): 89-95.
61. Chuang S, Inder K. An effectiveness analysis of healthcare systems using a systems theoretic approach. *BMC health services research* 2009;9 (1):195.
62. Gibberd R, Hancock S, Howley P, Richards K. Using indicators to quantify the potential to improve the quality of healthcare. *International Journal for Quality in Health Care* 2004;16 (1):i37
63. Scott IA, Ward M. Public reporting of hospital outcomes based on administrative data: risks and opportunities. *Medical Journal of Australia* 2006;184 (11):571.
64. Ngo D, Den Breejen E, Putters K, Bal R. Inspecting the quality of care in changing healthcare systems. An international comparison. Rotterdam: iBMG, 2008.
65. Greenfield D, Pawsey M, Braithwaite J. Letter to the Editor: A Peer-To-Peer Model to Improve Patient Safety Harnessing Accreditation Programs. *American Journal of Medical Quality* 2012;27 (4):353-354.
66. Schmaltz SP, Williams SC, Chassin MR, et al. Hospital performance trends on national quality measures and the association with joint commission accreditation. *Journal of Hospital Medicine* 2011;6 (8):454-461.
67. Burnett S, Renz A, Wiig S, et al. Prospects for comparing European hospitals in terms of quality and safety: lessons from a comparative study in five countries. *International journal for quality in healthcare* 2013;25 (1):1-7.
68. VMS Zorg: <http://www.vmszorg.nl/10-Themas/Vitaal-bedreigde-patient/Tools-Extras-abc> Accessed January 19, 2014.
69. I tygge hender: <http://www.pasientsikkerhetskampanjen.no/> Accessed January 19, 2014.





# 4

## **Learning to Improve: The Learning Organization in a Quality Improvement Collaborative in Dutch Hospitals**

*Anne Marie Weggelaar-Jansen, Jeroen van Wijngaarden, Roland Bal*

*Based on:*

*Weggelaar AM, Van Wijngaarden J, Bal R. Leren verbeteren - Verbeterd leren: Leren in een Quality Collaborative in Nederlandse Ziekenhuizen.*

*M & O 2007; 6:48-64.*

*and*

*Weggelaar AM, Van Wijngaarden J, Bal R. Leren in een Quality Collaborative.*

*Sigma 2008; 2:4-8.*



## 4.1 Introduction

Research has shown <sup>[1]</sup> that only a small percentage of proven best practices are translated into daily healthcare practice within a few years. The utilisation of written sources such as articles and clinical guidelines, the use of indicators, evaluations and feedback systems like accreditation and peer feedback seem to have only a limited effect <sup>[1,2]</sup>. Spreading insights with the help of key figures and opinion leaders seems most promising but is no guarantee of success <sup>[1,3]</sup>. Thus, the spread and implementation of best practices is hampered. Since 1990, the **quality improvement collaborative** (QIC) methodology has been used to spread the best practices aimed at improving healthcare quality <sup>[4]</sup>.

According to Øvretveit et al. <sup>[5 p. 345]</sup> “[a] collaborative brings together groups of practitioners from different healthcare organizations to work in a structured way to improve a specific aspect of the quality of their service. It involves them in a series of meetings to learn about best practices in the area chosen, about quality methods and change topics, and to share their experiences of making changes in their own local setting.” In their overview Øvretveit et al. identified various types of QICs and describes differences in their goals and focus, the number of involved organizations (ranging from 28 to 92), the availability of (financial) means and the manner of working (together) <sup>[3,5,6,7]</sup>. However, they showed that all of these QIC elements are similar with respect to:

- The involvement of teams from various organizations that aim at achieving improvements in a particular theme coupled to best practices.
- The methods employed to achieve improvements in their own organization by implementing small changes and to evaluate these changes with respect to their contribution to achieving pre-set measurable goals.
- Learning methods arranged in three ways:
  - Learning from experts in the content of the theme and the change methodology.
  - Learning within the network of participants.
  - Learning within the participating workgroups/teams.
- Gaining new insights through sharing information at collective (virtual) meetings on how well individual teams succeeded (or not) in achieving their goals <sup>[5,6,8,9]</sup>.
- These four elements, especially the last two, show that a QIC can be seen as a temporary learning organization.

Learning includes internalising implicit/tacit and explicit knowledge <sup>[10,11]</sup> and

developing skills and attitudes by utilising this knowledge in the next context or situation <sup>[12]</sup>. **A learning organization** supports both individual learning and group learning activities between individuals <sup>[13,14,15]</sup>. The literature on learning and learning organizations draws a distinction between single- and double-loop learning <sup>[15]</sup>. Single-loop learning involves detecting and correcting problems without changing the underlying values. Single-loop learning is associated with incremental change and continuous improvement of processes. It fits seamlessly in improvement work, the aim of QICs. Double-loop learning is about changing underlying perspectives and values of (groups of) individuals. Looking from a different perspective or paradigm, new ways of organizing and solving problems become apparent <sup>[15]</sup>. Double-loop learning is not easily gained, especially by highly educated people <sup>[16]</sup>, but it is an important mechanism to sustainably change the way employees work on quality issues. Thus, a QIC should transfer implicit and explicit knowledge; it should support single- and double-loop learning, and develop the skills and attitudes of participants.

Although a QIC has become a popular approach to spreading and implementing best practices, literature about its effectiveness is inconclusive <sup>[17,18]</sup>. One explanation is that researchers mostly depend on data collected by the participating teams. These data are often incomplete and biased. With regard to the effectiveness and organization of the QICs' learning network, no research has yet been done. Our research question was: *What are the preconditions for a QIC to function as a (temporary) learning organization?*

Our case concerned the Dutch QIC of 24 hospitals which ran from 2003 until 2008: **Faster Better** <sup>7</sup>. Three groups of eight hospitals aimed to achieve substantial improvements in the areas of logistics, safety and patient participation. During a two-year period, each hospital was expected to take part in a minimum of fifteen projects. All the projects were based on best practice and the latest scientific insights. The ultimate goal of this programme was to change the culture and structure of the participating hospitals, so they would automatically strive for continuous improvement of quality <sup>[19]</sup>.

## 4.2 Research methods

No systematic reviews have been published on the preconditions of learning organizations. Therefore this research began with a scan of often used publications about learning organizations to develop a **framework of preconditions**

**for a learning organization.** Based on this scan we selected six authors with differing perspectives on learning organization preconditions for a comparative analysis. This resulted in a framework of six preconditions seen as important enablers for a learning organization. This framework was used as an evaluation tool to assess the Faster Better QIC approach done based on data collected by the authors in various ways.

All authors were involved in the Faster Better programme. As Faster Better advisers, two authors were assigned to four hospitals. One author was also assigned as a programme team member on one of the logistical sub-projects and one author was a member of the board of directors of the programme. The authors used action research methods to collect data <sup>[20-22]</sup>. As adviser, project team member and board member the authors attended numerous national conferences and meetings in the four hospitals. As **action researchers**, they could observe, read and ask questions. Action research is a process-oriented research methodology grounded in experience; it is used in healthcare for identifying and improving problems in practice <sup>[23,24]</sup>. Action research is by nature participatory, with researchers and their 'study objects' working together, rather than doing research on 'study objects'. This is a crucial for our research as involvement in the QIC and collaboration with participating project members is needed to generate more insights on practical problems and how to solve this. As described by Susman and Evered <sup>[25]</sup>, action research implies a contextualised cycle process, in which research findings can be used to change the studied practice. Although we performed the analysis presented here after the QIC was finished, we nevertheless intervened on the basis of gained insights during the QIC.

To collect rigorous data, one author kept a daily reflective journal <sup>[26-28]</sup> with a chronological description of the experiences, observations and systematic reflections on the project. In addition, relevant documents were collected, including project books, evaluation reports, minutes, notes and memoranda. The data was analysed with thematic manual coding based on the seven preconditions. To guarantee the validity and reliability of this study, the findings were presented to the other advisers and programme members of Faster Better QIC. In addition, we used a group of scientific colleagues, who had not participated in the Fast Better QIC, for peer debriefing.

#### **4.2.1 Conceptual framework**

Since no systematic reviews have been published on the preconditions of

**Table 4.1** Preconditions of organizational learning

Argyris <sup>[20]</sup>	Senge <sup>[15]</sup>	Nonaka and Takeuchi <sup>[10,11]</sup>
<p>Ideologies associated with learning, such as total quality, continuous learning, excellence, openness, and boundary crossing.</p> <p>Information systems that provide fast, public feedback on the performance of the whole organization and its various components;</p> <p>Mechanisms for surfacing and criticising implicit organizational theories of action, cultivating systematic programmes of experimental inquiry;</p> <p>Measures of organizational performance;</p> <p>Systems of incentives aimed at promoting organizational learning;</p> <p>Flat, decentralised structures.</p>	<p>Building a shared vision: the practice of unearthing shared 'pictures of the future' that foster genuine commitment;</p> <p>Personal mastery – the skill of continually clarifying and deepening our personal vision;</p> <p>Mental models; the ability to unearth our internal pictures of the world, to scrutinise them, and to make open to the influence of others;</p> <p>Team learning: the capacity to 'think together' gained by mastering the practice of dialogue and discussion;</p> <p>Systems thinking: being able to see the whole of the system, instead of only the parts.</p>	<p>Develop a vision on the knowledge domain of the organization;</p> <p>Create opportunities for (intensive) interactions;</p> <p>Engage in experiments (leave room for creativity, flexibility and tolerate mistakes);</p> <p>Employ innovators from different backgrounds, and stimulate them;</p> <p>Create an organization consisting of different layers to create and accumulate knowledge;</p> <p>Middle managers must bridge the gap between abstract visions of the top and everyday practice, to stimulate creativity (hierarchies, task groups, culture/technology/vision);</p> <p>Engage in direct communication with clients on the product or service.</p>
Dixon <sup>[30]</sup>	Garvin <sup>[31]</sup>	Popper <sup>[32]</sup>
<p>Information and expertise that are distributed;</p> <p>Egalitarian values (requiring freedom, equality and respect);</p> <p>Organization size and physical arrangement support frequent interaction between subsystems;</p> <p>Processes and skills that facilitate organizational dialogue.</p>	<p>Broad base of contributors and data-sources;</p> <p>Process of sharing diverse perspectives and points of view;</p> <p>Willingness to embrace contradictory, unexpected findings;</p> <p>Process of conflict and debate to test prevailing views;</p> <p>Provision of timely, accurate feedback;</p> <p>Incentives to encourage new approaches;</p> <p>Creating space for learning;</p> <p>Sense of psychological safety.</p>	<p>Valid information: complete, undistorted and verifiable information;</p> <p>Transparency: the willingness to hold oneself and one's actions open to inspection to receive valid feedback;</p> <p>Issue orientation: is information evaluated strictly on merit, ignoring irrelevant attributes such as the social standing of the source or recipient;</p> <p>Accountability: holding oneself responsible for one's actions and their consequences and for learning from them.</p>

learning organizations, we consulted the literature to develop a framework of preconditions for a learning organization <sup>[10,11,13,15,20,29-32]</sup>. Easterby-Smith et al. <sup>[13]</sup> make a distinction between authors who study organizational learning as either a technical or social process.

The **technical perspective** assumes that organizational learning is about the effective processing, interpretation of and response to information, both inside and outside the organization <sup>[13]</sup>. Learning is regarded as a rational process in which people use available information to gain the best results for the organization. The focus is on removing obstacles that hinder the free flow of information, thereby looking mainly at explicit information (or knowledge) about performance. In other words, it is basically about rationalising the processing of information.

The **social perspective** focusses on the way people make sense of their experiences at work and learn from/with each other in work settings <sup>[13]</sup>. Not only explicit or codified information is relevant for learning, but also more tacit forms of experience; knowledge that is taken for granted, and hence, is difficult to articulate explicitly <sup>[33]</sup>. For effective performance, people cannot rely on formal instructions alone. Much learning also takes place through repetition and socialisation; that is, by observation and imitation <sup>[11]</sup>.

In developing this theoretical framework, we used four books that have become part of the canon of organizational learning theory. According to Easterby-Smith et al. <sup>[13]</sup>, two <sup>[15,20]</sup> use a more technical perspective, while the other two books use a more social perspective <sup>[10,30]</sup>. We added two publications that elaborate on enablers for the development of a learning organization. The article by Popper and Lipshitz <sup>[32]</sup> written from a more technical perspective, leans heavily on publications by Argyris <sup>[16,20]</sup>. Garvin <sup>[31]</sup>, using a more social perspective, looks at cultural and political influences on learning in organizations. Table 1 summarises the views on preconditions for learning organizations that we took from the literature.

Consulting these six publications, we constructed the following list of six preconditions for a learning organization, selecting enablers mentioned by at least two authors:

1. A shared vision of a desirable future state.
2. Procedures for generating information on performance.
3. Communication channels for the spread and (collective) interpretation of information.
4. Decentralised responsibilities for implementing changes and

experimentation.

5. Skills to individually and collectively (through dialogue and discussion) analyse and improve performance.
6. A learning culture in which members are continuously trying to learn from experience, are willing to experiment, and collect, share and discuss information (and knowledge) about their performance.

## 4.3 Findings

The six preconditions from the evaluation framework are used to present our findings. We describe the Faster Better QIC from both the social and technical perspectives. In addition, we consider some improvement points for future quality QICs.

### 4.3.1 A shared vision of a desirable future state

From the technical perspective, the significance of a shared vision related to the presence of concrete, measurable goals and targets in which the participants are formally connected. From the social perspective, the accent lies more on a shared vision that perhaps is not totally concrete, but fosters the collaboration and learning of (groups of) individuals as it gives them a shared sense and purpose <sup>[10,11,15]</sup>.

From the **technical perspective** the Faster Better QIC project teams made significant efforts to define measurable goals for each project in the areas of safety, logistics and patient participation. For example, reducing access time to the outpatient clinic to less than one week or reducing the number of postoperative wound infections by 50%.

The board of directors of hospitals were asked to show their commitment to these centrally set goals by signing a contract with the Faster Better organization. The hospitals differed in how they used the goals. Some boards of directors made few formal agreements with the participating project teams for these targets. Others added the goals to their planning and control cycle (sometimes in a dashboard), used data and asked for feedback reports from teams to steer the achievement of results. Often, boards of directors assumed that project team members are intrinsically motivated to achieve the goals. However, we noticed that external pressure helps to maintain the focus. In some projects, external

actors like the Ministry of Health, the Healthcare Inspectorate, health insurance companies and professional associations also encouraged professionals to improve their practices.

All teams in the various hospitals should work on the same centrally set goals and use the associated indicators to measure results. However, we noticed that the teams translated and directed these goals to their own local situation, considering what they found feasible and desirable. Sometimes teams adjusted the set norms. We also noticed that teams often used their own goals, related to the centrally set goals. For instance, optimising patient information in a patient safety project or improving cooperation between departments as part of a logistical improvement project.

In the Dutch hospital context, the role of physician is complicated since physicians are not employed by the hospital (they are independently organized in small businesses) and therefore hospital managers do not have formal steering power. Physicians have considerable obstructive power, due partly to their professional autonomy. When they were not totally committed to the goals, we noticed that it was hard for management to get them involved. This was certainly the case when unpopular activities were necessary to achieve the goal. For example, extra hours in the outpatient clinic, to eliminate a backlog and reduce the access time for patients. In a number of projects, it appeared that once a primary goal for a physician was achieved, the willingness to commit to achieving the remaining project goals declined. For example, their aim to have a specialised nurse working for them in the outpatient clinic which was beneficial for physicians because the specialised nurse could do the provisioning of information to patients.

From the **social perspective** of shared vision and purpose: the composition and deployment of enthusiastic motivating presenters at national conferences was important.

The Faster Better QIC organization advised the participants to form multidisciplinary teams, including representatives from all disciplines and organizational departments connected to the improvement aim. The QIC organization also suggested making a physician the formal chair of the project team and having at least one manager on the team to ensure adequate support for improvements. All teams were formed like this and most were led by a physician. We noticed in practice that often the people who were keen on the changes and made changes easily were asked to be in the project team. Categorized by Rogers <sup>[3,36]</sup> as 'innovators', these people ensure the project gets off to a rapid start and are creative in their consideration of improvement activities. Our analysis revealed that they were less able to shape the transition of improvement activities to other

professionals. Frequently, their colleagues regarded them as somewhat weird, and their seemingly risky plunge into a new activity set tongues wagging. Others watched to see whether the innovators prospered or failed in new endeavour, and waited before joining in. A literature review by Greenhalgh et al. <sup>[3]</sup> showed that employees responsible for diffusing improvement should be authoritative opinion leaders, socially respected, reliable experts, and accepted by their peers <sup>[36,37]</sup>.

To a large extent, the context of the learning organization was the centrally organized conferences. These national conferences were directed at inspiring participants with experienced-based talks by physicians who acted like successful experts. Their talks at the first meeting rated well, with team members saying they found them inspiring. They made it seem easy to accomplish results. In addition, during the first conferences time was set aside for project teams to work on the initial joint process of problem analysis and developing a shared vision of the desired situation. The teams were encouraged to translate the problems and desired future into the national set goals. This was not an inspiring process for every team, because the vision of some was only modestly connected to the nationally set goals.

Hospitals took advantage of the internal experts to motivate others to achieve the set goals. The hospitals organized symposia, wrote articles on the projects for the staff magazine, and arranged organization-wide discussions of results. Using the same (peer) opinion leaders both in the hospital and at the national conferences presented challenges for peers on the project team. We noticed that at times the opinion leader was not able to share their insights in accordance with group norms and their message was not always put forward properly.

### 4.3.2 Procedures for generating information about performance

In the technical perspective, the main issue is generating solid data from measurements that reveal something about performance <sup>[32]</sup>. Different forms of information are crucial in the social perspective, including personal and shared experiences, impressions and interpretations <sup>[10,30,31]</sup>.

From a **technical perspective** 'Measuring is gaining knowledge' was the central motto in the Faster Better programme. The QIC organization developed process and outcome indicators and related measuring tools (spreadsheets) for the collection and analysis of data per sub-project. During each project, goals were measured at a local level to see whether they were achieved. Data was collected from point zero and centrally set measurements were collected later for

the programme evaluation and feedback to the teams.

From a **social perspective** Healthcare professionals carried out as many independent measurements as possible to gain trust in the data. Preferably they interpreted the data together and considered interventions to further improve the short cycle. Several hospitals held project reviews with the team project members when they determined that not only the goals were important, but also what is learned (success and failures) and what needs to be changed in the organization to sustain the achieved results.

Thus, from both **technical and social perspectives** Faster Better had procedures suitable for generating information. The short cyclical improvement approach applied centrally set indicators with measurement templates to gain both explicit (measurements) and implicit (experience) information. However, we noticed that in the communication with others, the measures and achieved results, based on a comparison of the centrally set indicators, were often dominant in explanations of the success of a project. If a team had not made substantial improvements within the prescribed time, accordingly to the measurements, others often perceived the project as a failure. This applied both within the hospital, as well as on the QIC level. This was very disappointing for project team members, because sometimes they had indeed achieved good results but had a temporary fall back when the final measurements were taken, or they came up with solutions which took a bit longer to implement. For example, one outpatient clinic reduced patient access time by more than three months, but due to problems in a nearby hospital, more patients than usual wanted appointments, resulting in an increase in the access time. Another example involved rebuilding a bathroom into a medication preparation room to reduce dispensing errors. This could only take place in the summer when the ward was closed. Being evaluated on goals and in timeframes that were sometimes beyond the control of teams led to frustration amongst team members.

### **4.3.3 The presence of communication channels for the spread and (collective) interpretation of information**

The technical perspective places the emphasis on tools (preferably information systems) that ensure that information arrives unchanged to all those involved <sup>[20]</sup>. The social perspective focusses on opportunities for contact (formal and informal) to give joint meaning to information and experiences <sup>[15,30]</sup>.

From the **technical perspective** the Faster Better QIC used various communication channels, both within and between hospitals. Communication channels were aimed at the sub-projects and hospital teams as well as the total QIC programme. Faster Better used newsletters, a public website with vignettes of successful projects, magazine publications and a digital channel to transfer and spread information. The digital channel (closed website) made it possible to store documents, exchange information and share insights. Using a list-server tool, QIC participants could make electronic contact with other hospitals, post comments or ask questions. From the technical perspective, QIC participants could be connected via the various Faster Better communication channels and information could therefore flow freely. However, we noticed that the list-server tool that contributed especially to the dialogue between members was hardly ever used. Project members hesitated to use the new technology, and since nobody made the first attempt, it did not bloom. This led to using the communication channels to transfer information, and not enough discussion, dialogue or experience-sharing, all important from a social perspective.

From the **social perspective** national conferences and sub-project leaders' meetings were key. Each project team could attend these meeting for one year. Presentations were given at the conferences and members were given the opportunity to present their results and share experiences with other project groups. Given the main methodology of a QIC is the formation of a learning network, we noticed that conferences were especially important places where project team members could retrieve information. In most hospitals we noticed that as soon as project team members gained the impression that they had to contribute more than they retrieved, they stopped attending the organized meetings. When teams that could contribute a lot stopped attending national conferences, a substantial part of knowledge development and transition stopped. The QIC team struggled to make the programme attractive and find the 'right' level of information, but it was hard since members did not form a homogeneous group. Project members differed in function, education, work experience and experience with improvement projects.

We also noticed that the programme leaders and advisers of the Faster Better QIC played an important role in spreading information to the teams in hospitals. Programme leaders used different kinds of meetings to transfer knowledge and stimulate mutual exchange of experiences and with that, the transition of information.

#### **4.3.4 Decentralised responsibilities for implementing changes and experimentation**

The technical perspective decentralises responsibilities for change, focussing on generating explicit information (e.g. the basis of measurements) to identify the best (rational) approach <sup>[32]</sup>. The social perspective focusses on joint gaining of experience producing shared interpretations of a situation and acquiring both explicit and implicit knowledge <sup>[30]</sup>.

The methodology technical perspective adopted for most Faster Better sub-projects was the Breakthrough Method from the Nolan Cycle <sup>[37]</sup>. The Breakthrough methodology focusses on rapid cyclical improvements, particularly in the Do phase of the Plan-Do-Study-Act cycle <sup>[37]</sup>. Although the ultimate goal of the Faster Better programme was to develop infrastructure for continuous improvement in hospitals, Breakthrough and the Nolan Cycle were seen as one activity of the QIC programme. We noticed that it was hard for teams to maintain the rapid cyclical improvement methodology as soon as they achieved a goal. And even if the project had not finished yet, it was hard to keep the methodology going. Project members said that when a project stops the teams collapse and the privilege to experiment expires. They felt that the possibility to test interventions was limited. We saw that line management put the problem of sustainability on the agenda, asking for more knowledge on how to sustain achieved results.

Nevertheless, during the project, project teams were given as much space as possible to experiment with interventions and see what worked (**social perspective**). Occasionally we saw teams that found it hard to experiment. At meetings, they were mainly interested in devising the perfect design. As described in the literature, separating development upfront from implementation afterwards leads to all kinds of change methodology problems <sup>[6,37]</sup>. In some hospitals, the project leader and adviser took up the task of helping teams to try out small-scale changes and especially, experiment with possible solutions. They advised the teams to implement only the proven successful experiments and anticipate feasible changes.

#### **4.3.5 Skills to analyse and improve performance, individually and collectively**

The technical perspective emphasises skills for processing information results and

adequate measurement and interpretation of data [20,32]. The social perspective emphasises skills in a group dialogue and discussion, so that a shared meaning and making sense emerges [15,30,31,38].

In the Faster Better programme, QIC participants were given information to manage their improvement processes. At conferences, teams were provided with information on taking and interpreting measurements, analysing processes and rapid cycle improvements. We noticed that the information concentrated especially on **technical skills**, such as setting up measurements, making a flow diagram, and prospective risk analysis.

Less attention was given to the **social side of improvement**, such as conducting dialogues, chairing effective meetings and communication with key stakeholders. Many team members are healthcare professionals and these social skills are not part of their professional training. In some hospitals the adviser took up this task in their guidance of project teams. However, this was not part of the formal development aims/strategy for project team members.

#### **4.3.6 A learning culture in which members continuously try to learn from experience, are willing to experiment, and collect, share and discuss information (and knowledge) about their performance**

Having the right incentives and culture in which people can learn from mistakes rather than being punished for them is especially emphasised in the **social perspective**. It concerns the presence of a culture that allows people to constantly learn from experiences, where they feel motivated to take risks and where information is shared freely. Core values are trust, cooperation, transparency, equality and accountability. Such a culture exists only if there are incentives for innovation and risk-taking without direct sanctions if something goes wrong [20,30,39,40].

Faster Better focussed on the content of the projects (reaching goals) and **technical skills**. Less attention was paid to social skills. The main learning style the QIC programme team used was knowledge transfer and participation between team members [41]. Learning styles such as exercising, apperception (observing and imitating) and discovery were given little support [41]. Although for example a project team of one of the national projects distributed a list of successful interventions used in the participating hospitals, including address

information to stimulate mutual learning, this was an exception. The presence of a learning culture is often connected to the project phase during which the team experiences the benefit of shared learning and trust in each other. In this phase, team members feel stimulated by new information, experiences and insights. After the project phase, the teams usually disintegrated, and we noticed that the core values at work in the team to stimulate learning dissipated. The learning culture developed during the project phase did not transfer to other employees. In only one project did the team begin at an early stage to consider how they could best distribute the new methodology and learning culture to fellow employees. Perhaps this was done later on; however, we did not collect data on this.

A learning culture is not simple to introduce; it takes time and effort. The Faster Better hospitals and often the teams as well selected people who claimed that they stood behind the above-mentioned core values. Nevertheless, there was a large variation in the practical effects. At the conferences, we met team members who were open and focussed on joint learning and developing their own skills. We also met team members who especially wanted to copy what others had considered useful and became disappointed if they failed to achieve the same results. The research by Tucker et al. <sup>[42]</sup> showed that healthcare professionals are good at resolving problems that arise in their daily routine. They are less accustomed to problems seen from an analytical view and searching for patterns that cause the problems. The result is a large decrease in the potential of organizations to learn and prevent structural problems. Tucker et al. <sup>[42]</sup> suggest that healthcare professionals should learn and take the time to do cause-effect analysis daily. We noticed that in most hospitals, giving feedback and openly discussing problems did not happen often and they seldom organized moments where team members can share experiences of improvement topics and improvement methods.

## 4.5 Discussion

Our research question was: What are the preconditions for a QIC to function as a learning organization? Based on the evaluation of the Faster Better QIC case presented in this article, we conclude that the six preconditions we retrieved from the literature could lead to a well-functioning learning organization. We argue that more attention should be paid to the **social perspective of the six preconditions**. The chosen change approach, Breakthrough, with rapid

cycle improvements, put strong emphasis on making formal agreements with quantified targets, on learning technical skills to measure, analyse and interpret results, and on establishing different communication channels for the flow and transfer of information. The social perspective was not ignored, but received less attention. As for sharing and interpreting both solid data and personal experiences, the conferences did not give much attention to social aspects, such as involving stakeholders and spreading the knowledge gained through their own organizations. Most project teams gave limited attention to having a dialogue and making sense or giving meaning to findings. We also encountered the difficulties of keeping the learning organization running after the project phase. The Faster Better QIC introduced a learning system that complied with many conditions of a learning organization. However, we found several vulnerable points that require resolution, especially focussed on strengthening the social learning areas.

First, team members (on behalf of their discipline or organizational department) need to discuss the various goals more thoroughly and then come up with related indicators and required measures. Questions that should be answered include: what is good, what could be better and so what do we need? Second, the team members need to support learning with explicit (measurements) and implicit information (experiences) to determine the lessons learned during the project. These lessons can be shared in their own hospitals and on the QIC level. They are important to sustain the achieved results and keep the engine of continuous improvement running. The comparative analysis by Øvretveit et al. <sup>[6]</sup> showed that the developing team members during a QIC centre on the improvement methodology used, rather than the specific improvement goals of the QIC. Several qualitative evaluation studies (not effect studies) showed that participants felt that they made significant improvements <sup>[5,6,17]</sup>. One can question if these improvements are sustainable.

Our research data was limited to the two years that the four studied hospitals participated in the QIC. More research is needed on the sustainability of the learning organization climate and how hospitals learn to keep a continuous improvement cycle running. The third vulnerable point is that more attention should be paid to embedding project members in the hospital. Our findings revealed doubts about feasibility and sets an example by 'living' the improvement. Fourth, using peer opinion leaders can be beneficial, but they do need encouragement and support. A literature review by Greenhalgh et al. <sup>[3]</sup> on the diffusion of innovations showed that peers should regard the employees responsible for diffusion of improvement as authoritative opinion leaders, socially respected, reliable and acceptable. Locock et al. <sup>[43]</sup> distinguishes expert and peer opinion leaders in the healthcare sector. The expert opinion leader is an academic

with an (inter)national reputation. They are used especially for removing doubt about the value of new insights and to explain what needs to be done. The peer opinion leader is one of the group and understands the group culture and organization values well. A peer opinion leader can be used to remove the learning network context of the Faster Better QIC, especially focussed on knowledge acquisition and participation learning style. We suggest facilitating also other learning network contexts such as exercises and apperception. For instance by using contemplating chat sessions with experts, telephone conferences and working visits to other hospitals.

QICs are not just learning organizations. The ultimate aim of a QIC is to support participating hospitals in the development of a learning organization such that quality improvement becomes part of everyone's daily job. Learning should play a central role in both the QIC network of healthcare organizations as well as the participating organizations. On various levels – QIC, hospital, department, project, and professional – attention should be paid to what is learned in a particular improvement project. Many authors state that organizational learning is the same as collective learning <sup>[30,32,34]</sup>. Collective learning occurs through a dialogue between members <sup>[30]</sup>. Collective or shared interpretations become part of the structure (procedures, tasks, policy) or culture of the organization (or network). Organizational (or network) learning is "the capacity of processes within an organization (or network of organizations) to acquire, share and utilise knowledge in order to maintain or improve performance" <sup>[44 p. 362]</sup>. Since learning from a social perspective is not seen as rational, the same information can have different meanings for other people. Meaning is constructed and is mostly part of a (social) process involving various people. Therefore, organizations should pay more attention to moments of reflection to share views and experiences. Nonaka and Takeuchi's <sup>[11]</sup> state that four environments (the so called Ba's) should be in place for knowledge creation. Such political processes are seen from a technical perspective as disruptive to goals and should be overcome. From a social perspective, politics are an inevitable, integral part of any social process. Easterby-Smith et al. state that in learning organizations research there is "a particular shortage of studies that attempt to induce theory from existing practice, use a small sample of in-depth cases, focus on micro-practices within organizational or trans-organizational settings and study processes leading to learning outcomes" <sup>[13 p.113]</sup>. This study helps to fill this gap. Action research seems to have a good potential in improvement projects, but not many studies have been published yet. The reason for this is unclear, but could be related to perceived problems embedded in action research methods. Action research is an emergent process with ethical, role, politics, dynamics and context issues influencing data collection <sup>[21,25]</sup>. The dual role of being an adviser of hospitals on behalf

of the QIC, QIC programme or board member and at the same time being a researcher questions the reliability and validity of the results. After all, we were part of the QIC team and partly responsible for the lack of attention paid to the social perspective of a learning organization. We discovered this after the QIC had ended, during the analysis of our data. The benefit of action research methodology is that it enabled us to obtain a close look at what was going on in hospitals during the QIC, at how QIC participants experienced several elements of the QIC and how the learning organization came to bloom or wither. Action research is by nature a cyclical process in which practice is influenced by research findings. This was not the case in our study design; therefore, we call on other QICs with comparable approaches to use the results of our 'clinical inquiry' and reflect on it from the start <sup>[22]</sup>.

## Notes

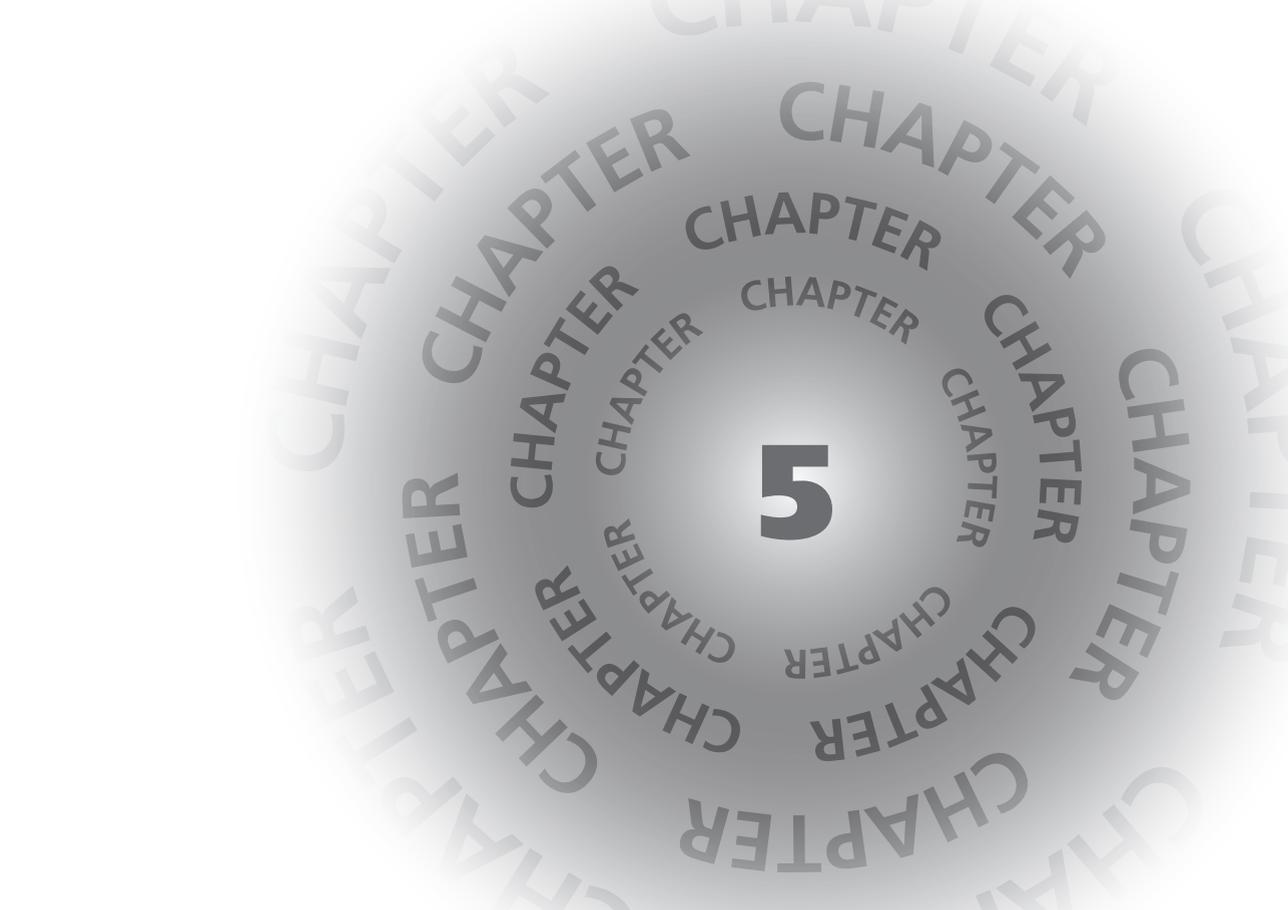
<sup>1</sup> In this article, we utilised the broad term 'Faster Better' to refer actually to 'Faster Better Pillar 3'. Faster Better was a national programme that aimed at improving transparency and stimulating efficiency and quality of hospital care. The programme contained three pillars. Pillar one focussed on comparing performance, Pillar two on developing indicators for secure and better care, and Pillar three dealt with improving quality, innovation and efficiency. The Dutch Ministry of Health financed the entire programme. Faster Better Pillar 3 was outsourced to a consortium including the Order of Medical Specialists, the Institute of Policy and Management for Healthcare, and the Dutch Quality Institute for Healthcare CBO.

## References

1. Grol R, Wensink M. Implementatie, effectieve verbetering van de patiëntenzorg. Maarsen: Elsevier Gezondheidszorg, 2006.
2. Pollitt C. Performance management in practice: a comparative study of executive agencies. *Journal of Public Administration Research and Theory* 2006;16 (1):25-44.
3. Greenhalgh T, Robert G, Bate P, Macfarlane F, Kyriakidou O. Diffusion of Innovations in Health Service Organizations, a systematic literature review Oxford: BMJ Books, 2005.

4. Wilson T, Berwick DM, Cleary PD What Do QIC Improvement Projects Do? Experience from Seven Countries Joint Commission Journal on Quality and Patient Safety 2003;2 (2003):85-93.
5. Øvretveit J, Bate P, Cleary P, et al.. Quality collaboratives: lessons from research Quality and Safety in Health Care 2002;11:345-351.
6. Øvretveit J. Gustafson D. Evaluation of quality improvement programmes Quality and Safety in Health Care 2002;11:270-275.
7. Batalden PB. Davidoff H. What is "quality improvement" and how can it transform healthcare. Quality and Safety in Health Care 16 (2007) 2 p. 97-98
8. Bate P, Robert G, McLeod H. Report on the Breakthrough QIC Approach to quality and service improvement within four regions of the NHS. Birmingham: The University of Birmingham, 2002.
9. Mittman BS. Creating the Evidence Base for Quality Improvement Collaboratives Annals of Internal medicine 2004;140 (11):897-901.
10. Nonaka I, Takeuchi H. The knowledge-creating company: how Japanese companies create the dynamics of innovation. New York: Oxford university press, 1995.
11. Nonaka I, Toyama R, Konno N. SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. Long range planning 2000;33 (1):5-34.
12. Illeris K. How we learn: Learning and non-learning in school and beyond. New York and London: Routledge, 2007.
13. Easterby-Smith ML, Burgoyne J, Araujo L. Organizational learning and the learning organization: Developments in theory and practice. London: Sage publications, 1999: 3-8.
14. Stacey, R. Learning as an activity of interdependent people. The Learning Organization, 2003; 10 (6):325-331.
15. Senge PM, The fifth discipline: the art & practice of the learning organization. New York: Doubleday, 1990.
16. Argyris C. Teaching smart people how to learn. Boston: Havard Business Press, 1996.
17. Schouten LMT, Hulscher MEJL, Everdingen JE van, Huijsman R, Grol RPTM. Evidence of the impact of quality improvement collaboratives: systematic review. BMJ 2008;336:1491-1494.
18. Vos L, Dückers M, Wagner C. Evaluatie Sneller Beter pijler 3: resultaten van een verbeterprogramma voor ziekenhuizen. Utrecht: NIVEL, 2008.
19. Bal R, Pijnenborg L. Sneller Beter pijler 3: Een tussenstand. ZE Magazine 2007;1: 28-33.
20. Argyris C. On organizational learning. Oxford: Blackwell Publishers Ltd, 1999.
21. Coughlan P, Coughlan D. Action research for operations management. International journal of operations & production management 2002;22 (2): 220-240.
22. Schein EH. Process consultation, action research and clinical inquiry: are they the same? Journal of Managerial Psychology 1995;10 (6):14-19.
23. Winter R, Munn-Giddings C. A handbook for action research in health and social care. London: Routledge, 2001.
24. Waterman H, Marshall M, Noble J, et al.. The role of action research in the investigation and diffusion of innovations in healthcare: the PRIDE project. Qualitative Health Research 2007;17:373-381.

25. Susman G, Evered R. An assessment of the scientific merits of action research. *Administration Science Quarterly* 1978;23:582–603.
26. Schein EH. *The clinical perspective in fieldwork*. London: Sage Publications Inc, 1987.
27. Kessener B. Reflecteren meer dan evalueren. *Management Consultant Magazine*, 2003;5:28-31.
28. Kessener B, Termeer CJAM. Organizing in-depth learning: change as reflective sensemaking. In: Boonstra J, De Caluwé L. *Intervening and Changing, Looking for Meaning in Interactions*. Wiley: West-Sussex, 2007:229-243.
29. Easterby-Smith ML. Disciplines of organizational learning: Contributions and critique. *Human Relations* 1997;50:1085-1113
30. Dixon MD. *The organizational learning cycle: How we can learn collectively*. Aldershot: Gower, 1999.
31. Garvin DA. *Learning in action*. Boston: Harvard Business school Press, 2000.
32. Popper M, Lipshitz R. Organizational learning: Mechanisms, Culture and Feasibility. *Management Learning* 2000;31 (2):181-196.
33. Polanyi M. *The Tacit Dimension*. New York: Anchor Books, 1967.
34. Weggeman M. *Kennismanagement: inrichting en besturing van kennisintensieve organisaties*. Schiedam: Scriptum management, 1997.
35. Rogers EM. *Diffusion of Innovations*. New York: The Free Press, 1995.
36. Lomas J, Enkin M, Anderson GM, et al.. Opinion leaders versus audit and feedback to implement practice guidelines. *JAMA* 1991;265:2202-2207.
37. Nolan K, Nielsen GA, Schall MW. Developing strategies to spread improvements In: *Joint Commission Resources Inc. From front office to front line: Essential issues for Health Care Leaders*. Chicago: Joint Commission Resources, 2005.
38. Schön DA. *The reflective practitioner: How professionals think in action*. New York: Basic books, 1983.
39. Nevis E, Anthony JD, Gould JM. Understanding organizations as learning systems. *Sloan Management review* 1995;36:73-85
40. Lockyer J, Gondocz ST, Thivierge RL. Knowledge translation: the role and place of practice reflection. *The journal of continuing education in the health professions* 2004;24:50-56.
41. Simons P, Ruijters MC. Varieties of work related learning. *International Journal of Educational Research* 2008;47 (4):241-251.
42. Tucker AL, Edmondson AC, Spear S. When problem solving prevents organization learning. *Journal of Organizational Change Management* 2002;15:122-136.
43. Locock L, Dopson S, Chambers D, Gabbay J. Understanding the role of opinion leaders in improving clinical effectiveness. *Social Science and Medicine* 2001;53:745-757.
44. Dibella AJ, Novis EC, Gould JM. Understanding Organizational Learning Capacity. *Journal of management studies* 1996;33:361-389.



# 5

**Do quality improvement collaboratives'  
educational components match  
the dominant learning styles  
of the participants?**

*Anne Marie Weggelaar-Jansen, Jeroen van Wijngaarden, Sarah-Sue Slaghuis*



## 5.1 Introduction

Many healthcare organizations are continuously working on a diverse set of improvement projects centred on the triple aim: increasing quality of care, increasing the (evidence based) care outcomes and, at the same time, reducing costs <sup>[1]</sup>. To achieve triple aim improvements several models and methods from different theoretical backgrounds are used <sup>[2,3]</sup>. **A Quality Improvement Collaborative (QIC)** combines different improvement models and methods. In a QIC, groups of healthcare professionals from different healthcare organizations are brought together to work on the improvement of a specific topic <sup>[4,5]</sup>.

QICs are described as temporary learning organizations, in which knowledge about quality improvement themes, models and methods for change, is exchanged <sup>[4, 6-8]</sup>. Integral to the QIC methodology is learning in collaboration with other participants <sup>[4,9]</sup>. Most QICs focus on three different learning levels: 1) individual learning from experts in the field of the goal theme and/or the change methodology 2) learning within the network of participating organizations 3) learning within the teams <sup>[4,9-12]</sup>. The QIC faculty organizes collective (virtual) meetings to teach team members and support sharing information between different teams <sup>[4,7,11-14]</sup>.

QICs are frequently used within Europe, the United States, Canada and Australia and are generally acknowledged for their success <sup>[10,15]</sup>. Despite their widespread use, the actual effectiveness of QICs is still in question <sup>[5,16,17]</sup>. Because learning is central to the QIC, more insight into the learning process within a QIC may help to understand how we can improve the effectiveness of QICs. Little research has yet been conducted into if, and how, learning takes place in a QIC <sup>[15-17]</sup> and how QICs facilitate the learning processes of their participants <sup>[18-20]</sup>. To understand more about how learning can be enhanced in a QIC it is necessary to gain more insight into how individual participants learn.

Research has shown that people differ in their **learning styles** <sup>[21,22]</sup>. Keefe states that learning styles are “cognitive, affective, and physiological traits that are relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” <sup>[23 p.3]</sup>. Hence, the match between the learning approach in QICs’ educational components and the preferred learning styles of the participants can influence the educational effectiveness of QICs.

This article presents the results of a mixed method research of two QICs focussing on improvement of hospital logistics. A survey was used to determine the preferred learning styles of the participants. Next, two logistic QICs were investigated using action research data aiming to explore if and how the learning approach used in the QIC matched the preferred learning styles of the participants and how this affected the learning environment of the QIC. The research

question is: Does the learning approach of a Quality Improvement Collaborative match the learning style preference of its participants and how does this affect the learning process of the participants?

### 5.1.1 Learning styles

To gain more understanding of the learning styles of the QIC participants, theoretical knowledge on different learning style models was used <sup>[27-29]</sup>. A systematic review <sup>[21-24]</sup> identified 71 learning styles models from different theoretical backgrounds: psychology, sociology, business studies, education, management and policy. The reviewers divided the learning style models into **five 'families'**, each of which emphasizes different paradigms of learning styles <sup>[25, 26]</sup>:

1. Learning styles models which reflect a perception that learning styles are largely constitutionally-based including the visual, auditory, kinaesthetic and tactile modalities.
2. Learning styles models which reflect deep seated features of the cognitive structure of individuals including patterns of ability and needs.
3. Learning styles models which reflect a perception that learning styles are one component of a relatively stable personality type and therefore use methods to assess individuals' personalities in combination with learning, such as Myers Briggs Type Indicator <sup>[28]</sup> and Jackson's Learning Styles Profiler <sup>[29]</sup>.
4. Learning styles models which aim to measure flexible or stable learning preferences of individuals (over time), such as the Learning Style Inventory <sup>[30]</sup>, Learning Styles Questionnaire <sup>[31]</sup> and 4MAT <sup>[32]</sup>.
5. Learning styles models which are linked to learning approaches, strategies and orientations, which pay a greater attention to personal factors, such as motivation, the influence of environmental factors and cooperative learning.

Because our research focused on individual learning styles related to collective learning processes and a large amount of learning activities a model from Family 5 seems appropriate to study preferences in the context of quality improvement work <sup>[33-34]</sup>. We used a relatively new, but validated, learning style tool from Family 5, based on the model of Simons and Ruijters <sup>[35]</sup>. The model was developed in a study that combines learning styles and paradigms about organizational change <sup>[36]</sup> and therefore fits well in the aims of our QIC study. In this model **five different learning styles** are distinguished <sup>[35]</sup>:

1. **Acquisition:** gathering objective knowledge (facts, theories) from experts; learning is guided by achieving a concrete result. Examples of relevant learning environments are classroom lectures, documentaries and literature study.
2. **Apperception:** observing others/examples and to imitate what works; learning from observing experienced role models and best practices. Learning under pressure, such as hectic, relatively unpredictable and constantly changing work environments. Examples of relevant learning environments are real world situations, such as site visits, shadowing and demonstration.
3. **Discovery:** jumping into new and interesting issues based on personal curiosity and fortuitous circumstances and reflecting on the experience with sagacity to discover new insights; learning and life are combined and must be interesting and inspirational. Learning is based on self-reflection and focused on knowledge creation. Examples of relevant learning environments are practical assignments, brainstorming, storytelling and open space conferences.
4. **Exercising:** practising through supervised repeated exercises in a safe 'laboratory environment'; learning takes place in training sessions which recreate realistic situations and provide the opportunity to practise new skills. Examples of relevant learning environments are role-play, simulations, workshops and skills labs with an experienced teacher to point things out or pass on knowledge.
5. **Participation:** engaging in a dialogue or discussion with others to share opinions and sharpen ideas; learning is a social event involving interaction and communication (learning from and with others). These dialogues and interactions require equality and trust among participants. Examples of relevant learning environments are peer consultation, communities of practice and case discussions <sup>[35,36]</sup>.

### 5.1.2 Learning Styles in QICs

Some research has already been carried out on how quality improvement work in healthcare is linked to organizational learning <sup>[37,38]</sup>. Murry and Chapman <sup>[37]</sup> highlight four dimensions necessary to activate the quality improvement cycle: 1) developing capabilities, 2) generative learning, 3) adaptive learning matched to the situation and 4) learning styles. In a Cochrane systematic review <sup>[39]</sup> the effects of inter-professional education on professional practice improvement and healthcare outcomes were studied. However, due to lack of evidence (only six studies could be included) no solid conclusion could be drawn. Nadeem et al. <sup>[17]</sup>

performed a systematic review on the different QIC components and how they relate to improvements in professional or patient level outcomes. Nadeem et al. <sup>[17]</sup> identified 14 crosscutting QIC components which encompass specific educational components, such as learning sessions, phone meetings, training in QI methods and teaching strategies to foster cross-site collaboration.

Only in a very few studies was a description of the **educational components** was available allowing insight into the QICs' learning processes. Hence, there is little evidence on the critical features of the educational components of QICs. In only four studies <sup>[40-44]</sup> the benefits of different QIC components with regard to the participants' learning processes were mentioned. Freemont et al. <sup>[40]</sup> conclude that learning sessions with experts and peer support are seen as helpful. Leape et al. <sup>[41]</sup> show that the results on improvement goals increased when more team members attended the learning sessions. Nembard <sup>[42]</sup> adds that the results also increased when more QIC components were used in the teams, in particular learning sessions and monthly reports. Gustafson et al. <sup>[43]</sup> conclude that learning sessions and interest circle conference calls delivered fewer improvement results compared to coaching. Nadeem et al. <sup>[17]</sup> conclude that despite the fact that many studies acknowledge the importance of learning processes in QICs, it appears that research on the combination of learning styles and the learning approach of QICs is currently lacking and there is a need for more insight.

## 5.2 Research methods

In this mixed methods research we combined a questionnaire study of learning preferences with an analysis of action research data.

### 5.2.1 Setting

We studied two QICs focussing on improving logistics in hospitals. One QIC aimed to reduce access time to outpatient clinics by using the principles of Advanced Access <sup>[44]</sup>. The other QIC was focussed on reducing throughput time for patients by at least 20%, by developing clinical pathways and/or using the principles of Process Redesign <sup>[45]</sup>. Both QICs were part of Faster Better, a QIC programme across the Netherlands striving to improve the quality of Dutch hospitals. Both the logistics QICs used the Breakthrough approach <sup>[11,12]</sup> and were organized in the same way. Ethical permission for this study was not necessary under Dutch law as no patient data was collected. Every participant in both QICs

was informed about the study and gave approval for using the data.

## 5.2.2 Methods: survey study

**Measurement instrument:** To assess learning styles a questionnaire developed by Ruijters and Simons<sup>[35,36]</sup> was used. This learning style questionnaire measures the preference for the five different learning styles environments. The questionnaire consists of 15 questions. For example: “How do you deal with errors?” or “Which competence should the ideal supervisor have?”. For each question, four or five statements based on the five learning styles were presented.

For example: “*What circumstances helps you to develop?*”

- A. Complex issues which must be resolved at short notice (learning style apperception).
- B. An inspired meeting with others (learning style participation).
- C. Environments in which many knowledge sources are present (learning style Acquisition).
- D. When there is time and space for practising (learning style Exercising).
- E. In work situations where I can come across new interesting issues (learning style Discovery)”<sup>[36]</sup>.

Some statements are relevant for two learning styles and therefore contribute to both learning style preferences. The respondents scored each statement (in total 65 statements) on a five-point Likert scale: ranging from “not applicable to me” (1), “average” (3) to “fully applicable to me” (5).

For each learning style, measurement properties were assessed; the scales of the questionnaire showed a good internal consistency (Cronbachs’  $\alpha$  ranged between 0.81 and 0.96). The results were similar to the internal consistency analysis reported by Ruijters<sup>[36]</sup>.

**Participants:** The questionnaire was distributed among all project members of 28 project teams of eight hospitals during the last plenary meeting of each QIC. Project team leaders were asked to distribute the questionnaire among those not present. A total of 170 questionnaires were distributed; 92 among the Advanced Access participants and 78 among the Process Redesign participants. The questionnaire could be returned anonymously. 142 questionnaires were returned (83.5%). In our analysis a project team was included if at least 75% of all its team members responded; 23 project teams (82.1%) were included in our study. The final sample for analysis included 12 of the 15 teams (80%) for Advance Access and 11 of the 13 teams (84.6%) for Process Redesign. 125 of the 142 returned, and of the 170 distributed questionnaires were included (73.5% response): 72

for Advanced Access (75.8% response) and 53 for Process Redesign (70.7% response).

**Analysis:** Because the educational components and learning approach of both QICs were organized in the same way <sup>[10,11]</sup> the data sets could be combined. Nevertheless, an independent samples t-test between the two logistics QIC was performed. This revealed no statistically significant differences between participants and their preferred learning style in the two different QICs. Therefore, there was no restriction to studying the group of respondents from both QICs as a whole. Analysis was performed with SPSS 19.0 software and consisted of three steps. First, the sample characteristics of the two QICs were analysed using descriptive statistics. Next, based on the learning style inventory scores two variables were constructed. First of all, for each respondent, learning style sum scores were computed based on the learning style sub-scale results for the 15 questions. In addition, the learning style sum scores were ranked to identify learning style preferences (rank 1-5). Based on these ranked scores, frequencies and percentages for the total sample were computed to indicate the extent to which the styles were preferred. Last, we explored the potential effects of differences in gender, age, professional background and project role in connection with the ranked learning style scores with ONEWAY ANOVAs; post hoc tests were computed with the Tukey's honest significant difference (HSD) procedure for pairwise comparisons of the means.

### 5.2.3 Methods: action research

This part of the study aimed to gain a deeper insight into the match between the learning style preference and the learning process of the participant. Research was focused on four different aspects: 1) how the learning approach of the **educational components** of the QIC **match** the preferred learning styles; 2) how the **educational components are perceived** by the participants; 3) how this **influences** their learning process and how the QIC contributed to increased knowledge and skills for working on quality improvement; 4) how this influenced improvement work within the participants' hospitals. These four aspects must be studied as a coherent and influencing system within a context <sup>[46-48]</sup>. Thus the four aspects were not studied as independent questions; rather we took an integrated approach seeking to discover relationships. To obtain in-depth information, a study based on action research traditions was performed. Action research is a process-oriented research methodology where the researcher participates in the routine practices of their 'study objects' <sup>[49,50]</sup>. Two authors were assigned as advisers to four hospitals participating in the studied QIC. By participating in the QICs' educational components and real-life situations in the hospitals

the researchers had the opportunity to observe what participants of the QICs actually do, instead of what respondents in an interview or questionnaire say they do. Argyris <sup>[50-52]</sup> describes this as the difference between espoused theory (what people say) and theory in use (what people actually do).

By nature action research is the ideal methodology for identifying and improving practices in healthcare <sup>[53,54]</sup>. Action research is commonly designed into five cyclical phases starting with Diagnosis and ending with Learning and Refinement <sup>[55]</sup>. In this study we only performed the first two phases: Diagnosis (identify and define the problem using a variety of data collection methods) and Action Planning (consider courses of action). The phases Implementation, Evaluation and Learning were not possible, because we were not the QIC programme leaders and performed the analysis after the QIC was finished.

**Data collection:** In the adviser role two researchers were present at the studied educational components and at more than 100 meetings within the four hospitals. Close observations <sup>[56-59]</sup> during these meetings were documented in a daily reflective project journal <sup>[59-61]</sup> with chronological descriptions and observations of facts and systematic reflections. The facts concerned the QICs' educational components, project and hospital meetings. In this project journal systematic reflections were also made on topics which were surprising or intriguing <sup>[60,61]</sup>. In addition, the researchers wrote minutes of conversations. These minutes were summarized in thick descriptions <sup>[57,58]</sup> about the opinions of hospital employees and faculty about QIC learning approaches and educational components.

**Analysis:** The project journal, reflective notes, minutes, and thick descriptions were analysed by open coding. These initial analyses identified four themes: 1) the QIC components as a temporary learning organization, 2) how the transfer of knowledge and skills progressed, 3) via which learning style this transfer occurred and 4) which aspects or conditions of the QIC educational programme were experienced as a help or hindrance in the learning processes.

Next, the initial findings were shared with one professor in Operations Management and two QIC programme leaders in two sense-making meetings <sup>[62]</sup>. The intention of the sense-making meetings was to share thoughts and beliefs about the QICs openly and on equal terms <sup>[62,63]</sup>. Themes derived from the analysis were discussed. In this way researchers were able to expose a general analysis, test their assumptions and interpretations of the data <sup>[63,64]</sup>, and reflect on issues to generate actionable knowledge about the match between learning styles and the learning approach used in the QIC educational components.

## 5.3 Findings

First, the results of the learning style survey are presented. Second, the results of the action research are described.

### 5.3.1 Survey sample characteristics

The sample comprised a variety of the major hospital professional groups: medics (e.g. physicians, fellows and residents), nurses (e.g. registered nurses, student nurses and nurse practitioners), allied healthcare staff (e.g. ambulatory physician staff, respiratory, physical and occupational therapists, dieticians and pharmacists), administrative employees to support care planning, management and other support staff (e.g. advisers and policy makers). Half of the respondents were management and other supportive staff (almost 50%), the other half were frontline professionals. The variables gender and age of the professionals comprise an average selection of hospital staff when compared against figures from 2008 from the Dutch Association of Hospitals website <sup>[65]</sup> and show similarities with these figures. See table 5.1 for an overview.

**Table 5.1** Characteristics of respondents (N = 125)

Gender	Male	32%
	Female	68%
Age	< 30 years	12.8%
	31 to 40 years	26.4%
	41 to 50 years	44.0%
	> 51 years	16.8%
Professional background	Medics	19.2%
	Nurses	11.2%
	Allied Healthcare Staff	3.2%
	Administrative employees	12.0%
	Management	28.8%
	Support staff	20.8%
	Other	4.8%
Project team' role	Project leader	20.0%
	Project team member	54.4%
	Support staff	17.6%
	Other	8.0%

**Table 5.2** Frequency counts and ranked percentage

ranking	Apperception		Participation		Acquisition		Exercising		Discovery	
	freq.	%	freq.	%	freq.	%	freq.	%	freq.	%
1	10	7.9	44	34.9	26	20.6	3	2.4	61	48.4
2	19	15.1	47	37.3	28	22.2	6	4.8	31	24.6
3	35	27.8	24	19	23	18.3	23	18.3	20	15.9
4	21	16.7	10	7.9	32	25.4	49	38.9	9	7.1
5	41	32.5	1	0.8	17	13.5	45	35.7	5	4

Legend 1= most preferred learning style, 5= least preferred learning style

### 5.3.2 Dominant Learning Styles

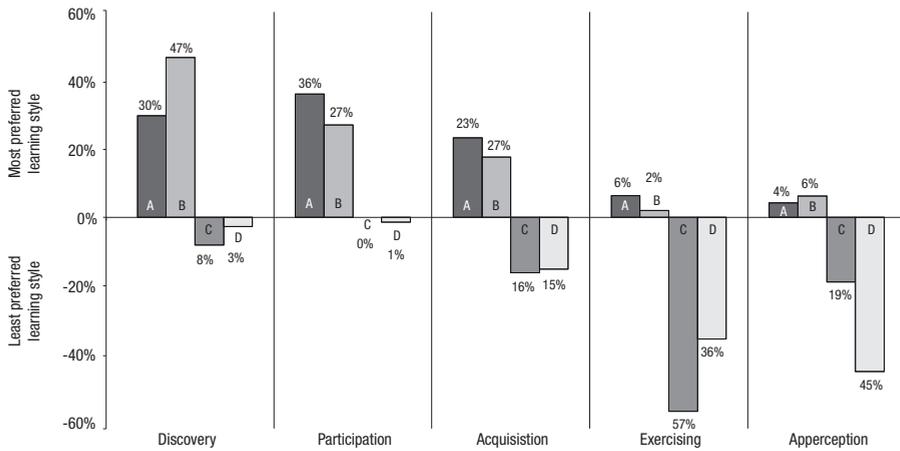
As indicated previously two variables were constructed for learning styles: individual sum scores per style and ranked scores (see table 5.2). The analysis of the preference for the calculated sum score and ranked learning style revealed that the most preferred learning styles of all QIC participants (N=125) were Discovery (calculated: M=13.5, SD=5.49; ranked: for 48.4% of participants, thus this style had the highest sumscore) and Participation (calculated: M=13.3, SD=5.01; ranked: 34.9%). Both learning styles focus on learning within a social context with other people and combine ‘real life’ experiences to learn. Discovery focuses more on individual insights whereas Participation focuses more on collectively gained insights.

The least preferred learning styles of the QIC participants were Exercising (calculated: M=7.5, SD=5.93; ranked: 35.7%) and Apperception (calculated: M=8.8, SD=4.77; ranked: 32.5%). Both of these learning styles necessitate dedicated time for learning activities. While Exercising requires a safe learning environment, the Apperception learning style benefits most from some excitement and tension in daily practice.

An exploratory analysis of the differences in learning style preferences was performed. Various ONEWAY ANOVAs tested whether differences in age, gender and professional background and project role were associated with a different sum score for each learning style.

#### Gender:

The only marginal significant difference found in gender was in the Discovery learning style ( $F(1,124)=3.64, p=0.059$ ). Males (M=12.2, SD=5.5) were less



**Figure 5.1** Percentage of the most and least preferred learning styles by gender (N=125)  
 Legend: A = most preferred by Male; B = most preferred by Female; C = least preferred by Male;  
 D = least preferred by Female

inclined to prefer this learning style compared with the females (M=14.1, SD=5.4). Men seem to have a slightly greater preference for Participation (see figure 5.1). The least preferred learning style for women was Apperception and for men Exercising.

**Age:**

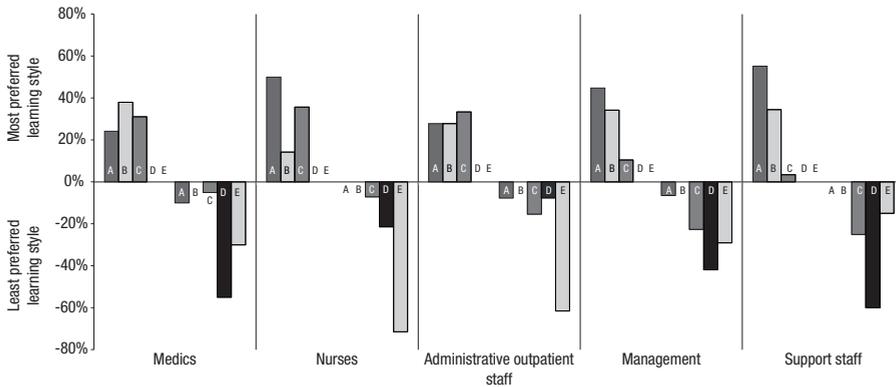
The differences between four age groups (< 30; 31-41; 41-50; >50 years old) revealed only significant differences for the learning style Acquisition (F(3,120)=3.113, p=0.03). The main difference concerns the age group 31-40 years (M=8.4, SD=6.1) and > 50 years (M=13.4, SD=7.5); the latter age group has greater preference for the learning style Acquisition.

**Project role:**

The analysis shows mostly similar preferences between project leaders and project members, except for a slight difference in preference for Exercising (F(2, 113)=3.464, Tukey HSD p=0.035).

**Profession:**

Looking at the results presented in figure 5.2 which illustrates the percentages of the ranked preferences in the different professional groups. There were several notable distinctions between the different professionals in their ranked preferences. Medics preferred Participation (M=13.3, SD=6.1) scored this as the most preferred learning style. Support staff (M=14.8, SD=5.8), nurses (M=16.8,



**Figure 5.2** Percentage of the most and least preferred learning styles by profession (N=125)  
 Legend: A = Discovery; B =Participation; C =Acquisition; D = Exercising; E = Apperception

SD=5.1) and management (M=14.1, SD=5.6) preferred Discovery. Administrative outpatient staff preferred the most Acquisition (M=12.6, SD=5.1). The learning style Acquisition and Discovery overlap with the focus on the body of knowledge of what needs to be taught.

The least preferred learning style for medics (M=7.0, SD=6.5) and support staff (M=5.2, SD=5.5) was Exercising and for nurses (M=8.9, SD=5.0) and administrative outpatient staff (M=8.7, SD=4.6) Apperception. This is a noteworthy result, because Apperception and Exercising are learning styles which build on the experience of the ‘teacher’.

### 5.3.3 Studied QICs and learning styles

In this paragraph we present the findings of the action research data on how the match between the learning approach of the QIC educational components and participants’ learning style preference influenced the learning processes. We describe the educational component of the QICs and which learning style approaches were used (presented between brackets). We also describe how the participants experienced the QIC educational components.

The two logistics QICs studied have a similar set up to most QICs using the Breakthrough Approach <sup>[5,11,12]</sup>. The project teams of different hospitals work on specific topics and well defined goals, derived from scientific and research based knowledge (e.g. clinical guidelines). A faculty of clinical professionals who are experts on the subject and experts in quality improvement methods supports

the project teams. The extensive use of multiple small test improvement cycles accompanied by measuring achievements and reflection on actions is the main improvement approach <sup>[10,66,67]</sup>. The most important QIC educational components for both QICs were:

- Four national conferences for all project team members of the QICs, where guidance and instruction was provided by experts. Half-day learning sessions, for project leaders and advisers, organised on a quarterly basis, where results were presented (sometimes by benchmarking) and successes and barriers were discussed.
- One hospital site visit by the QIC faculty, to exchange ideas and reflect on the lessons learned within each hospital.
- List-serv, an online tool only assessable for the participants, to store written information and send secured e-mail <sup>[68]</sup>.

In addition, a leadership network conference for all CEOs and leading consultant clinicians from each hospital was organized. The aim of this conference was to transfer information about logistics improvement and change management approaches and to explain the importance of their supporting role.

#### **Four national conferences for each QIC:**

The national conferences consisted of different elements: plenary lectures, time for the teams to work on their projects and cross-team learning activities such as exchanging experiences and ideas <sup>[11-12]</sup>.

During the first two national conferences almost all team members attended. Both conferences for both QICs had the same set up: five lectures were given to explain what the teams should do (Acquisition). Next to that, a physician who had already successfully conducted the improvement project relayed his experience in the form of a narrative (Apperception). After the first national conference the team members stated that they had a clear view as how to start their project.

*“We need to start by defining a goal and start assessing the current situation in the next week. We need to discuss the indicators and involve B. [employee of the financial department, responsible for extraction of data].” (administrative outpatient staff hospital B, Advanced Access QIC)*

The project team members felt they had acquired enough knowledge (Acquisition). However, after the second national conference different team members expressed some disappointment. They again expected a clear set of instructions

(Acquisition), but felt they did not receive that. At that point the multiple small test improvement cycles (Plan-Do-Study-Act) to experiment were starting, and they expressed not feeling sufficiently confident to proceed.

*“Without clear ‘homework’ about how to proceed we feel lost. Please can you help us and give some directions, otherwise we will lose so much time trying to find our way.” (manager hospital C, Process Redesign QIC)*

The team members explained that they did not have problems with understanding the principles of performing small test improvement cycle experiments, but with the change management aspect of this job. The experiments require their having to involve their co-workers, teaching and motivating them. Therefore they need to organise meetings to share insights and solve problems collectively (Participation). However they had little or no experience with this and needed guidance on how to interact with their colleagues

During the third and fourth conferences the number of team members attending declined. Particularly medics and management skipped these meetings. The reason for this, they expressed, was that they could not learn anything new at the meetings. The benefits gained were too few compared to the time and effort spent:

*“The shared information is identical and the QIC faculty cannot offer any solutions to the current issues I face in my outpatient clinic. We have to do this on our own and I do not expect them to have the magic key with all the answers.... The nurse will go and she can share relevant new information in the project meeting.” (physician hospital C, Advanced Access QIC)*

This quote highlights the fact that team members felt that the educational components of the second conference and the programme of upcoming conference (mainly Apperception and little Acquisition) no longer matched their preferred learning style (Discovery and Participation).

The third and fourth conference started with an open space session in which everyone could view posters displaying the results achieved by each team (Apperception). After this, lectures by the faculty on the next step in the project were held (Acquisition) and a narrative talk by an experienced expert medic was given (Apperception). We observed that some teams continued working on their projects instead of attending these lectures in the conference room.

*“We already know what they will talk about; there is nothing new to learn.” (physician hospital A, Advanced Access QIC)*

*“We have too much work and we need to make progress, so we prefer to use this time on our project.” (nurse hospital D, Process Redesign QIC)*

The first quote illustrates how the Acquisition learning style fails to match participants' preferences. Team members were looking for new knowledge but didn't find the lectures or talk interesting enough. Some team members pointed out that the subject of the lectures didn't relate to the problems they were facing at that moment.

### **Quarterly half -day learning sessions and faculty site visits**

Four half-day learning sessions were organised specifically for project leaders (mostly physicians) and support staff (e.g. advisers). In these sessions a substantial amount of time was spent on the results of the projects based on the indicator measurements (learning style Acquisition). Research on QICs shows that motivation is aligned with being able to observe concrete positive results arising from the improvement work <sup>[4,14]</sup>. With this in mind, the achievements of each project compared to the national set goals were shown. However, the project leaders stated that, despite the importance of the national goals (because QICs are funded by the government), these goals are not always considered important by the project team members. Rather, teams adapted these goals to fit their local context, whereby team members took into account what was feasible and desirable (Participation). This resulted in difficulties in the standardized gathering of objective and comparable information about all the QIC projects (Acquisition), and benchmarking therefore became challenging (Apperception).

During site visits the formal national set indicators were the focal point and a central theme in the communication between the QIC faculty and the board of the hospitals. If a team was not making substantial improvements based on the main indicator within the prescribed timeframe, some faculty members deemed the project a failure. In contrast, most project team members felt they had done an excellent job and had made great improvements, even if the data did not suggest this. Consequently, CEOs expressed their disappointment about the gap between presented data and local experience. They felt that the data could be more suitably used in a dialogue about figures and ratings (Participation) rather than as a form of evaluation. A dialogue between project team leaders, hospital management and QIC faculty (Participation) would provide the opportunity to share reasons why the teams had not reached the national set goals.

*“Let’s give you an example: The team managed to decrease the throughput time for diagnosis for patients with suspected colon cancer from one week to one day. By achieving this goal, we [the hospital] received an increasing number of referrals from nearby hospitals. Consequently our throughput time actually rose... It is a shame that this project is now seen as a failure.” (CEO hospital B)*

We noticed that this particular team was in the process of creating new knowledge about how to deal with an increasing flow of patients (Discovery). They were willing to share this knowledge (Apperception), but because of the faculties’ rigid framework they felt not encouraged to do so.

### **List-serv**

The List-serv is an online tool for the storage of documents and supports interaction between the QIC participants [68]. The QIC faculty used the List-serv to disseminate programme documents and progress reports. The List-serv was introduced as a communication channel to encourage participants to exchange ideas (Apperception and Participation) and to provide tools (Acquisition). Also, the List-serv had a chat function to steer sessions in discussing problems and solutions (Participation). Surprisingly, in practice the List-serve was only used by the teams as an archive for documents.

*“I don’t know the people at the other end of the line, and therefore I don’t want to ask for help” (outpatient nurse hospital C, advanced access QIC).*

### **QICs in general**

The QICs programme leaders described the aim of the QICs from a learning perspective in three ways. The first aim concerns the transfer of knowledge about the goal and change package of the QIC (Acquisition). The second aim is to encourage the mutual exchange of experiences and with that, the diffusion and dissemination of information throughout the QIC teams (Acquisition). The third aim involves the formation of a learning network, in which participants both contribute and receive information (Participation). The QIC faculty expressed that these three aims were not so easy to achieve, because the QIC participants did not form a homogeneous group; the project team members differed in profession, work experience and experience of improvement projects. This led to difficulties in finding a good balance in the level of knowledge offered. Some of the project team members felt they could not gain enough new knowledge (Acquisition), especially during the national conferences and by using the List-serv. As a result a substantial group of participants no longer attended the national conferences

and did not use the List-serv as a tool to share information. Unfortunately, their absence further decreased the potential to make considerable contributions to the knowledge transition (Acquisition) and new knowledge development (Discovery). An important element of the improvement methodology in QICs used to change daily practice is the multiple small test improvement cycle experiments methodology. These experiments fit very well with the most preferred learning style, Discovery: just jump in, have a go and try something new! However, we noticed that teams were slightly reluctant in starting to experiment, but were more engaged in an implementation approach. The written change package and the lectures were very clear with concrete steps or activities that will contribute to the improvement (Acquisition). For instance, the ten principles of Advanced Access or the five steps to reduce the throughput time.

*“We hesitate to start small rapid cycle experiments, and by this learning how to improve. I cannot convince them to work on both the short term based on the required goals, and the longer term improvement of their competence for improvement work” (adviser hospital D, process redesign QIC)*

## 5.4 Discussion

The first part of our study focused on the question: Does the learning approach of the QIC match the dominant learning style preferences of the participants? The **learning style survey** showed that the most preferred learning styles were Discovery and Participation. Only slight differences between participants based on age, gender, professional background and project role were found. Specifically, the preferred learning style of administrative outpatient staff and participants younger than 50 years old was identified as Acquisition. Discovery and Participation learning style require learning environments in which giving meaning and sense-making by reflecting on one’s own experiences are important. These findings correspond with other studies on learning in relationship with improvement work. Scott<sup>[69]</sup> found similar results in his systematic review about the effectiveness of improvement strategies. One of the most effective quality improvement strategies is professional education in interactive small groups focussed on cases (over 10% absolute increase). Moreover, Minkman et al.<sup>[9 p.10]</sup> concluded in their research on a stroke QIC that Participation was important: “the possibility for exchanging ideas and results with other regions were motivating factors, which emphasized achieving results.” Our survey showed that the

learning styles Apperception and Exercising, both focussing on experience-based learning, were least preferred.

The second part of our study focused on the question: How does the match between the preferred learning styles and the QICs' learning approach affect the learning process of participants? We conclude that the way in which the QICs were organised **did not sufficiently suit the preferred learning styles Discovery and Participation**; in fact, the lesser preferred learning styles Acquisition and Apperception formed the QICs' central learning approaches. Our research showed what the QIC offered was perceived differently over the course of time. In the first meetings faculty lectures (Acquisition) and expert peers' narratives (Apperception) as learning approach were highly valued as an efficient way to gain sundry knowledge about the upcoming improvement work. However, later on the participants expressed a greater need for interaction with others and the opportunity for reflection on their situation, which are elements of the Participation and Discovery learning style <sup>[35,36]</sup>. The greatest concern among participants was whether the lecture themes could really be applied in their practice; they felt the content was not focussed on 'the real thing'.

In our theoretical framework our starting point was from the idea that people have different (preferred) learning styles <sup>[25-27]</sup>. Our findings confirm a common implicit notion of learning styles: learning will be less effective or at least modestly efficient if educational components do not fit the (preferred) learning style of the participant <sup>[26]</sup>. However, little evidence is available to support this argument <sup>[26]</sup>. To our knowledge, this research is one of the first to explore this assumption empirically in the context of quality improvement in healthcare.

Authors reflecting learning style family one, two and three believe that learning processes and learning style preferences are relatively stable (constitutionally based: cognitive structure and ability, personality type) <sup>[25-27]</sup>. Applying this perspective to our findings one could argue that a QIC might be more effective if the learning approach fits the preferred learning styles Discovery and Participation. Moreover, we wonder to what extent the absence of this match poses difficulties to the transfer of knowledge and skills. Perhaps realistic situations that reflect every-day practice, such as site visits and training on-the-job, would be more suitable learning approach for QICs, because they contribute to the learning style Discovery. In addition, peer to peer consultation about the most challenging and sensitive issues in improvement, and dialogues between experienced project leaders and/or leading consultant clinicians of successful projects and project team members, could be offered to strengthen Participation. We found some support for these ideas in the quantitative research of Gustafson et al. <sup>[43]</sup> on educational components of QICs that showed that interest circle calls yield

significantly better results than learning sessions. Furthermore, more peer to peer learning and networking was also seen as helpful in the research of Fremont et al. [40]. However, because this was not offered in the QIC studied we cannot be certain about this.

In contrast, authors reasoning from learning style families four and five [25-27] suggest that learning style preferences are also driven by context and content and can change over time [22,23]. The satisfaction of the participants with the Acquisition and Apperception educational approach at the beginning of the QIC and the dissatisfaction with these learning styles later on may also be explained by different influences of the content and context that the programme entailed. While some learning style-related behaviors may depend on the specific context in a team, still it is striking that many participants ceased participation in the QIC, especially if the educational components did not provide enough new insights in the eye of the participants. Gaining new insights is closely connected to the way people learn specific content and the context in which this is offered, and therefore the learning approaches of the QICs influence this.

Numerous reports about quality improvement curricula exist in the literature [70-72]. Yet, only a small number of articles describe the actual educational methodology of these curricula and what participants learned (knowledge and skills). Similarly, research on how this affects their improvement work is lacking [17,19,20]. At this stage unfortunately, we can not validate our findings with empirical research of others. We would strongly welcome further work on the interplay between the participants' learning styles, learning approaches in QICs' educational components and how a QIC can be geared to facilitate the improvement processes.

Next we consider some **limitations of the methods** used in our research. First, the learning style questionnaire utilized is not commonly used. Although it has been validated in previous research [35,36] there is not much evidence on the applicability of the model for this type of research. Also, the tendency to give socially desirable and acceptable answers in a self-assessment survey and the creation of answer tendencies is always a possibility. Nevertheless, we did obtain a strong data sample using a theory based validated questionnaire. Finally, we recognize that in our theoretical framework the main focus is on individual learning style preferences and the learning approach of educational components in QICs, less emphasis is given to collective learning processes and how the team level performance and learning may interact with content and/or context. Future research could extend the knowledge in this direction.

Second, action research performed by researchers who also have the role of hospital adviser could be considered problematic in terms of validity. Politics, dynamics, ethics and context issues which influence its emergent process are embedded in data collection based on action research methodology traditions [73].

Being aware of this, we used triangulation between observations in our research diary, written minutes about conversations and thick descriptions. The sense-making meetings were also an attempt to confirm the findings in a rigorous way [53,56]. Action research is by nature a cyclical process in which practice is influenced by research findings. This was not the case in our study, because we analysed our action research data and performed the learning style survey after the QIC was finished. We therefore invite other QICs to use the results of our clinical inquiry [60].

In both QICs and in action research the emphasis is on the development of organization through learning [4,52,58]. Both recognize the importance of building knowledge on what works within this specific context by engaging the 'study subjects' in research and empowering them [74]. Until now no research has been carried out on the relationships between expanding knowledge and skills and the results of a QIC in terms of improvement aims. We call for more research on learning approaches and educational components of QICs in order to gain more knowledge on how QICs contribute to improvement work in the longer term.

## **5.5 Conclusion**

QICs are used by various organizations seeking to improve healthcare. Despite the popularity of QICs, they are described as a 'black box' in terms of their effectiveness [75] and especially their contribution to the development of skills among healthcare professionals [17,76]. In this research we studied the preferred learning styles of participants using a learning style survey and concluded that the most preferred learning styles were Discovery and Participation. Only slight differences between participants based on age, gender, professional background and project role were found. The learning style Acquisition was modestly preferred and Apperception and Exercising the least preferred. However, the educational components of the QICs studied (national conferences, half-day learning sessions, faculty site visits and use of List-serv) mainly employed the learning approaches Acquisition and Apperception. With action research data we could elucidate the participants' perceptions of the learning approaches of the QIC educational components. Our evidence suggests that the participants' satisfaction with the educational approaches offered changed over time. Lectures provided by the QIC faculty (Acquisition of knowledge) and narratives from experienced peers (Apperception) generated enthusiasm and motivation to change in the beginning. Later on the QIC participants were less satisfied with the educational components offered; perhaps the more preferred learning

styles Participation and Discovery would be more suitable and conducive to true learning. The outcome of this study provides guidance for future organisers of QICs with regard to which learning approaches will most benefit the participants. In addition, if participants know their preferred learning style, they could be more aware of and responsible for their own learning path.

## Acknowledgements

The authors wish to thank Jolande Verhulst, Marije Stoffer, Marc Rouppe van der Voort, Roland Bal and Guus de Vries for their contribution to this study and/or article.

## References

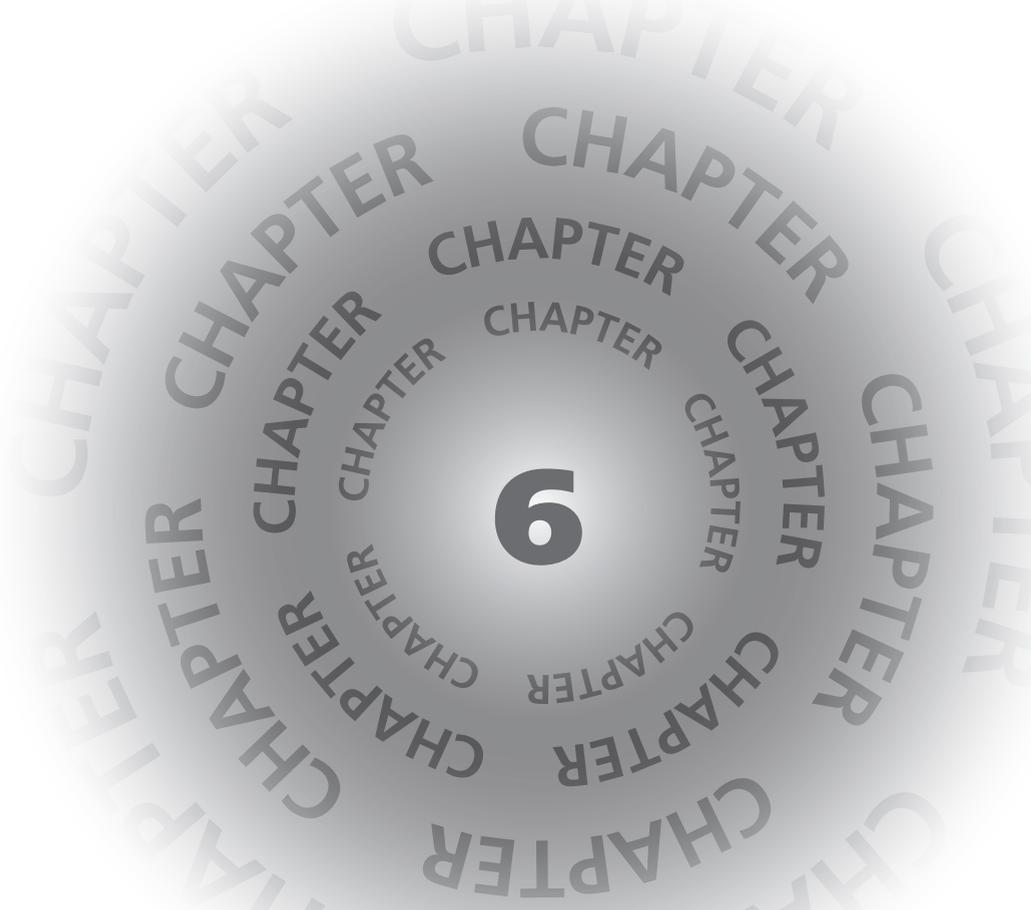
1. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Affairs* 2008;27 (3):759-769.
2. Davies H, Powell A, Ward V, et al.. Supporting NHS Scotland in Developing a new Knowledge into Action Model, 2011. [https://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/4002569/K2A\\_Evidence.pdf](https://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/4002569/K2A_Evidence.pdf) Accessed December 22, 2014.
3. NHS Healthcare Improvement Scotland: Getting Knowledge into Action to Improve Healthcare Quality: Report of Strategic Review and Recommendations, 2002. <http://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/4016980/20120805%20K2A%20short%20report%20for%20Board%20distribution%20v2%200.pdf> Accessed December 22, 2014.
4. Øvretveit J, Bate P, Cleary P, et al.. Quality Collaboratives: lessons from research. *Quality and Safety in Health Care* 2002;11:345-351.
5. Schouten LM, Hulscher ME, Everdingen JJV, et al.. Evidence for the impact of quality improvement collaboratives: systematic review. *BMJ* 2008;336 (7659):1491-1494.
6. Øvretveit J. How to run an effective improvement collaborative. *International Journal of Health Care Quality Assurance* 2002;15 (5):192-6.
7. Ayers LR, Beyea SC, Godfrey MM, et al.. Quality improvement learning collaboratives. *Quality Management in Healthcare* 2005;14 (4):234-247.
8. Nembhard IM. Learning and improving in quality improvement collaboratives: which collaborative features do participants value most? *Health services research* 2009;44 (2p1):359-378.
9. Minkman MMN, Schouten LMT, Huijsman R, et al.. Integrated care for patients with a stroke in the Netherlands: results and experiences from a national Break-through Collaborative Improvement project. *International journal of integrated care* 2005;5:1-12.

10. Wilson T, Berwick DM, Cleary PD. What Do Collaborative Improvement Projects Do? Experience from Seven Countries. *Joint Commission Journal on Quality and Patient Safety* 2003;2:85-93.
11. Kilo CMA. Framework for collaborative improvement: lessons from the Institute for Healthcare Improvement's Breakthrough Series. *Quality Management in Healthcare* 1998;6 (4):1-14.
12. Institute for Healthcare Improvement. The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston, 2003. <http://www.ihl.org/knowledge/Pages/IHIWhitePapers/TheBreakthroughSeriesIHI'sCollaborativeModelforAchievingBreakthroughImprovement.aspx> Accessed December 22, 2014.
13. Mittman BS. Creating Evidence Base for Quality Improvement Collaboratives. *Annals of Internal medicine* 2004;140:897-901.
14. Bate P, Rober G, McLeod H. Report on the 'Breakthrough' Collaborative approach to quality and service improvement within four regions of the NHS. University of Birmingham, 2002.
15. Schouten LM, Grol RP, Hulscher ME. Factors influencing success in quality-improvement collaboratives: development and psychometric testing of an instrument. *Implementation Science* 2010;5 (1):84.
16. Hulscher ME, Schouten LM, Grol RP, et al.. Determinants of success of quality improvement collaboratives: what does the literature show? *BMJ Quality & Safety* 2013;22 (1):19-31.
17. Nadeem E, Olin SS, Hill LC, et al. Understanding the components of quality improvement collaboratives: A systematic literature review. *Milbank Quarterly* 2013, 91.22:354-394.
18. Ogrinc G, West A, Eliassen M, et al.. Integrating practice-based learning and improvement into medical student learning: evaluating complex curricular innovations. *Teach Learn Med* 2007;19 (3):221-229.
19. Alexander JA, Hearld LR. What can we learn from quality improvement research? a critical review of research methods. *Medical Care Research and Review*, 2009.
20. Alexander JA, Hearld LR. The science of quality improvement implementation: developing capacity to make a difference. *Medical Care* 2011;49:S6-S20.
21. Pashler H, McDaniel M, Rohrer D, et al.. Learning styles concepts and evidence. *Psychological science in the public interest* 2008;9 (3):105-119.
22. Dunn RS, Dunn KJ. *The complete guide to the learning styles in service system*. Allyn and Bacon, 1999.
23. Keefe JW. Learning style: An overview. *Student learning styles: Diagnosing and prescribing programs* 1979;1:1-17.
24. The International Learning Styles Network [[www.learningstyles.net](http://www.learningstyles.net)].
25. Coffield F, Moseley D, Hall E, et al.. Learning styles and pedagogy in post-16 learning: A systematic and critical review, 2004.
26. Coffield F, Moseley D, Hall E, et al.. Should we be using learning styles?: What research has to say to practice, 2004.
27. Hall E, Moseley D. Is there a role for learning styles in personalised education and training? *International Journal of Lifelong Education* 2005;24 (2):243-255.

28. Myers IB, McCaulley MH, Quenk NL, et al.. The MBTI® manual: A guide to the development and use of the Myers-Briggs Type Indicator. Palo Alto, 1998.
29. Jackson C. Manual of the learning styles profiler. Sydney: Cymeon Research, 2002
30. Kolb DA. Learning styles inventory. The Power of the 2 2 Matrix, 2000:267.
31. Honey P, Mumford A. The learning styles helper's guide. Maidenhead UK, 2000.
32. McCarthy B. Using the 4MAT System to Bring Learning Styles to Schools. Educational Leadership 1990;48 (2):31-37.
33. Berings, MG, Poell RF, Simons PRJ. Conceptualizing on-the-job learning styles. Human Resource Development Review 2005;4 (4):373-400.
34. Berings M, Poell R, Gelissen J. On-the-job learning in the nursing profession: Developing and validating a classification of learning activities and learning themes. Personnel Review 2008;37 (4):442-459.
35. Simons P, Ruijters MC. Varieties of work related learning. International Journal of Educational Research 2008;47 (4):241-251.
36. Ruijters M. Liefde voor leren: over diversiteit van leren en ontwikkelen in en van organisaties. Deventer: Kluwer, 2006.
37. Murray P, Chapman R. From continuous improvement to organizational learning: developmental theory. The Learning Organization 2003;10 (5):272-282.
38. Hovlid E, Bukve O, Haug K, et al.. Sustainability of healthcare improvement: what can we learn from learning theory? BMC health services research 2012;12 (1):235.
39. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. Cochrane Database Syst Rev 2009;3.CD000072.
40. Fremont AM, Joyce G, Anaya HD, et al.. An HIV collaborative in the VHA: do advanced HIT and one-day sessions change the collaborative experience? Joint Commission Journal on Quality and Patient Safety 2006;32 (6):324-336.
41. Leape LL, Rogers G, Hanna D, et al.. Developing and implementing new safe practices: voluntary adoption through statewide collaboratives. Quality and Safety in Health Care 2006;15 (4):289-295.
42. Nembhard IM. Learning and improving in quality improvement collaboratives: which collaborative features do participants value most?. Health services research 2009;44 (2):359-378.
43. Gustafson DH, Quanbeck AR, Robinson JM, et al.. Which elements of improvement collaboratives are most effective? A cluster-randomized trial. Addiction 2013.
44. Murray M, Berwick DM. Advanced Access: Reducing Waiting and Delays in Primary Care. JAMA 2003;289 (8):1035-1040.
45. Hammer M, Champy J. Reengineering the Corporation: A Manifesto for Business Revolution. New York: Harper Business, 1993.
46. Coughlan P, Coughlan D. Action research for operations management. International journal of operations & production management 2002;22:220-240.
47. Pawson R, Tilley N. Realistic Evaluation. London, England: Sage Publications Ltd, 1997.
48. Reason P, Bradbury H. (Eds.). Handbook of action research: Participative inquiry and practice. London: SAGE Publications Limited, 2001.
49. Coughlan D, Brannick T. Doing action research in your own organization. London: SAGE Publications Limited, 2009.

50. Avison DE, Lau F, Myers MD, et al.. Action research. *Communications of the ACM* 1999;42 (1):94-97.
51. Argyris C. Teaching smart people how to learn. *Harvard business review* 1991;69 (3).
52. Berwick DM. The science of improvement. *JAMA: the journal of the American Medical Association* 2008;299 (10):1182-1184.
53. Winter R, Munn-Giddings C: *A handbook for action research in health and social care*. London: Routledge, 2001.
54. Waterman H, Marshall M, Noble J, et al. The role of action research in the investigation and diffusion of innovations in healthcare: the PRIDE project. *Qual Health Research* 2007;17:373–381.
55. Susman G, Evered R. An assessment of the scientific merits of action research. *Adm Science Quarterly* 1978;23:582–603.
56. DeWalt KM, DeWalt BR. *Participant observation: A guide for fieldworkers*. Rowman Altamira, 2010.
57. Westbrook R. Action research: a new paradigm for research in production and operations management. *International Journal of Operations and Production Management* 1995;15 (12): 6-20.
58. Middel R, Coghlan D, Coughlan P, et al.. Action research in collaborative improvement. *International Journal of Technology Management* 2006;33 (1):67-91.
59. Schein EH. *Proces Consultation: Lessons for managers and consultants*. Addison-Wesley serie on organizational development. Volume II. Massachusetts: Addison-Wesley Publishing Company, 1987.
60. Schein EH. *The clinical perspective in fieldwork*. Newbury Park: Sage Publications, 1987.
61. Shepherd M. Using a learning journal to improve professional practice: a journey of personal and professional self discovery. *Reflective Practice* 2006;7.3:333-348.
62. Weick KE. *Sensemaking in organizations*. London: SAGE Publications Incorporated, 1995.
63. Marsick VJ, O'Neil J. The many faces of action learning. *Management learning* 1999;30 (2):159-176.
64. Greenwood DJ, Levin M. *Introduction to Action Research*, London/Thousand Oaks: SAGE Publications, 2007.
65. Dutch Association of Hospitals [www.nvz.nl]
66. Langley GJ, Nolan KM, Nolan TW, et al.. *The improvement guide. A practical approach to enhancing organizational improvement*. San Francisco: Jossey-Bass Publishers, 1996.
67. Moen RD, NolanTW, Provost LP. *Quality improvement through planned experimentation*. New York: McGraw-Hill, 1999.
68. Lindgren H, Winnberg P. Evaluation of a semantic web application for collaborative knowledge building in the dementia domain. *Electronic Healthcare* 2012;p. 62-69.
69. Scott I. What are the most effective strategies for improving quality and safety of healthcare? *Internal medicine journal* 2009;39 (6):389-400.
70. Wong BM, Etchells EE, Kuper A, et al.. Teaching quality improvement and patient safety to trainees: a systematic review. *Academic Medicine* 2010;85 (9):1425-1439.

71. Kim CS, Lukela MP, Parekh VI, et al.. Teaching internal medicine residents quality improvement and patient safety: a lean thinking approach. *American Journal of Medical Quality* 2010;25 (3):211-217.
72. Wong BM, Levinson W, Shojania KG. Quality improvement in medical education: current state and future directions. *Medical education* 2012;46 (1):107-119.
73. Coghlan D, Shani A: Roles, politics, and ethics in action research design. *Syst Pract Action Research* 2005;18:533–46.
74. Meyer J. Action research. In: Gerrish K, Lacey A, eds: *The research process in nursing*. Oxford: Wiley-Blackwell, 2010:257–70.
75. Broer T, Nieboer AP, Bal RA. Opening the black box of quality improvement collaboratives: an Actor-Network theory approach. *BMC health services research* 2010;10 (1):265.
76. Sorensen AV, Bernard SL. Accelerating what works: Using qualitative research methods in developing a change package for a learning collaborative. *Joint Commission Journal on Quality and Patient Safety* 2012;38 (2):89-95.



# 9

## **The transfer of knowledge and skills in a Quality Improvement Collaborative focussed on improving patient logistics**

*Anne Marie Weggelaar-Jansen, Jeroen van Wijngaarden*



## 6.1 Introduction

Cost reduction by working more efficiently and effectively while improving quality of care has been on the healthcare agenda of almost every country in recent years <sup>[1]</sup>. Logistics improvement methods are widely used to achieve these goals. They aim to improve patient flows by applying supply and operational management concepts and tools <sup>[2,3]</sup>. Research has shown that achieving sustainable change is not easy to accomplish <sup>[4]</sup>. Teaching change methods to healthcare professionals to improve evidence-based clinical outcomes is a key success factor <sup>[5,6]</sup>. One commonly used method to educate healthcare professionals and improve healthcare simultaneously is a **quality improvement collaborative (QIC)** <sup>[7,8]</sup>. Øvretveit et al. <sup>[7 p. 345]</sup> define a QIC as “a collaborative [that] brings together groups of practitioners from different healthcare organizations to work in a structured way to improve a specific aspect of the quality of their service. It involves them in a series of meetings to learn about best practices in the chosen area, about quality methods and change topics and to share their experiences of making changes in their own local setting.” Despite their popularity in Europe, the United States, Canada, and Australia <sup>[8]</sup>, research shows mixed results on the effectiveness of QICs <sup>[9-18]</sup>. Most QICs try to achieve substantial improvements in the quality of care, logistics optimisation, increasing safe working routines and increased patient centeredness <sup>[11-15]</sup> by the implementation of best practices and /or the latest scientific insights (e.g. clinical guidelines) <sup>[12,13,16]</sup>. A systematic review <sup>[9]</sup> shows that evaluations of the effectiveness of QICs are scarce. To determine the degree of success, most studies focus on the results for quality improvement <sup>[17]</sup>, but not on the increase of skills of the participants <sup>[18]</sup>. No research had been done on increasing the knowledge and skills of QIC participants needed to improve and sustain these improvements. To improve the effectiveness of QICs, we studied what kind of knowledge and skills professionals need to accomplish logistics improvements in their hospitals and therefore need to be ‘taught’ in a QIC.

Research shows that an explicit focus on operation and supply chain management has a significant impact on hospital performance. Several studies reported increased quality of care and services, operational efficiency by reducing waste and costs and prevention of medical errors <sup>[3,19,20]</sup>. Logistics improvements focus on analysing and (re)designing the necessary steps to provide a service for a client <sup>[21]</sup>. Our research focussed on quality improvement of internal operational processes to provide care for patients; we refer to this as patient logistics.

Research shows that 98% of hospitals use multiple approaches to optimise patient logistics; 39% use five or more approaches <sup>[22]</sup>. Methods used in

healthcare include Six Sigma, Theory of Constraints, Lean, Business Process Reengineering, Just in Time, Critical Care Pathways, and Benchmarking (ibid). Despite using different approaches Van Lent et al. [22] state that only 49% of the hospitals accomplish their target efficiency goals. Other studies conclude that strong evidence of positive results is lacking [23-25]. Most of these studies do not have a rigorous design or consist of pre-post analysis in only one organization [22,23,25]. Publication bias is likely, since papers with negative results are scarce. This seems to suggest that at least half of the improvement efforts fail and we do not fully understand why. Since healthcare professionals are key in improvement work, we need to gain more understanding of the skills they need to improve patient logistics.

We used a mixed-methods approach to study two QICs focussed on improving patient logistics in hospital care. Our research question was: *How do QICs contribute to the transfer of knowledge and skills needed by healthcare professionals to sustainably improve patient logistics?*

## 6.2 Research methods

We used mixed methods (see Figure 1 for an overview) to answer the research question. 1. To identify which knowledge and skills participants need to improve patient logistics in their own practice, we performed a Delphi study. 2. We developed a questionnaire based on the Delphi study results and distributed it among the project team members participating in QICs. 3. We held two sense-making meetings for experts [26]. Our goal was to reflect on the findings and understand more about the context and underlying patterns [27].

### **Part 1: Data collection and analysis of the Delphi method**

We used a Delphi method with an iterative multi-stage process to convert single opinions into group consensus [28-30], starting with a group of six QIC leaders responsible for the learning sessions and for the support of all project teams. Based on their experience, each QIC leader provided a list of statements on knowledge and skills they felt were relevant for a team seeking to improve patient logistics. Subsequently, two researchers independently clustered the statements to develop a list, which a panel of independent experts commented on. All statements were reformulated into skills, because general context-independent knowledge can be covered by skills and can be explicitly taught [31,32]. After independently clustering and reformulating, we discussed their results. Based on the comments of the QIC

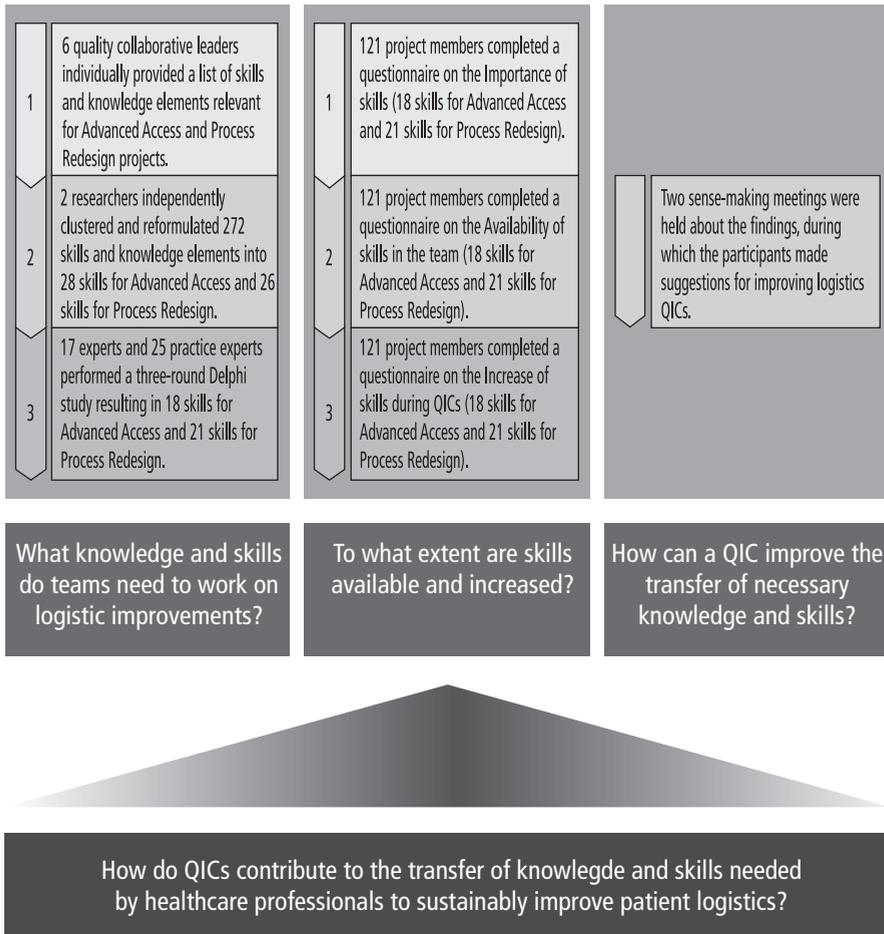


Figure 6.1 Research methodology

leaders, we created two lists. One list contained general skills needed for logistics improvement projects. The other list included skills specific to each of the two projects: Advanced Access and Process Redesign.

Several studies have concluded that the panel composition influences the rating [33,34] and suggest that heterogeneous decision-making groups lead to a better Delphi study than single-specialty panels [35-37]. Thus, we selected more respondents for the actual Delphi stages to include more expertise [38]. Seventeen respondents were chosen based on their expertise with logistics improvement projects, their multiple years of experience or previous research in the field. We found the experts by searching (inter)national publications, through national networks and conferences, active participation in the Dutch Faster Better QIC [29] and following other experts' suggestions. We also included 30 Dutch practice experts: project

leaders or project members (mostly hospital advisers) with experience in more than one logistics improvement project and regarded as experts in their hospital. All respondents were invited by e-mail and all 17 experts and 25 practice experts agreed to participate (100% and 83% response rate respectively). We reached the recommended panel size of at least 30 respondents <sup>[34]</sup>.

In the second stage of the **Delphi method**, we conducted three rounds of feedback. Since anonymity is crucial in the Delphi method <sup>[34]</sup> we e-mailed the list of skills using the blind carbon copy (BCC) address field which prevented participants discovering the identity of the other experts. In all rounds, the respondents were asked the same question: Which of the following skills do you consider important for performing a logistics improvement project? The respondents graded the skills based on a Likert scale ranging from one (not important) to 10 (most important), and were encouraged to provide additional comments, substantiate their grade, and suggest new skills or reformulate the skills.

We conducted a Fleiss kappa test <sup>[39,40]</sup> with 95% confidence interval to test the inter-rater reliability of the agreement of this categorisation; i.e. for each Delphi round we compared the number of respondents (42) times number of skills (18+23). We added a skill if the **Fleiss kappa test** resulted in 0.8 or more; between 0.5 and 0.8 we reformulated the skill, and below 0.5 we removed a skill. We processed the respondents' comments independently and discussed the suggestions based on consensus to present approved, new and reformulated statements (i.e. skills) for the next round. After three rounds, we reached consensus and all skills were above 0.8 on the Fleiss kappa test.

## **Part 2: Data collection and analysis of the questionnaires**

Based on the results of the Delphi study, we developed questionnaires for two logistics QICs: Advanced Access (reduce access time to the outpatient clinic <sup>[41]</sup>) and Process Redesign (reduce throughput time for patients by at least 20% <sup>[42]</sup>). All project team members (176: 96 in Advanced Access and 80 in Process Redesign) received the questionnaire at the final QIC meeting. Project team leaders were asked to distribute the questionnaire among those not present. The respondents were asked to score on a five-point Likert scale:

- How Important was each skill for their ability to improve their logistics processes (from very important 5 to neutral 3 to not 1).
- Was the skill Available in their team (highly available 5 to neutral 3 to not 1).
- Had these skills Increased by participating in the QIC or improvement project (very much increased 5 to neutral 3 to not 1).

The questionnaires were returned anonymously and the data was analysed with

SPSS 19.0. The sample characteristics were analysed using descriptive statistics. Statistical analyses of Importance, Availability in the team and Increase in skills during the QIC consisted of frequency counts and percentages for each QIC. All items were screened for univariate and bivariate normality and to detect outliers. No extreme values were found and only a few items (3%) had missing data. ANOVAs were performed on the whole dataset to examine if differences in professional background and role in the project led to different outcomes. A sum score was calculated for each scale. In connection to this the internal consistency was assessed by computing the Cronbach's  $\alpha$ . The internal consistency of each subscale was good (range 0.87 - 0.97). With the sum scores, bivariate correlations were calculated between Importance, Availability in the team and Increase in skills. The sum scores also served to compare Importance, Availability and Increase in skills between the two QICs with ANOVAs.

### **Part 3: Data collection and analysis of the sense-making meeting**

The third part of this research fits into the qualitative research paradigm. We organised two sense-making meetings <sup>[43-45]</sup> to understand more about the context of our findings. Pawson and Tilley <sup>[27]</sup> and Berwick <sup>[1]</sup> suggest using methods that go beyond the classic 'successionist' format that dominates the usual scientific toolkit of evidence-based medicine. They suggest using the alternative CMO model: context - mechanism = outcome, to gain more understanding of the reasons behind and consequences for the practice of improvement studies. Applying sense-making methodology meant we could address 'how' and 'why' questions about the QICs <sup>[45]</sup> and make sense of the complex relationships that underline healthcare improvement practice and influenced our findings <sup>[46]</sup>.

Two sense-making meetings on the Delphi and questionnaire findings were held with a professor in health logistics, three collaborative faculty members and one of the programme leaders. We asked the attendees to share their opinions, thoughts, beliefs and experiences. During the discussion, one researcher challenged each attendee to explicitly question and examine underlying perceptions and beliefs about the skills needed, transfer of skills in the QIC and the implications for logistic improvement work within the hospital. The ladder of inference was used to reveal the underlying perceptions and beliefs <sup>[47,48]</sup>. The ladder of inference maps how we move from observable data to selecting only data which we pay attention to, to attaching meaning, to making assumptions based on these meanings, to drawing conclusions which adopt beliefs and steer our actions, which in turn affects which data we choose to select from what we observe <sup>[47,49]</sup>. The aim of using the ladder of inference <sup>[50]</sup> was to help the participants of the meeting to:

- Become more aware of their thinking and reasoning (reflection).

- Make their thinking and reasoning more visible to others (advocacy).
- Understanding other participants' thinking and reasoning (inquiry).

This resulted in narratives which illuminates the attendees' experiences or beliefs (bottom step of the ladder of inference). As soon as consensus was reached about the problems the QIC faculty faces, the attendees were invited to come up with suggestions to improve logistics QICs in general or logistic projects. Attendees expressed what should be changed and why, up to a point of shared understanding and written on flip charts.

The meetings were audiotaped and transcribed. The transcription and flip charts used were analysed deductively (related to the research questions) and inductively (based on themes which emerged from the data). Next, the findings as presented in this paper were sent to five participants for member-checking purposes.

## 6.3 Findings

### 6.3.1 Delphi Study

In the Delphi study, we identified the skills required for improving patient logistics. All 42 participants had theoretical or practical expertise. See table 6.1 for characteristics of all the participants. The response rate in rounds one and two was 100%; two practice experts withdrew in round three (response 95.7%).

The first stage of the Delphi study resulted in 272 statements on relevant knowledge, competences and skills provided by the QIC faculty (100% response with a median of 47 statements, range 26-87 statements). We clustered and reformulated the statements into a list of 28 skills for Advanced Access and 26 skills for Process Redesign. Of the 28 skills, 14 skills were the same.

In the first round, nine skills were reformulated, eight were clustered, seven were omitted (classified as not important by scores below 0.5) and two new skills were added based on five suggestions. In the second round, three skills were reformulated and one of the new skills was clustered; the other new skill was scored above 0.8 thresholds. In the third round, only four minor reformulation changes were made. No new skills were added or omitted. The Delphi study resulted in a list of 18 skills for Advanced Access and 22 skills for Process Redesign. See table 6.2 for a list of the skills, the grey colouring shows similarities or differences in the required skills.

**Table 6.1** Characteristics of Delphi panel experts (N=42)

Characteristics	Category	Expert group
Gender	Male	12
	Female	30
Age	< 30 year	8
	30 – 40 years	14
	41 – 50 years	11
	51 – 65 years	9
Professional background	Advisers/policy makers	8 (2 are also researchers)
	Medics	8
	Nurses	6
	Management	3
	Outpatient clinical staff	7
	Applied healthcare staff	4
	Researchers	8 (2 are also advisers)
Years of experience with logistics improvement	< 2 years	6
	2-5 years	11
	6-10 years	15
	>10 years	10
Specialty (source of expertise)	Consultancy	6
	Project leader	8
	Research	8
	Research and consultancy	2
	Practice in projects	18

### 6.3.2 Survey

In the second phase, we examined the Importance, Availability and Increase in skills using two questionnaires based on the results of the Delphi study.

#### Respondents

Fifteen teams for Advanced Access and 11 teams for Process Redesign participated in the questionnaire survey and 121 of the 176 questionnaires were filled in (68.8% response): 70 for Advanced Access (72.9% response) and 51 for Process Redesign (63.8% response). Table 6.3 displays descriptive characteristics of the respondents. The respondents accurately reflect the proportion of types of hospital professionals involved in the QICs, and are representative for gender, age and roles in the project team. The group of respondents is divided into the major hospital profession groups: medics (e.g. physicians, fellows and residents), nurses (e.g. registered nurses, nursing students and nurse practitioners), allied healthcare professionals (e.g. ambulatory physicians, respiratory, physical and

**Table 6.2 Skills for Advanced Access and Process Redesign and the assessment of Importance, Availability in the team, and Increase in skills**

<b>Advanced Access</b>	Importance of skills	Availability of skills in the team	Increase in skills	<b>Process Redesign</b>	Importance of skills	Availability of skills in the team	Increase in skills
Analysing the current situation	M 4.4 SD 0.7	M 3.8 SD 0.9	M 3.8 SD 0.7	Analysing the current processes	M 4.6 SD 0.5	M 3.9 SD 0.7	M 3.7 SD 0.7
				Mapping out processes	M 4.5 SD 0.6	M 4.0 SD 0.7	M 3.8 SD 0.7
				Specifying shared objectives for the whole chain	M 4.4 SD 0.6	M 3.8 SD 0.7	M 3.8 SD 0.8
Seeing connections between the different activities of employees	M 4.5 SD 0.6	M 3.8 SD 0.8	M 3.9 SD 0.7	Seeing connections between the different steps in the process	M 4.5 SD 0.6	M 3.9 SD 0.7	M 3.7 SD 0.7
Identifying bottlenecks/problems	M 4.6 SD 0.5	M 4.1 SD 0.8	M 4.0 SD 0.7	Identifying bottlenecks/problems	M 4.5 SD 0.7	M 3.9 SD 0.9	M 3.5 SD 0.7
Identifying the causes of bottlenecks/problems	M 4.5 SD 0.6	M 3.7 SD 0.8	M 3.9 SD 0.7	Identifying the causes of bottlenecks/problems	M 4.4 SD 0.7	M 3.7 SD 0.7	M 3.6 SD 0.8
Generating solutions for bottlenecks/problems	M 4.5 SD 0.8	M 3.6 SD 0.7	M 3.8 SD 0.7	Generating solutions for bottlenecks/problems	M 4.4 SD 0.7	M 3.6 SD 0.9	M 3.7 SD 0.7
				Translation of best practices of others	M 4.1 SD 0.7	M 3.6 SD 0.8	M 3.6 SD 0.8
				Converting (evidence based) guidelines into standardized daily processes	M 4.1 SD 0.7	M 3.6 SD 0.8	M 3.5 SD 0.7

<b>Advanced Access</b>		<b>Process Redesign</b>	
Importance of skills	Availability of skills in the team	Importance of skills	Availability of skills in the team
Performing measurements	M 3.9 SD 0.7	M 4.1 SD 0.8	M 3.6 SD 0.9
Making evaluations based on measurements	M 4.3 SD 0.7	M 4.0 SD 0.6	M 3.6 SD 0.9
Devising solutions for bottlenecks/problems based on the Advanced Access principles	M 4.1 SD 0.9	M 3.8 SD 0.7	M 3.5 SD 0.8
Aligning supply and demand more effectively	M 4.3 SD 0.8	M 3.5 SD 0.9	M 3.5 SD 1.0
Keeping access times as short as possible for our outpatient clinic	M 4.3 SD 0.8	M 3.5 SD 1.0	M 3.5 SD 0.8
Having constructive meetings	M 4.2 SD 0.7	M 3.3 SD 0.9	M 3.5 SD 0.7
Engaging in constructive discussions with each other	M 4.3 SD 0.8	M 3.7 SD 1.0	M 3.7 SD 0.6
Jointly reaching decisions	M 4.3 SD 0.7	M 3.6 SD 0.9	M 3.7 SD 0.6
Making improvements via the rapid cycle method	M 4.2 SD 0.8	M 3.5 SD 0.9	M 3.4 SD 1.0
Performing measurements	M 3.9 SD 0.9	M 4.1 SD 1.0	M 3.6 SD 0.9
Making evaluations based on measurements	M 4.2 SD 0.7	M 4.0 SD 0.6	M 3.6 SD 0.9
Applying the process redesign principles when redesigning a process	M 3.9 SD 0.8	M 3.8 SD 0.7	M 3.5 SD 0.8
Reducing the turnaround time as much as feasibly possible in our hospital	M 4.1 SD 0.9	M 3.5 SD 0.9	M 3.5 SD 1.0
Reducing the total hospitalisation time as much as feasibly possible in our hospital	M 3.9 SD 0.9	M 3.5 SD 1.0	M 3.5 SD 0.8
Having constructive meetings	M 3.9 SD 0.9	M 3.3 SD 0.9	M 3.5 SD 0.7
Engaging in constructive discussions with each other	M 4.0 SD 0.9	M 3.7 SD 1.0	M 3.7 SD 0.6
Jointly reaching decisions	M 4.1 SD 0.9	M 3.6 SD 0.9	M 3.7 SD 0.6
Making improvements via the rapid cycle method	M 4.1 SD 0.7	M 3.4 SD 0.9	M 3.4 SD 0.9

<b>Advanced Access</b>	<b>Process Redesign</b>				
Importance of skills	Availability of skills in the team	Increase in skills	Importance of skills	Availability of skills in the team	Increase in skills
Establishing whether changes lead to actual improvement	M 4.5 SD 0.6	M 3.5 SD 0.8	M 3.6 SD 0.7	M 4.3 SD 0.7	M 3.4 SD 0.7
Transferring knowledge and skills to other colleagues at the outpatient clinic	M 4.5 SD 0.7	M 3.3 SD 0.9	M 3.3 SD 0.9	M 4.2 SD 0.8	M 3.5 SD 0.7
Motivating colleagues at the outpatient clinic to change	M 4.5 SD 0.6	M 3.1 SD 1.0	M 3.3 SD 0.9	M 4.4 SD 0.7	M 3.5 SD 0.7
Implementing changes at the outpatient clinic	M 4.6 SD 0.6	M 3.4 SD 0.9	M 3.6 SD 1.0	M 4.4 SD 0.7	M 3.6 SD 0.9

Legend: M = Mean; SD = Standard Deviation;  
 White = exactly the same wording; Light grey = slight modifications in sentence; Grey = different skills; Dark grey = additional skills

occupational therapists, dieticians and pharmacists), administrative employees to support care planning, management and other supportive staff (e.g. advisers and policy makers).

### **Importance of skills**

The respondents regarded most skills as important and scored them above four on the five-point Likert scale (mean between 4.0 and 4.6 for Advanced Access and 3.9 and 4.7 for Process Redesign). The respondents felt the analytical skills required for improvement were most important. Surprisingly, the skills connected to the aim of the QIC were assessed as moderately important, namely, for Process Redesign, reducing both total hospitalisation time and turnaround time. The skill of devising solutions for bottlenecks/problems based on the Advanced Access principles. For more information, see table 6.2, Importance column.

To explore differences in the assessment of importance in skills by project role and by professional background, we performed one-way ANOVAs. A modest statistically significant difference was found between the project leader and project team member regarding the importance of skills for Process Redesign ( $F(2,45)=2.57$ ,  $p=0.09$ ). Team members (M 80.6, SD 6.0) seem to score skills as more important than project leaders (M 65.8, SD 7.6). No significant differences were seen depending on the professional background ( $F(3,46)=1.36$ ,  $p=0.27$ ). The skills related to measurements were seen as least important.

### **Availability of skills in the project team**

The respondents assessed the Availability of skills in their project team much lower than the Importance of the skills (Table 6.2, columns Importance and Availability).

For both QICs, the respondents felt that the skills related to change management were most lacking. In contrast, analytical skills were seen as more available in the team.

No statistically significant differences were found in Availability of skills for project role ( $F(2,44)=0.18$ ,  $p=0.83$ ) and profession ( $F(3,45)=1.26$ ,  $p=0.30$ ) based on one-way ANOVAs ( $p < 0.5$ ). Nevertheless, it is striking that project team members assessed the team as less skilled than the project leaders did in the overall rating. The skill of making improvements via the rapid cycle method in Process Redesign showed the biggest difference. Project leaders assessed this skill as M 3.9 (SD 0.7) and project team members as M 3.2 (SD 0.5).

### **Increase in skills**

Overall, the assessment of the degree of Increase in skills during the QIC was lower in Process Redesign (M between 3.2 and 3.8) than in Advanced Access (M between 3.6 and 4.3). See table 6.2, Increase. The skills related to engaging

other colleagues showed the least increase for both QICs; i.e. motivating colleagues for Advanced Access and actively involving key persons and main stakeholders in the process of change for Process Redesign and transferring knowledge and skills to colleagues. The increase in analytical skills (e.g. the ability to perform measurements) was assessed differently for both QICs; for Process Redesign M 3.5 (SD 1.0) and for Advanced Access M 4.1 (SD 0.8). The change management skills directly necessary for Advanced Access were only acquired to a small degree: motivating colleagues and transfer of knowledge and skills to other colleagues. The skills directly connected to the aim of the Process Redesign QIC were acquired to an even lesser extent: reducing hospitalisation time and reducing turnaround time as much as feasibly possible in our hospital. See table

**Table 6.3** Characteristics of questionnaire respondents

	Advanced Access		Process Redesign	
	N = 70	Percentage	N = 51	Percentage
<b>Gender</b>				
Male	16	22.9%	22	43.1%
Female	54	77.1%	29	56.9%
<b>Age</b>				
< 30 years	10	14.3%	5	9.8%
31 to 40 years	15	21.4%	18	35.3%
41 to 50 years	35	50.0%	18	35.3%
> 50 years	10	14.3%	10	19.6%
<b>Project team role</b>				
support staff	12	17.1%	10	19.6%
project team member	40	57.1%	25	49.0%
project leader	14	20.0%	11	21.6%
Other	4	5.7%	3	5.9%
Absent			2	3.9%
<b>Professional background</b>				
management	22	31.4%	12	23.5%
administrative employees	14	20.0%	1	2.0%
supporting staff	12	17.1%	13	25.5%
allied healthcare staff	8	11.4%	0	0.0%
Nursing	5	7.2%	8	15.7%
Medic	5	7.2%	15	29.4%
Other	4	5.7%	2	3.9%

**Table 6.4** Correlation between Importance, Availability and Increase in skills

	Importance	Availability	Increase
<b>Advanced Access (N=70)</b>			
Increase		r = 0.35 p < 0.01	r = 0.31 p = 0.01
Availability	r = 0.35 p = 0.04		r = 0.801 p < 0.0001
<b>Process Redesign (N=51)</b>			
Increase		r = 0.29 p = 0.04	r = 0.35 p = 0.02
Availability	r = 0.29 p = 0.04		r = 0.61 p < 0.001

6.2; Increase, for more information.

ANOVAs revealed no significant effect on the assessment of increase on skills at the  $p < 0.5$  level for the project role ( $F(2,39)=0.35$  and  $p =0.71$ ) and professional background ( $F(3,40)=0.68$  and  $p =0.58$ ). Project leaders rated the skill of having constructive meetings as little increased. Possibly they felt that they already possessed this skill, but that their project team members needed to develop it. For detailed information, see table 6.3, Increase by profession and project role.

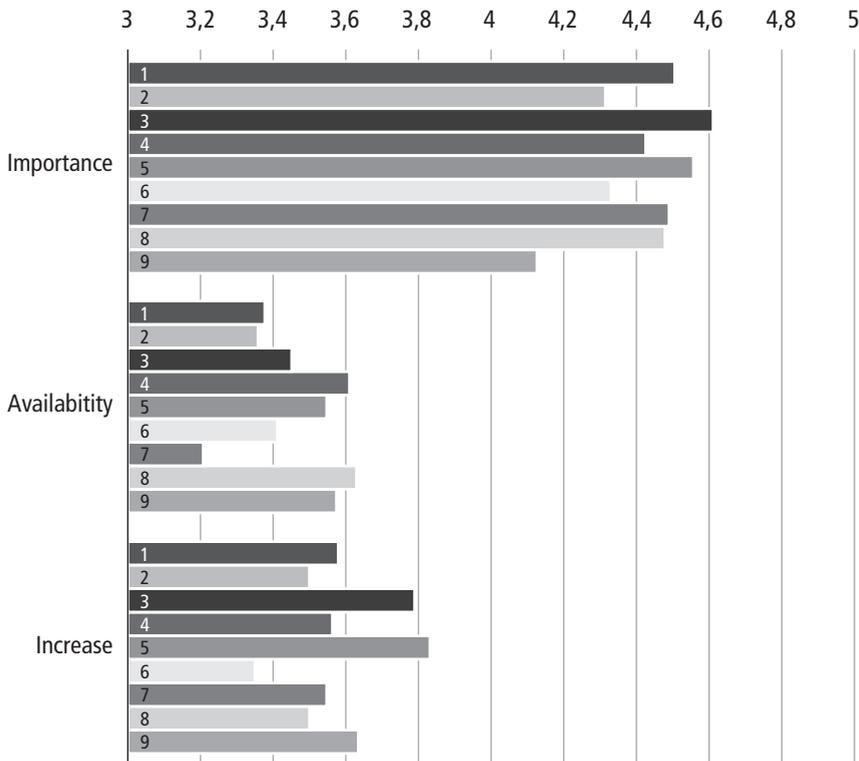
**Combination of Importance, Availability and Increase in skills**

In summary, we have shown that a logistics QIC resulted – in the opinion of respondents – partly in an increase in the participants’ skills in all areas required for logistics improvement. Bivariate correlations were computed to assess the relationship between the Importance, Availability and Increase sum scores. In both QICs, all correlation coefficients were positive and moderate in terms of strength, ranging from 0.29 to 0.35. In contrast, both QICs showed an exceptionally strong association between Availability and Increase in skills: for Advanced Access  $r = 0.80$ , and for Process Redesign,  $r = 0.61$ .

Pearson product-moment correlation coefficients were computed to assess the relationship between Importance, Availability and Increase for both QICs. For all three topics there is a strong significant correlation (see table 6.4).

**6.3.3 Sense-making meetings**

Two sense-making meetings were held around the findings of the Delphi and questionnaire study. The findings are presented around four key problems the attendees expressed.



**Figure 6.2** Change management skills considered Important, skills Available in project team and Increase in skills during QIC.

Legend:

- 1 – AA: Transferring knowledge and skills to other colleagues at the outpatient clinic
- 2 – PR: Transferring knowledge and skills to other colleagues involved in the process
- 3 – AA: Implementing changes at the outpatient clinic
- 4 – PR: Turning decisions into actions to change
- 5 – AA: Establishing whether changes lead to actual improvement
- 6 – PR: Establishing whether changes lead to actual improvement
- 7 – AA: Motivating colleagues at the outpatient clinic
- 8 – PR: Actively involving key persons and main stakeholders in the processes of change
- 9 – PR: Translation of best practices of others

**Problem 1: No project and change management skills**

The results of the Delphi method showed that not only skills for identifying logistics problems and finding solutions for these problems are important, but also project and change management skills. Despite their importance, both Availability (M ranging from 3.2 to 3.8) and Increase in these skills were rated low (M ranging from 3.4 to 3.8). See Figure 6.2 for an overview of scores for change management skills.

The attendees expressed that change management and project management

skills are hard to teach. These skills can be seen as personal competences developed over time. Knowledge in this area is not just 'know-how', but also 'know-why' and 'knowing-how-to'. 'Know-how' was shared in the QICs with lectures and written packages that explained technical models for change and improvement. 'Know-why' and 'know-how-to' were gained by understanding the interactions between people. The attendees questioned whether every medic and nurse needed training to become highly skilled in project and change management. They should understand the basics, but in their view it is more efficient to select the right mix of project members, ensuring that project and change management skills are available to the team.

**Problem 2: Knowledge should be transferred to the whole system.**

According to attendees, not just project team members should gain more knowledge and develop skills, but all hospital employees involved. Therefore, it is essential that the knowledge gained spreads, to reach other health-care employees in the hospital. Attendees felt that the engagement of other employees is essential at several stages in an improvement project, but especially in the rapid cycle experiment improvements. The rapid cycle experiments have blurred boundaries between the project work and the daily routine. Hence, it is important that every employee understand the aim, the experiment, the measures and so forth. Team members should share knowledge with other employees in every phase of the project. However, the survey showed that respondents felt only modestly capable of involving key persons/main stakeholders in transferring knowledge and skills to other colleagues. Therefore the attendees suggest that QICs should pay more attention to developing knowledge-brokering skills so that participants can mediate between groups of healthcare professionals. They need to be able to share knowledge that fits with the various perspectives and languages of the different stakeholders.

**Problem 3: The principles listed in the change package did not fit the problems faced.**

Participants in the logistic QICs assessed the increase of their skills during the QIC as very modest. Attendees of the sense-making meetings observed that what is taught at QIC meetings and what is explained in the written change package does not always fit the expectations of participants. During the QIC 'bite-sized chunks' were used to transfer information, e.g., eight principles of Advanced Access, and eight principles embedded in seven steps for Process Redesign. This knowledge helped the project teams to get started but they soon needed to adjust these principles to make them fit their hospital setting and context. Most teams lacked the skills to do this and, as the survey showed, these increased only modestly (see Table 5).

**Table 6.5** Availability/Increase in skills needed to adjust daily practice to reach goals

Advanced Access	Redesign Process				
	Available	Increase		Available	Increase
Aligning supply and demand more effectively	M 3.5 SD 0.8	M 3.5 SD 0.9	Reducing the turn-around time as much as feasibly possible in our hospital	M 3.5 SD 1.0	M 3.3 SD 1.0
Keeping access times as short as possible for our outpatient clinic	M 3.5 SD 1.0	M 3.5 SD 1.0	Reducing total hospitalisation time as much as feasibly possible in our hospital	M 3.5 SD 0.8	M 3.2 SD 0.9

The attendees of the sense-making meetings suggested using an approach more centred on team learning. This approach focusses on what team members want to learn, rather than on what the faculty thinks they should teach. The assumption is that participants, as learners, differ in their motivation, needs, interests and the skills they wish/need to develop. In addition, their context differs and this requires teaching participants to use the right 'principles' for the problems they face. A team-learning-centred approach challenges the QIC faculty to understand more what a team wants to do with the transferred knowledge and gained skills in their own organization.

**Problem 4: Overemphasis on project goals instead of on continuous improvement.**

The attendees argued that the QICs focussed too much on reaching project targets and too little on developing ongoing improvement skills. QIC participants should not only be equipped to set up a logistics pathway/chain for one disease or decrease in access times. Rather, they should be able to deal with an array of logistical challenges, also in future situations. Surprisingly, as table 6.5 shows, Increase in the skills connected to the primary aim of the QICs scored very low. The attendees suggested that participants need to learn the basic principles of coordination of logistics services. Developing skills to coordinate logistic services can best be fostered by giving attention to inter-project learning. This concerns translating knowledge and experiences from one project to another or to similar problems or situations. During the QIC, participants should be helped to share what they learn more explicitly with others, using reflexive methods in knowledge creation. Examples given by the attendees to support this process include asking project teams to write a review and discuss this with other teams, organising reflective meetings in hospitals where lessons learned are shared, or organising brainstorming meetings to discuss (potential) problems and come up with ways to ensure success and avoid problems.

## 6.4 Discussion

In the first part of this research we examined **what knowledge and skills needs to be available** in teams participating in a QIC aiming to improve patient logistics. Our Delphi study identified 15 skills relevant to both QICs and specific skills for each QIC. These can be divided in skills particular to improving patient logistics (main goal of the QIC), project management and change management. The respondents agreed with the Delphi experts and rated all the skills as important. Due to the lack of healthcare sector-related studies, we compared our findings with more general literature on skills needed for logistical improvement. Our findings show similarities with the results of the Gammelgaard and Larson<sup>[31]</sup>, who performed a literature review combined with a survey to identify universal logistic management skills. They distinguish four categories of skills for logistic managers: people skills, analytical skills, technical logistics knowledge and management skills. The project management skills (e.g. meeting facilitation) are also seen as most important by Le May et al.<sup>[51]</sup> and Thai<sup>[52]</sup>, who both studied the training needs of supply chain managers. Prajogo and Sohal<sup>[53]</sup> found in their survey of logistical managers that communication and teamwork are identified as the most important competences. Technical knowledge on logistics improvement methods are seen as essential, but has no significant impact on daily practice improvement work (ibid). In contrast, Prajogo and Sohal<sup>[53]</sup> conclude that environmental issues related to the management of resources have a significant impact.

More research is needed to understand the specific skills used to achieve logistics improvements in healthcare practice. Without doubt one of the main challenges for further research is to understand more of the roles healthcare professionals can play in this work.

In the second part we focussed on the question: To what extent are these **skills available in the team and increased** according to the QIC participants? Our research shows that the participants of both QICs rated most skills modestly available in teams and rated the skills related to change management as most lacking. In contrast, the skills to analyse logistical problems were seen as far more available in the team. Both QICs rated the increase in skills as very modest. The skills related to engaging other colleagues showed the least increase in both QICs while analytical skills increased the most.

Numerous studies have shown that improving (logistic) healthcare is a skill-based activity that is best performed by professionals<sup>[54-57]</sup>. Vinci et al.<sup>[58]</sup> used self-assessment to reveal the connection between a quality improvement course for internal medicine residents and increased skills. They found more gain in

solid knowledge (e.g. write a clear aim, apply best professional knowledge and use measurements) rather than in skills for working on the next improvement challenge. However, no study to date has demonstrated that involvement in a QIC adds to knowledge or improves skills in logistic improvement techniques, change and project management <sup>[59-60]</sup>.

The third part of our research examined **if a QIC can foster improvement** of patient logistics by contributing to the **transfer of skills among participants**. The aims of the sense-making meetings were to contextualise our findings <sup>[61,62]</sup>, gather narrative data explaining the quantitative results, and identify practical implications for QICs <sup>[63]</sup>. The attendees of the sense-making meetings identified four key problems concerning the development of skills in QICs and how these influence the sustainability of improvement work in healthcare organizations. The attendees suggested that more emphasis should be given to skills to transfer knowledge to colleagues, adjust the taught principles to their own situation and inter-project translation of knowledge. Numerous research showed that the key element in continuous improvement work is developing professionals to work on improving daily practice <sup>[12,64,65]</sup>. Pronovost states: "Many quality improvement projects often fail to achieve their goals... An even larger number of projects fail because of adaptive challenges. Adaptive challenges can only be addressed through changes in people's priorities, beliefs, habits and loyalties" <sup>[66 p. 560]</sup>. The attendees suggested by tapping more into the needs of participants and fostering intra-project learning more implicit knowledge can be 'harvested' and therefore shared with others. They suggested more attention could be given in QICs to what went well and what should be done differently in future improvement projects.

The primary aim of a QIC is to educate participants to make changes in their own healthcare organization <sup>[9-11]</sup>. The attendees argued that if QICs focus on the educational needs of individual participants, they will also be able to deal with future logistics problems, leading to more sustainable improvements. To understand more about the effectiveness of learning processes in QICs, more research is needed. We suggest more research into the way the knowledge and skills are transferred in the QIC. In a systematic review, Nadeem et al. <sup>[60]</sup> studied the connection between the educational components of QICs (e.g. phone meetings, collaborative extranet, site visits, learning session and training) and achieved goals on both the provider level and patient level. They conclude that it is impossible to identify effective QIC components, because the reporting is imprecise. Most articles only report objective results of the improvement work based on the aim of the QIC and not on the increase of skills. Research could focus on how learning styles are met in different aspects of QIC programmes. In

addition, empirical studies with more data are required to confirm the insights of the sense-making meetings to generalise our findings and help in the transition from building the theory to testing it.

## **6.5 Limitations of the research**

### **6.5.1 Delphi**

Since the introduction of the Delphi study in 1962, there has been no consensus on how to perform it <sup>[29,67]</sup>. There is also considerable academic debate on the value of group consensus <sup>[68]</sup>. We tried to increase the validity and credibility of our Delphi study by following the strict protocol developed by Boulkedid et al. <sup>[35]</sup> and Okoli et al. <sup>[69]</sup>. However, as always in a Delphi study, the quality of respondent determines the outcome. Therefore we selected a wide range of respondents with different relevant experiences. This increased the likelihood that the resulting list of skills will be relevant across multiple contexts and settings. That most statements (i.e. skills) in the questionnaire were rated important by the participants of the QIC confirmed the validity of our exploratory study.

### **6.5.2 Survey**

Several limitations can be observed in this evaluation study. First, the questionnaire did not undergo formal psychometric testing, only Cronbach's alpha was calculated. Furthermore, every item scored highly in all three questionnaires (between 3.6 and 4.9): the distinction within a five-point Likert scale can be considered as too low (too few subdivisions). Hence, for future research we recommend using a ten-point Likert scale. Next, our survey data is based solely on self-assessment in the questionnaire. This creates a possible tendency towards socially desirable answers. It is important to point out that besides the survey results we collected limited additional data (only project role and profession). This made it difficult to control for coexisting factors independent of the logistics QIC. Due to the nature of improvement work, the outcome (i.e. increase of skills) can be affected by activities both before and during the QIC.

### 6.5.3 Sense-making meetings

The sense-making meetings had limitations. First, we organised only two sense-making meetings with a small group of participants. However, the participants are considered by the Dutch healthcare system as experts in both logistics and QICs, and there was a lot consensus in the group. Second, the participants were part of the QIC faculty studied, and may be biased. On the other hand, they had unique, relevant knowledge and the experience to identify the practical implications of our findings. Greenhalgh et al. <sup>[43]</sup> describes the benefits and rigourness of sense-making as a research method to study more in depth quality improvement work. They state: “the act of sense-making is itself the construction of a narrative, requiring elements to be selected out, highlighted as significant or surprising, juxtaposed with one another (and with the existing cognitive schema), given meaning, and so on” <sup>[43 p. 447]</sup>. To improve validity and reliability, we used a strict method to interpret the data and simultaneously formulate hypotheses on how to improve the educational approach of logistics QICs. Despite these limitations we believe that the sense-making meetings enhanced the external validity of this research and the relevance for practice <sup>[70]</sup>. As Glasgow et al. <sup>[4]</sup> argue interactions between researchers and practitioners should be more widely promoted.

## 6.6 Conclusion

Our results, especially the knowledge derived from the sense-making meetings, seem relevant and beneficial to (logistics) QICs, and other (logistic) improvement projects as well. In this paper we shared insights into what knowledge and skills need to be transferred to participants in logistics QICs. Note that not only logistics and improvement skills are needed, but also project and change management skills. The Delphi study resulted in a set of necessary skills, which we tested with a questionnaire. The respondents scored all skills as important, supporting the validity of the list of skills derived from the Delphi study. In addition, the findings of this research extend prior research on the Availability of these skills in a project team, and whether participants in the QIC believe that their skills were increased by the logistics QIC. The findings suggest that analytical skills increased the most. In contrast, the skills needed for the primary aim of the logistics QIC (reduce access and throughput time) did not increase to a great degree.

The assumption of QIC methodology is that healthcare organizations can be changed as a whole by project teams that adopt new ideas, and become

competent at using improvement techniques in their own context <sup>[8]</sup>. With a variety of educational components, QICs support this learning process. Thus, QICs are temporary learning networks that aim to transform healthcare organizations into permanent learning organizations in which ongoing improvement projects are a daily routine <sup>[66]</sup>. Ideas generated in the sense-making meeting contributed to improving the educational components of the QIC studied. Suggestions were made to focus on project and change management skills, rather than focus merely on the patient logistics principles. In addition, the transfer knowledge to other colleagues, adjustments to principles taught to their own specific situation and inter-project translation of knowledge could get more emphasize on the transfer of knowledge. We call for a shift towards process-oriented transfer of knowledge to foster team learning based on inter-project translation of experiences. In this way we contribute to empirically derived insights into the improvement of logistics QICs. Better understanding of the challenges faced by logistics QICs is an essential first step in the development of theories to improve QICs as learning organizations <sup>[7,11,13,71]</sup>.

## **Acknowledgements**

The authors wish to thank Jolande Verhulst, Marije Stoffer, Marc Rouppe van der Voort (data gathering), Gerrit Koopman, Sara Slaghuis, Janine de Groot (data entrance and analysis) and Roland Bal (supervision) for their contributions to this study.

The research reported here was not funded. The Dutch quality collaborative, Faster Better, was funded by the Dutch Organization for Health Care Research and Innovation, ZONMW.

## **References**

1. Berwick DM, Nolan TW, Whittington J. The Triple Aim: Care, Health, and Cost. *Health Affairs* 2008;27 (3):759-769.
2. Vries J de, Huijsman R. Supply chain management in health services: an overview. *Supply Chain Management: An International Journal* 2011;16 (3):159-165.
3. Schneller ES, Smeltzer LR. *Strategic management of the healthcare supply chain*. San Francisco: Jossey-Bass, 2006.
4. Glasgow JM, Davies ML, Kaboli PJ. Findings from a national improvement collaborative: are improvements sustained? *BMJ quality & safety* 2012;21 (8):663-669.

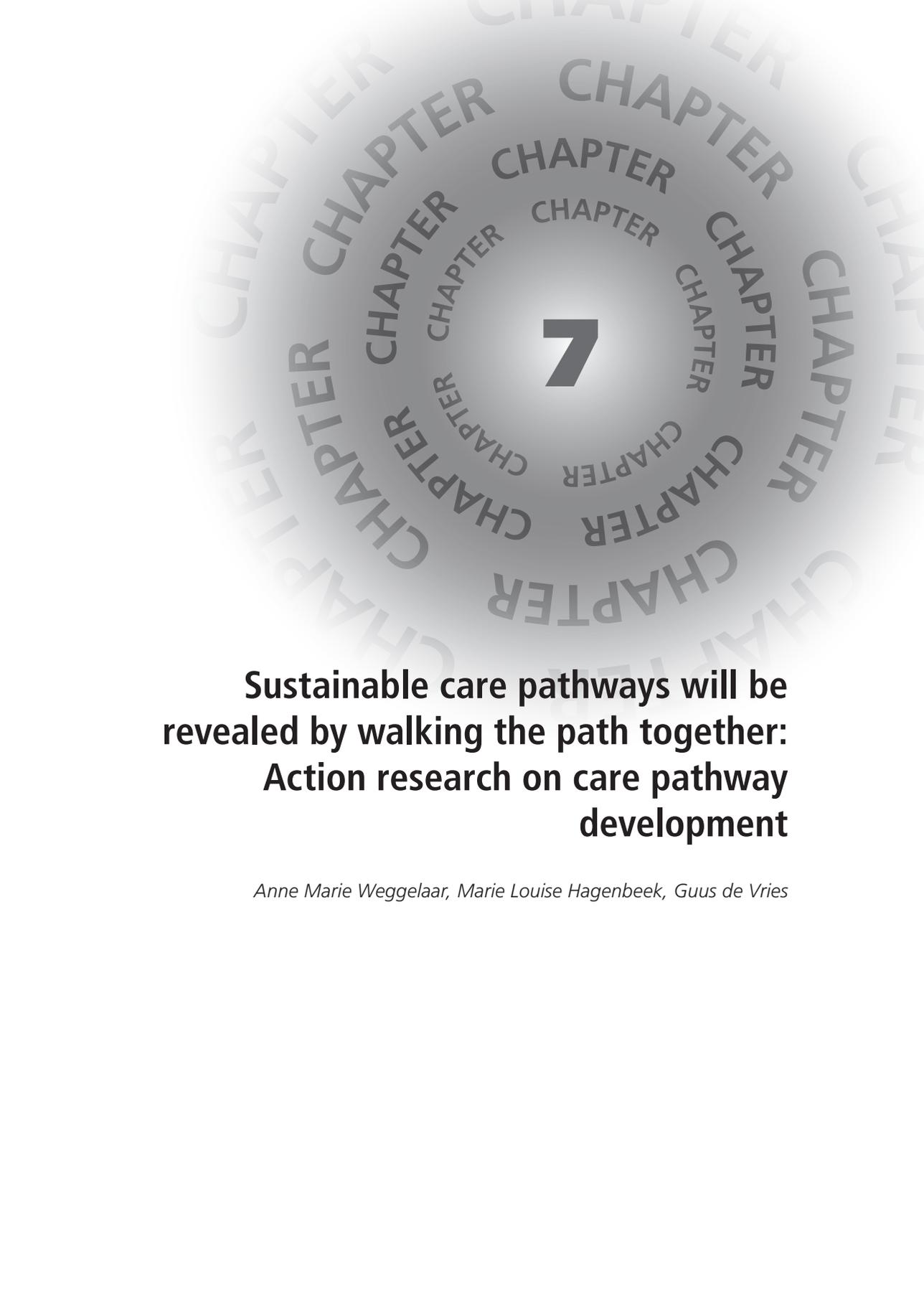
5. Braithwaite J, Westbrook M, Nugus P, et al.. Continuing differences between health professions' attitudes: the saga of accomplishing systems-wide interprofessionalism. *International Journal for Quality in Health Care* 2013;5:8-15.
6. Voort MR van der, Wijngaarden J van, Janssen S, et al.. Sustainability of improvements in access to outpatient specialist care in the Netherlands. *Journal of Health Services Research & Policy* 2014;19 (2):94-101.
7. Øvretveit J, Bate P, Cleary P, et al. Quality Collaboratives: lessons from research. *Quality and Safety in Health Care* 2002a;11:345-351.
8. Schouten LM, Niessen LW, Pas JW van de, et al.. Cost-effectiveness of a quality improvement collaborative focusing on patients with diabetes. *Medical care* 2010;48 (10):884-891.
9. Schouten LM, Hulscher ME, Everdingen JJ van, et al.. Evidence for the impact of quality improvement collaboratives: systematic review. *BMJ* 2008;336 (7659):1491-1494.
10. Wilson T, Berwick DM, Cleary PD. What Do Collaborative Improvement Projects Do? Experience from Seven Countries. *Joint Commission Journal on Quality and Patient Safety* 2003;2:85-93.
11. Øvretveit J, Gustafson D. Evaluation of quality improvement programmes. *Quality and Safety in Health Care* 2002b;1:270-275.
12. Ayers LR, Beyea SC, Godfrey MM, et al.. Quality improvement learning collaboratives. *Quality Management in Healthcare* 2005;14 (4):234-247.
13. Solberg LI. If you've seen one quality improvement collaborative.... *The Annals of Family Medicine* 2005;3 (3):198-199.
14. Berwick DM. Developing and testing changes in delivery of care. *Annals of Internal Medicine* 1998;128:651-656
15. Mittman BS. Creating Evidence Base for Quality Improvement Collaboratives. *Annals of Internal medicine* 2004;140:897-901.
16. Bate P, Robert G, McLeod H. Report on the Breakthrough Collaborative Approach to quality and service improvement within four regions of the NHS. Birmingham: The University of Birmingham; 2002.
17. Dückers MLA, Wagner C, Vos L, Groenewegen PP. Understanding organisational development, sustainability, and diffusion of innovations within hospitals participating in a multilevel quality collaborative. *Implementation Science* 2011;6:18-28.
18. Vos L, Dückers M, Buijn M de, et al.. Naar een procesgestuurd ziekenhuis: beoogde effecten van een logistiek verbeterprogramma. *TSG* 2008;86 (4):207-215.
19. Kowalski JC. Needed: a strategic approach to supply chain management. *Healthcare financial management: journal of the Healthcare Financial Management Association* 2009;63 (6):90-98.
20. Shih SC, Rivers PA, Hsu HS. Strategic information technology alliances for effective health-care supply chain management. *Health Services Management Research* 2009;22 (3):140-150.
21. Vissers J, Beech R. Health operations management: patient flow logistics in health-care. Oxford: Psychology Press, 2005.
22. Lent WA van, Sanders EM, Harten WH van. Exploring improvements in patient logistics in Dutch hospitals with a survey. *BMC health services research* 2012;12 (1):232.

23. Elkhuizen SG, Limburg M, Bakker PJM, Klazinga NS. (2006). Evidence-based re-engineering: re-engineering the evidence: A systematic review of the literature on business process redesign (BPR) in hospital care. *International Journal of Health Care Quality Assurance* 2006;19 (6):477-499.
24. Naveh E, Stern Z. How quality improvement programs can affect general hospital performance. *International Journal of Health Care Quality Assurance* 2005;18 (4):249-270.
25. Vest JR, Gamm LD. A critical review of the research literature on Six Sigma, Lean and studergroup's hardwiring excellence in the United States: the need to demonstrate and communicate the effectiveness of transformation strategies in healthcare. *Implementation Science* 2009;4 (1):35.
26. Weick KE. *Sensemaking in organizations*. Thousand Oaks: Sage Publications Incorporated, 1995.
27. Pawson R, Tilley N. *Realistic evaluation*. Thousand Oaks: Sage, 1997.
28. Franklin KK, Hart JK. Idea generation and exploration: benefits and limitations of the policy Delphi research method. *Innovative Higher Education* 2007;31 (4):237-246.
29. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *Journal of Advanced Nursing* 2000;32 (4):1008-1015.
30. Jones J, Hunter D. Consensus methods for medical and health services research. *British Medical Journal* 1995;311 (7001):376-380.
31. Gammelgaard B, Larson PD. Logistics skills and competencies for supply chain management. *Journal of Business Logistics* 2001;22 (2):27-50.
32. Murphy MK, Black NA, Lamping DL, et al.. Consensus development methods, and their use in clinical guideline development. *Health Technology Assessment*. 1998;2:1-88.
33. Campbell SM, Hann M, Roland MO, et al.. The effect of panel membership and feedback on ratings in a two-round Delphi survey: results of a randomized controlled trial. *Med Care* 1999;37:964-968.
34. Sharp A. Delphi Technique, Reference for Business, 2007. <http://www.referencefor-business.com/encyclopedia/Cos-Des/Delphi-Technique.html> Accessed December 27, 2014.
35. Boulkedid R, Abdoul H, Loustau M, et al.. Using and Reporting the Delphi Method for Selecting Healthcare Quality Indicators: A Systematic Review. *PLoS ONE* 2012. <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0020476>. Accessed December 27, 2014.
36. Leape LL, Park RE, Kahan JP, Brook RH. Group judgments of ppropriateness: the effect of panel composition. *Quality Assurance Health Care* 1992;4:151-159.
37. Linstone HA, Turoff M. *The Delphi method, Techniques and Applications*. 2002. <http://is.njit.edu/pubs/delphibook> Accessed December 27, 2014.
38. Iñaki HS, Landín GA, Fa MC. A Delphi study on motivation for ISO 9000 and EFQM. *International Journal Quality and Reliability Management* 2006;23:807-827.
39. Gwet KL. Computing inter rater reliability and its variance in the presence of high agreement. *British Journal of Mathematical and Statistical Psychology* 2008;61 (1):29-48.
40. Fleiss JL, Levin B, Paik MC *Statistical methods for rates and proportions*, 3rd ed. Hoboken: John Wiley & Sons, 2003.

41. Murray M, Berwick DM. Advanced Access: Reducing Waiting and Delays in Primary Care. *JAMA* 2003;289 (8):1035-1040.
42. Hammer M, Champy J. *Reengineering the Corporation: A Manifesto for Business Revolution*. New York: Harper Business, 1993.
43. Greenhalgh T, Russell J, Swinglehurst D. Narrative methods in quality improvement research. *Quality and Safety in Health Care* 2005;14 (6):443-449.
44. Maitlis S. The social processes of organizational sensemaking. *Academy of Management Journal* 2005;48 (1):21-49.
45. Creswell JW. *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks: Sage, 2012.
46. Baker GR. The contribution of case study research to knowledge of how to improve quality of care. *BMJ Quality and Safety* 2011;20:i30-i35.
47. Argyris C. Teaching smart people how to learn. *Harvard business review* 1991;69(3).
48. Groot G. de, Weggelaar- Jansen AM, Instrumenten om onproductieve gesprekken te analyseren In: Smid G. Rouwette EAJA. *Ruimte maken voor onderzoekende professionaliteit Assen: Van Gorcum, 2009: 299-329.*
49. Argyris C. *On organizational learning*. Oxford: Blackwell Publishers Ltd, 1999.
50. Senge PM. The fifth discipline. *Measuring Business Excellence* 1997;1 (3):46-51.
51. LeMay SA, Keller KA. The growth and development of logistics personnel. Council of Logistics Management. 1999 <http://trid.trb.org/view.aspx?id=650594> Accessed December 27, 2014.
52. Thai VV. Competency requirements for professionals in logistics and supply chain management. *International Journal of Logistics Research and Applications* 2012;15 (2):109-126.
53. Prajogo D, Sohal A. Supply chain professionals: A study of competencies, use of technologies, and future challenges. *International Journal of Operations & Production Management* 2013;33 (11/12):1532-1554.
54. Gleghorn DG, Ross Baker G. What faculty need to learn about improvement and how to teach it to others. *Journal of Interprofessional Care* 2000;14 (2):147-159.
55. Headrick LA. *Guidelines to accelerate teaching and learning about the improvement of healthcare*. Washington DC: Community based Quality Improvement Education for Health Professions Health Resources and Services Administration/Bureau of Health Professions, 1999.
56. Ogrinc G, Headrick LA, Mutha S, et al.. A framework for teaching medical students and residents about practice-based learning and improvement, synthesized from a literature review. *Academic Medicine* 2003;78 (7):748-756.
57. Ogrinc G, Headrick LA, Morrison LJ, Foster T. Teaching and Assessing Resident Competence in Practice based Learning and Improvement. *Journal of general internal medicine* 2004;19 (5):496-500.
58. Vinci LM, Oyler J, Johnson JK, Arora VM. Effect of a quality improvement curriculum on resident knowledge and skills in improvement. *Quality and Safety in Health Care* 2010;19 (4):351-354.
59. Kilo CM. A framework for collaborative improvement: lessons from the Institute for Healthcare Improvement's Breakthrough Series. *Quality Management in Healthcare* 1998;6 (4):1-14.

60. Nadeem E, Olin SS, Hill LC, et al.. Understanding the components of quality improvement collaboratives: A systematic literature review. *Milbank Quarterly* 2013;91 (2):354-394.
61. Eden C, Huxham C. Action research for management research. *British Journal of Management* 1996;7 (1):75-86.
62. Westbrook L. Qualitative research methods: A review of major stages, data analysis techniques, and quality controls. *Library & Information Science Research* 1994;16 (3):241-254.
63. Forman J, Damschroder L. Qualitative content analysis. *Empirical Research for Bioethics: A Primer*. Oxford, UK: Elsevier Publishing, 2008.
64. Davis D, O'Brien MAT, Freemantle N, et al.. Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or healthcare outcomes?. *JAMA* 1999;282 (9):867-874.
65. Hulscher ME, Schouten LM, Grol RP, Buchan, H. Determinants of success of quality improvement collaboratives: what does the literature show? *BMJ quality and safety* 2013;22 (1):19-31.
66. Pronovost PJ. Navigating adaptive challenges in quality improvement. *BMJ quality & safety* 2011;20 (7):560-563.
67. Dalkey N, Helmer O. An experimental application of the Delphi method to the use of experts. *Management Services* 1963;9:458-467.
68. Moreno PS, Portella Argelaguet E. Consensus doesn't always mean agreement: limitations of consensus methods in health services. *Gaceta Sanitaria* 1993;39:294-300.
69. Okoli C, Pawlowski SD. The Delphi method as a research tool: an example, design considerations and applications. *Information & Management* 2004;42 (1):15-29.
70. Verschuren P, Doorewaard H, Mellion MJ. *Designing a research project*. Eleven International Publishing House, 2010.
71. Mills PD, Weeks WB. Characteristics of Successful Quality Improvement Teams: Lessons from Five Collaborative Projects in the VHA. *Joint Commission Journal on Quality and Patient Safety* 2004;30 (3):152-162.





# 7

**Sustainable care pathways will be  
revealed by walking the path together:  
Action research on care pathway  
development**

*Anne Marie Weggelaar, Marie Louise Hagenbeek, Guus de Vries*



## 7.1 Introduction

The title refers to an old quote, meaning one needs to walk the path to truly understand the challenges. The development of care pathways as a tool to improve quality of care could be seen as a path with challenges. Knowing the best evidence-based treatment, the most efficient and patient-centred care process, or the most efficient, effective and safe way of organizing care processes, does not mean that this will be realized. An abundance of research has revealed the difficulties of achieving sustainable improvements with care pathways <sup>[1,2]</sup>.

This paper presents the findings of 14 months' action research on the development of ten care pathways within a university hospital in the Netherlands. Key challenges which multidisciplinary work groups faced during different phases of the development of care pathways are highlighted and how these influenced the dynamics of engaging other staff in the implementation. The objective of this research was to explore the 'frictions' which arose in pathway work groups during the pathway development process. The research question was: What kinds of frictions arise within multidisciplinary work groups developing care pathways, and how do these frictions influence the implementation of care pathways by staff? In the context of this research a friction is any issue which affects, whether positively (constructive increasing the effectiveness) or negatively (destructive impeding the effectiveness), the pathway development and implementation process.

Care pathways are defined in various ways in literature and may also be called critical pathways, clinical pathways or integrated pathways <sup>[3,4]</sup>. In this paper the term pathways is used and by this we refer to a complex intervention for the mutual decision-making and organization of care processes for a well-defined group of patients during a well-defined period, with the aim of enhancing quality of care across the continuum by improving risk-adjusted patient outcomes, promoting patient safety, increasing patient satisfaction, and optimizing the use of resources <sup>[5]</sup>. Pathways are used to improve several aspects of quality <sup>[6,7]</sup>: **1)** standardizing and reducing variation of care processes with low complexity and uncertainty <sup>[8-10]</sup> **2)** organizing care according to evidence-based algorithms or guidelines for a well-defined group of patients <sup>[4,11]</sup> **3)** providing continuity of care <sup>[12]</sup> **4)** providing more patient-centred care <sup>[1,13]</sup> by communicating more efficiently with patients and their families, and organizing care according to patient preferences <sup>[14]</sup> **5)** increasing safety <sup>[15]</sup> by decreasing complications <sup>[11]</sup> and **6)** optimizing use of resources and reducing costs <sup>[16,7]</sup>. In the literature several secondary effects of pathways are also described, such as enhanced transparency of treatment <sup>[2]</sup>, and

improved relationships among healthcare professionals with consensus about the approach to care provision <sup>[14,17]</sup>. Thus, pathways can be seen as ‘casting their net wide’, covering many bases as an approach to improving quality of care, combining issues of logistics, organization, clinical/evidence-based medicine and team collaboration. Although pathways are seen as a methodology for different quality improvement aims, evidence underpinning the desired results is still sparse <sup>[18]</sup>. As an explanation De Allegri et al. argue: “One of the reasons is that care pathway development and implementation are difficult, resource-consuming and often hampered by resistance or insufficient staff involvement” <sup>[2 p. 203]</sup>. In addition, Allen and Rixson <sup>[19]</sup> call for more in depth research on the generative mechanisms of pathways as ‘agents of service improvement’ <sup>[20 p. 354]</sup>.

Pathways are mostly developed in **work groups** consisting of representatives of employees from different departments. Work groups (also known as project teams or project groups) are commonly used in healthcare for improvement work <sup>[21-23]</sup>. They are set up on a temporary basis and comprise small groups of people (preferably with complementary skills) committed to a common purpose and change approach for which they hold themselves mutually accountable <sup>[24,25]</sup>. The implicit assumption is that work groups influence staff during the development and implementation of pathways and in doing so deliver the improvement results strived for <sup>[26]</sup>. Several studies identified a strong relationship between team effectiveness and the improvement results of pathways <sup>[17 20 27 28]</sup>. In a randomized controlled trial Denecker et al. <sup>[17]</sup> studied the results of pathways on team outcome indicators. Their research showed mainly positive results, but also revealed some hampering effects of pathways on increasing team effectiveness. Despite the mostly positive relationship between teams and pathways, there is no evidence about *how* they influence each other. To our knowledge no research has yet been carried out on what work groups encounter in the pathway development process. Hospitals’ reliance on work groups to make pathways ‘happen’ highlight the need for more in-depth studies to strengthen the scientific underpinning of this change approach.

## 7.2 Research methods

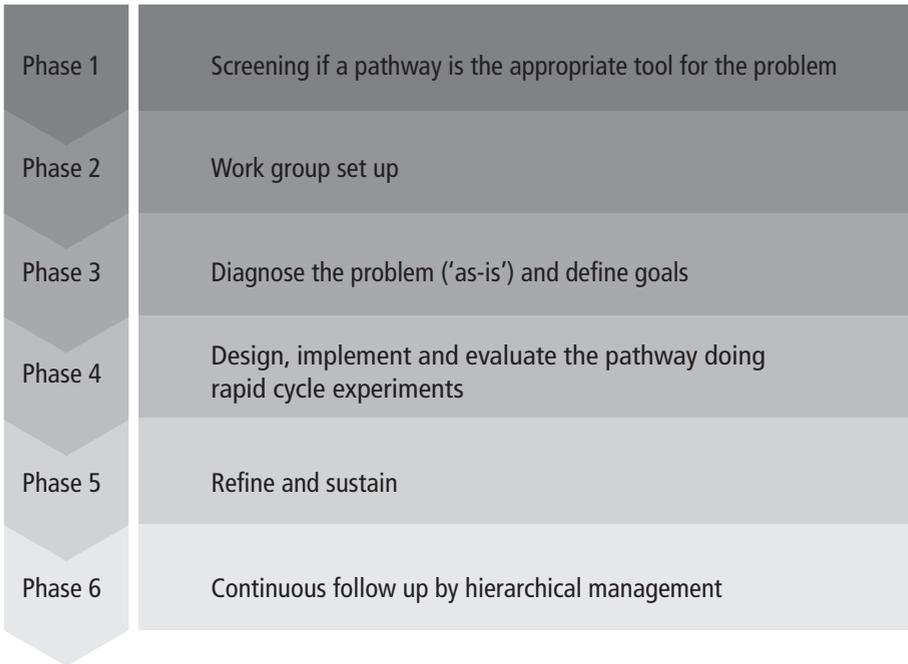
To gain more insight into the frictions that influence the development of pathways by work groups, it is crucial to include the context in which these work groups operate <sup>[29]</sup>. By studying underlying mechanisms in daily practice, new theoretical insights can be gained <sup>[30]</sup>. In the tradition of **action research** <sup>[31]</sup> the data was collected for this study. The researchers were member of the programme team

while simultaneously studying the pathway work groups. This methodological choice was based on four considerations. First, the research question is by nature explorative, owing to a lack of empirically-based concepts and theories <sup>[32]</sup>. Second, the development and implementation processes studied in different work groups are evolutionary processes with consecutive steps and therefore need to be studied as such. Third, and most important, it is not easy to gain insights into how work groups combine the development of 'the content' of a pathway while they simultaneously try to influence staff to change their work routine for the benefit of the pathway. Understanding of these interconnections cannot be gained by looking at these factors as independent objects. Rather this must be studied as a coherent and influencing system <sup>[33,34]</sup>. Fourth, by participating in the work groups and collecting data from actual situations the researchers had the opportunity to observe what work group members actually do, instead of what respondents say, as is common in interview-based case studies <sup>[35]</sup>. Argyris <sup>[36]</sup> describes this as the difference between espoused theory (what people say) and theory in use (what people actually do). Close observations <sup>[37]</sup> and participation in different work groups aids the understanding of what frictions either increase or impede the pathway development process and in what way <sup>[38]</sup>.

### **7.2.1 Case description**

We studied **ten work groups** collaborating in an improvement programme aiming to develop and implement pathways within a **Dutch academic hospital**. The hospital board wanted to work with pathways to improve care: "the right person, in the right place, doing the right thing, at the right time, with the right outcome and all with attention to the patient experience." (cf the description in the National Electronic Library for Health).

It was decided to work with ten inter-departmental work groups each responsible for the development of a pathway for demarcated patients population. The organization did not choose to set up a new organizational structure, but rather to create smooth paths for patients within the existing structures. The chosen patient populations consisted of both regular high volume care (e.g. diagnostics and treatment of varices or prostate carcinoma), and highly specialized care with lower volume (e.g. congenital anomalies of the upper extremities). The pathways were developed using an adjusted version of the seven phases of pathway development <sup>[39]</sup> based on the Plan-Do-Study-Act cycle of Deming <sup>[40]</sup>. Research has shown that first 'designing' the new situation and afterwards using the pathway as a change management 'tool' results in implementation and sustainability problems <sup>[16,20,41]</sup>. Therefore we combined the development and implementation phases (phase 4 and 5 of the seven phase method) in doing rapid



**Figure 7.1** Method used to design, implement and evaluate pathways

cycle Plan-Do-Study-Act experiments <sup>[42,43]</sup>. In essence this change approach is a collaborative 'trial-and-error learning' process; testing and optimizing suggested improvements on a small scale until satisfactory results, before proceeding to large scale implementation of the improvements. Thus, our pathway development methodology consisted of six phases (see figure 7.1).

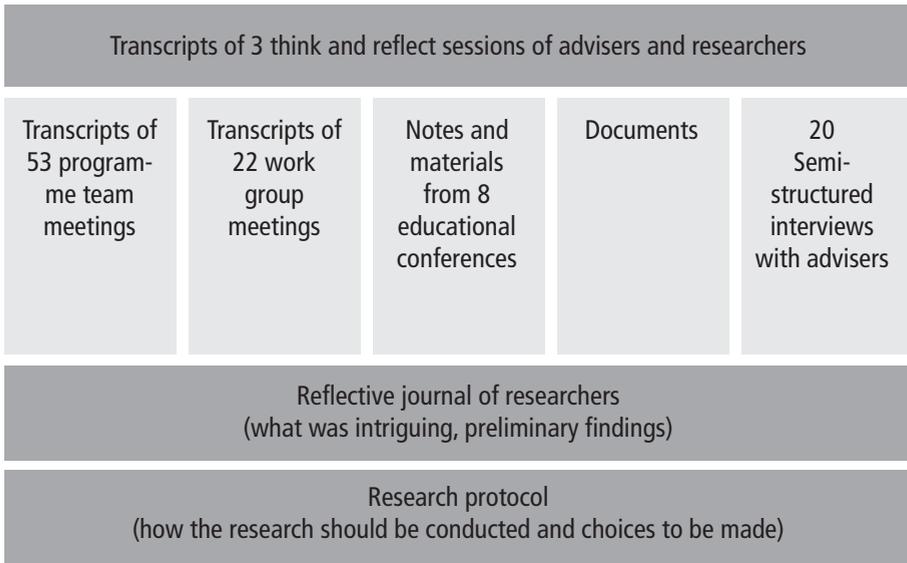
The studied pathway work groups were supported and steered by a programme team, directed by one of the hospital managers. Two researchers were members of the programme team. One of them was responsible for the educational support of the ten pathway work groups on methodology for pathway development and improvement approaches. The other was adviser to a work group developing a pathway. Both researchers were positioned to interact closely with advisers, supporting the ten work groups. The group of nine advisers and both researchers were engaged in a reflection and learning process during the whole project <sup>[44]</sup>.

## 7.2.2 Data collection

Action research is by nature participatory research in which researchers and their 'study objects' work together, rather than conducting research on 'study objects'

<sup>[33]</sup>. This was a crucial for our research because involvement of the work group members and advisers was essential to gain the necessary insight <sup>[45]</sup>. Eden and Huxham <sup>[46]</sup> highlight the importance of the rigorousness of empirical data collection when a researcher combines creating theoretical knowledge with simultaneously contributing to solving practical problems. We used several data collection methods (see figure 7.2).

1. The researchers used a **research protocol** with the research questions and limitations of the data collection and analysis methods in order to minimize the influence of their parallel role as programme team members. This research protocol was drawn up prior to commencing the research.
2. To collect data in a rigorous manner, the researchers maintained a **reflective journal** with contemporaneous field notes <sup>[47-49]</sup>. On the right side of this journal chronological descriptions of the facts were recorded, mainly based on observations and short analysis of written materials. On the left side systematic reflections on the facts that intrigued each researcher were made.
3. The reflective journal was supplemented with four different types of data. First, transcripts of 53 **programme team meetings** and 22 work group meetings of seven different work groups. Second, notes and educational material of eight centrally organized meetings to teach work group members how to develop and implement a pathway. Third, **documents** such as notes, minutes of meetings, presentations and emails of both the work groups and the programme team. Fourth, transcripts of 20 **semi-structured interviews** with eight work group advisers. In these interviews the researcher asked the advisers to share thick descriptions of 'meaningful events' about themes that had emerged from the initial data analysis. The researcher challenged the advisers to explicitly question and examine their underlying assumptions and beliefs by using the ladder of inference <sup>[36]</sup>. The researchers and advisers exchanged ideas in these interviews on how to improve the development process of pathways. Especially these interviews provided the researchers with more insight into the frictions faced by the work groups.
4. The researcher organized for the group of nine advisers 3 **'think and reflect sessions'** where research findings were shared <sup>[50]</sup>. These sessions were used for member checking purposes and to deepen the research findings, and also contributed to the education of the advisers. By sharing knowledge and mirroring mechanisms, reflection and learning among the advisers was fostered.



**Figure 7.2** Data collection of the study

Throughout the process of data gathering, triangulation was sought between the different data sources <sup>[46]</sup>. Preliminary findings based on initial analysis found their way back to change settings where their resonance and action ability could be tested. The research was moved forward when saturation had been achieved and change dynamics could be explained sufficiently.

### 7.2.3 Data analysis

All the data was analysed in a continuous process of immersion, reduction and interpretation <sup>[51]</sup>. Action research is a process-oriented research methodology grounded in experience and used in healthcare for identifying problems and improving practice <sup>[52,53]</sup>. One researcher began by using **open**, and subsequently **deductive, axial** coding supported by ATLAS-Ti software. Frictions were illuminated by examining variations and rival data until converging insights into patterns were gained <sup>[54]</sup>. The analysis of the first researcher was then discussed with the co-authors to strengthen the analysis <sup>[32]</sup>. Subsequently the frictions were presented to the programme team and advisers in the ‘think and reflect sessions’ for member checking purposes and to uncover any apparent misunderstandings <sup>[55]</sup>. A friction was added to our friction framework, when it occurred in at least four work groups and was recognized by all the advisers.

## 7.3 Findings

In this study the frictions in the work groups which influenced the implementation of the pathways were studied. To present our finding the development phases as shown in figure 7.1 are used as a heuristic framework. Each phase starts with a brief case description of how this phase was organized, to understand the context and choices made by the organization. This is followed by a description of the frictions that emerged from our data.

### 7.3.1 Phase 1: Screen whether a pathway is the appropriate tool for the problem

#### **Brief case description**

Management and physicians were invited to sign up for the pathway programme. In an application form specifics/details were shared about the patient population, diagnoses and treatment and problems faced. The board of directors chose ten pathways out of 25 applications. We studied the frictions during the pathway development process in the work groups, thus no frictions were encountered in this phase.

### 7.3.2 Phase 2: Work group set up

#### **Brief case description**

In the hospital studied (large) multidisciplinary groups of healthcare professionals are responsible for the care of a specific patient population. Staff work in different departments (e.g. outpatient clinics, operating theatres, inpatient wards), leading to somewhat fragmented management. Most staff do not meet each other face-to-face, especially when outpatient, diagnostic and inpatient care is spread out throughout the hospital. Therefore, ad hoc, suboptimal communication is common and aggravating to everyone. Because staff are part of several (temporary) teams in which they collaborate to provide care, their attention is dispersed. These are not the optimal circumstances to align the care processes needed for pathways.

In most pathways over 100 staff members are involved. By the nature of large

groups, this inevitably involves a significant level of complexity in human interaction. Therefore, the hospital chose to set-up cross-departmental work groups for one year. These work groups were seen as leading coalitions <sup>[56]</sup> to support the change which was necessary to work with pathways. The limited time frame of one year was chosen in order to focus on the targets set by the hospital. In addition, it was considered important to allow sufficient time for winding up the work group at the end of the projects and for involving management to ensure sustained change <sup>[57]</sup>. It was the explicit task of the work group not only to develop a pathway, but also to implement the pathway and to engage all staff from all involved departments.

### **Frictions**

Based on our data we found four frictions, related to the composition of the work group, which influenced the development of the pathway.

#### **1. Top management needs to communicate their reasons for using pathways.**

Top management, and not the work group members, needs to communicate extensively with all staff about their aim to work with pathways, both in the short and long term. Where this was lacking the staff generally felt that the pathway was being imposed upon them. They were weary of 'cookbook' medicine where they would have to adhere to a standardized protocol with little room for decisions deviating from this in order to respond to individual patients' needs. In these cases it was difficult to find work group members, because staff were reluctant to get involved. In order to help the staff to understand the point of it all, management needs to explain the reasons why they want to develop and implement pathways.

#### **2. Personal interests should not conflict with the aim of the pathway.**

Certain work group members tried to influence the development of the pathway in order to protect their personal interests or to gain more benefit for the professional group. For example, in two projects issues arose, due to the composition of the work group. In both projects, work group members were under the impression that the development of the pathway would heavily influence their job. They assumed they would lose power and/or more enjoyable work and/or receive additional 'chores' on top of their already busy schedule.

*"She is the coordinator for patients between several departments and needs to ensure that deadlines for the patient are met. She realises that as soon as the pathway has been implemented her job will be superfluous....Therefore she is not so interested in contributing and is trying to delay everything." (adviser 3 interview 2)*

In the “think and reflect” meetings the importance of openly discussing everybody’s personal and professional interests within the work group was emphasized.

**3. Work group members should have both skills to develop the pathway and skills to engage staff.**

It was a challenge to assemble a work group able to deliver on two tasks: the development of the pathway *and* the engagement of staff in its implementation. Problems arose when work group members were selected from different departments and professions without ensuring that they possessed sufficiently diverse and complementary skills. This resulted in a lack of certain skills within the work group. In addition, interpersonal communication skills were especially important to effectively engage staff in pathway implementation. For instance, three work groups consisted of the most important/influential people, because it was assumed that they would be most able to influence and engage staff. However, in reality these work groups had too many ‘leaders’ and power issues inevitably arose.

*“In these projects the highest ranking physician wanted to be the work group leader, but didn’t have the skills nor the time to steer the work group. One physician wanted to be the work group leader, because he felt it was his ‘duty’. The other was afraid that there were proposed changes which he could not approve. Since they did not steer the work group, others had to take over the task. Next, the problems started... I got the feeling somebody from the back seat was trying to drive the car, who decelerated every time the physician behind the wheel wanted to make progress.”* (think and reflect session 1).

In those three work groups the composition of the work group was adjusted during the project. In other work groups members were added to the workgroup and/or other staff and management were involved in the implementation process during the development of the pathway.

**4. Work groups should have sufficient ‘manpower’.**

Developing and implementing a pathway involves a great deal of work. For example, in two work groups members were not given enough time to carry out all the work. These work groups got off to a bumpy start, because members were too often absent from the meetings. In most work groups at least one ‘workhorse’, somebody who could spend more time on the project (such as a specialized nurse or dedicated administrative staff employee), was present. She/he accelerated the pathway development process, because she/he had the time to prepare an idea or plan for consideration or discussion in the work group and

took up the project management role.

### **7.3.3 Phase 3: Diagnose the problem and define goals**

#### **Brief case description**

All the work groups were invited to a conference in which information was shared about the pathway methodology and the aims of the hospital board with respect to pathway development. During this conference work groups had the time to work on their project, i.e. defining the patient population, devising an abstract process description of the patient flow through the organization and outlining the problems experienced by staff. Work groups left the conference with the 'homework' task of checking the accuracy of the process description and verifying with their colleagues which problems they wanted to solve by using a pathway. In the next conference this task was completed and the work groups formulated measurable improvement goals and defined adjacent indicators.

#### **Frictions**

Frictions were particularly found in the goal setting process. This process influenced not only the content of the desired change, but also some crucial/essential change management processes.

#### **5. A shared ambition or vision for the future discussed with peers is more appealing and provides the alignment needed for the implementation of a pathway.**

A friction was noticed in an implicit process at the level of the individual; this concerned the balance between the individuals' own needs (Will I participate?, What's in it for me?) and external demand (Do I support the objectives of the organization?, Will I comply with the task given). For example, one surgeon was only interested in participating because he wanted more time to work in the operating theatre. As soon as other goals emerged, he repeatedly questioned the purpose of the pathway (development). In addition, the advisers observed that time and again two key questions arose in most of the work groups: "what is our assignment?" combined with "who are we answerable to?". The latter was certainly not clear: was it the programme leader who had overall responsibility for the ten development projects or the project leader assigned to this particular work group or one's own hierarchical department manager(s) or even the Board of Directors who decided it was to develop pathways? Clarification was sought and sometimes required negotiation with staff and management in order to have

a clear direction. The advisers referred to these struggles as “the murky stage of work group members settling into and aligning themselves with the context of the project.”

Two work groups which took more time to discuss existing problems and desired improvement objectives within their own department or professional team had fewer conflicts during the project and especially during implementation of the pathway. They seemed to reach an agreement on the importance of different goals by discussing the possibilities of achieving a win-win situation for all involved. Interestingly, these two work groups formulated a challenging and inspiring dream or ambition instead of measurable goals. For example: “We are the best hand surgery team in Europe and operate on the most complex problems children face with the aim of improving every child’s life.”

*“By shifting away from clear defined shared goals towards a vision for the future, a shared ambition guided the work group. I believe this vision was easier to communicate to other staff. Nobody wanted to oppose the transformation of a child’s life, or being part of the best European team. I assume performance measurements are not so ‘inspiring’ to communicate and can more readily trigger disputes.”*  
(think and reflect session 3).

## **6. All stakeholders should have a shared understanding and alignment on the objectives of the pathway.**

In most work groups the goal setting process paved a clear path for decision making. A combined top-down and bottom-up process of determining goals was seen as important by the advisers. In this process different perspectives on important objectives were taken into consideration. The work group had to balance proposed goals originating from management (top down) and from the staff (bottom up). In addition, external demands (e.g. from governmental level, public opinion, patient representative groups and professional bodies) had to be aligned with local problems which needed addressing or challenges valuable to healthcare professionals. These different layers sometimes required multiple steps in the goal setting process. At first it seemed that these work groups did not make progress quickly enough or were reluctant to start the improvement process. However, after a while the notion arose that this initial goal setting process in conjunction with their stakeholders was crucial for improvement, because these work groups were able to engage every stakeholder and get them aligned with the improvement aims.

## **7. Narratives and visuals are strong communication tools.**

The use of narratives and visualisations contributed constructively. The commu-

nication with staff was supported by using visuals showing cause and effect relationships or narratives on recognizable daily problems in combination with the defined goals. For instance, two work groups created an image of all the desired goals (one picture, the other a cartoon) and in doing so had a strong communication tool to interest the staff in the pathway development.

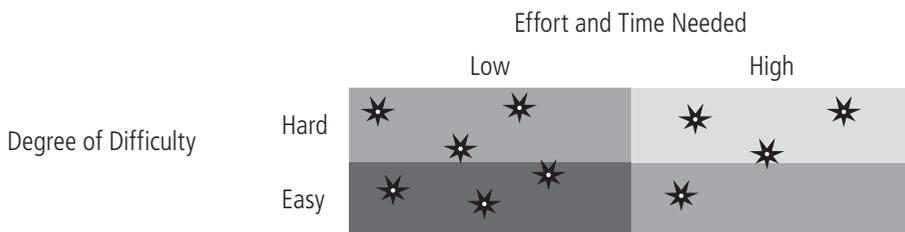
### 7.3.4 Phase 4: Design, implement and evaluate the pathway doing rapid cycle experiments

#### Brief case description

In this phase the work groups initiated rapid cycle experiments to improve daily care into the desired direction of the pathway. Alongside these experiments, measurements about the current performance of the team were performed. For these experiments and measurements it was important to include not only the work group members but all staff involved in the care processes of this particular patient group.

To decide which experiments to start with, all work groups used a matrix based on time and effort required to set priorities in the desired experiments (see figure 7.3).

They began with experiments rated as both rapidly accomplishable and requiring little effort, since these would most readily motivate staff in the change process. Simultaneously they embarked on the experiments rated as time consuming and requiring a large amount of effort: the stubborn changes. As soon as the easier experiments started to achieve their objectives, the work groups commenced experiments from the other parts of the matrix. This helped the teams to prioritize and to avoid goals failing to be reached within the specified time frame.



**Figure 7.3** Matrix for choosing interventions to improve

### **Frictions**

The major frictions in this phase arose from divided opinions within the work groups about 'rules' and how these could be applied to control individual behaviour of staff.

#### **8. Knowledge of existing prejudices in the organization helps to make staff compliant with the new pathway rules.**

In all work groups discussions were held about the rules required for proper execution of the way and how to achieve compliance with them. The advisers expressed the importance of knowing which goals are important to whom, because this helped staff to see what the win-win situations are when they comply with the rules.

*"We developed logistic rules for the pathway in the work group. Next, we made a communication plan and plotted every profession, department and stakeholder according to their desires and the opposing arguments we anticipated from them. Then every work group member approached these teams to explain the new rules. They had to sell it using the right arguments. For some work group members this was quite a tough task... Therefore, I supported them in this." (adviser 8, interview 2)*

During interaction with the staff, issues arose around the autonomy of professionals and departments. The fear of management making restrictions on individual patients' needs was expressed. Several times work group members needed to clarify that pathways are guidance tools and provide structure for the organizational and logistical processes. The decision making power regarding of when and how to deviate still remains with the individual physician.

The work group members addressed the different professions on their competence/professional attitude and by clarifying their specific role in the pathway, the necessity for changes became more apparent. In addition to extensive communication, assigning experimental tasks to specific departments or professions, who would most benefit from the results, also helped. These experiments supported feelings of 'ownership' regarding the improvements. One of the frictions which constructively contributed to compliance with the new 'rules' was the role of hierarchal management. The work group members initiated the discussions with staff, and formal management then picked up their role on leading the staff into the new work routine.

#### **9. Written agreements about the pathway help to give feedback.**

Putting the new pathway and associated 'rules' in writing was done in every

work group without any direction from the programme team. One conversation with a leading consultant clinician revealed why written agreements are important for improvement work. The researcher questioned the usefulness of putting everything on paper and asked why it was important to do this:

*“My daily routine is based on writing prescriptions for patients, writing orders during ward visits for nurses, writing requests for diagnostic tests administrated by my supportive staff and so on. After I assign these tasks in writing, other people [staff, patients] arrange these activities.... If there is nothing described nothing will happen.”* (meeting work group 5)

The advisers concluded in a learning session that physicians have a strong feeling that what is written down will become reality. The advisers explained that at first, several physicians asked for structure/clarity on who is doing what in the pathway and who is responsible when things go wrong. Most physicians were not so interested in being actively involved in the experiments and needed lots of encouragement by the other work group members and advisers to give feedback to colleagues who did not comply. One physician member of a work group expressed his concern:

*“Who am I to tell colleagues, who have been in the profession for 15 years longer than me and are three steps above me on the professional ladder, how to do their job?”* (meeting work group 4)

Having written agreements about the pathway ‘rules’ seemed to make it easier to give feedback; feedback will not then be seen as a personal opinion but as a clarification on the ‘rules’.

#### **10. Visuals of data support the discussion on the (desired) changes.**

In this phase using visuals was again very constructive. The data based on analysis of experiments and of measurements of current performance were displayed with visuals (graphs, thermometers or traffic lights) on posters, in PowerPoints and screensavers. When these graphs were discussed in meetings the advisers noticed that staff had started to make sense of the improvement plans and curiosity had been raised, ultimately supporting implementation of the pathways. In addition, these meetings around visuals provided a venue to discuss the results and collect new improvement ideas. A learning process based on assessment of past performance and previous experiences steered innovative thinking on new ways to provide care and new methods. Professionals felt rewarded for their innovative suggestions and contribution in the experiments, and thereby

the motivation to work with the pathway increased. In the work groups where results were used, not for accountability or competition between departments, but rather as positive learning tools, positive energy was created.

### **7.3.5 Phase 5: Refine and sustain improvements made by experiments**

#### **Brief case description**

It was crucial in this phase to firmly secure the improvements made and goals achieved. Work groups were encouraged to seek permanent solutions and no longer to rely on individual goodwill (in experiments). Hindering structures needed to be abandoned and the work group members had to ensure that their colleagues were compliant with the new work routine and 'rules'. Therefore, each work group member had now to give their colleagues feedback and explain what was needed.

#### **Frictions**

During this phase a high degree of emotion appeared in the work groups which led to three frictions.

#### **11. Work group member's emotions need to be expressed in order to remain motivated for dealing with the stubborn implementation problems.**

Emotions related to sustainability of the results became apparent. Work group members expressed disappointment, anger and frustration, but also satisfaction and happiness when the results showed significant improvements. They expressed the difficulties they felt in being part of the leading coalition <sup>[56]</sup>. They felt that colleagues held them responsible for all kinds of issues which needed to be resolved to sustain the pathway, but which they did not have the (formal) power to influence. These issues were related to people (actors) but also equipment, processes and decisions (factors). Most work group members struggled with 'laggards' in their grassroots and stubborn problems which were tough to solve. By expressing their feelings in the work group and understanding that every body was facing these challenges, work group members no longer felt so disheartened.

#### **12. Feedback on written rules in combination with learning spaces to reflect on the new agreements is helpful during implementation.**

Concurrent movements in opposite directions in all work groups occurred. All

work groups made written rules, because the second learning session with the advisers showed the importance of this. Some work groups shared these rules as if they were 'laws', expecting management to follow up and if necessary to 'correct' staff who disobeyed them.

However, other work groups used these written rules to reflect on the new routines and set up feedback and learning spaces. In this space the rules were discussed and staff were convinced using arguments.

*"We made the rules very clear, otherwise everybody could still do whatever he or she wanted, just like the situation before. There was no escape; everybody had to align with the new rules and time frame. The argument that this is the best for this particular patient was also not possible anymore, because exceptions needed to be discussed with X [the consultant physician]. Nobody discussed an exception with X to my knowledge.... I assume everybody knew they had to comply."* (adviser work group 2).

Continuous feedback helped in both directions and the advisers explained that both directions should be used to implement the pathway and make the step from more or less noncommittal experiments to new work routines.

### **13. Feedback should overcome differences in cultures, status and power boundaries.**

Tensions and emotions arose between work group members. Professionally distinct cultures, power boundaries and status differences were displayed in this phase. For example, could and should the administrative work group member ask the physician to be compliant to the set 'rules' of the new pathway? Everyone had different expectations of individual responsibility for sustaining the experiments and implementing the pathway. It was felt that the ties and obligations involved in being part of the work group sometimes outweighed the benefits.

*"I believe I have to put an issue on the table about supporting each other in this last phase of this improvement project. Some work group members complain that others are not willing to stick their necks out for the pathway. Others feel it is not a 'sexy' task which might help one to get a promotion in the future. Others feel we are in this together and unless everybody contributes, I do not want to be the only 'prig' giving feedback anymore. This is a hidden process which is getting in the way of us reaching the finish line."* (adviser work group 6).

### 7.3.6 Phase 6: Continuous follow up - transition to hierarchical management and decommissioning of the work group

#### **Brief case description:**

In this last phase – at the end of the 12 months – the work groups and programme team were disbanded and the task of maintaining the results and further improvement was handed over to hierarchical management. In a final conference all work groups presented their project and their results to the Hospital Board. All work group members were rewarded with a small token of appreciation.

#### **Frictions**

This last phase was not studied in depth, because the researchers were no longer assigned to the programme team anymore. Nevertheless, in the development of pathways this is the phase of weaving the pathway into formal quality and accountability structures <sup>[61]</sup>.

#### **14. Retrospective learning.**

In the final think and reflect session a friction showed how to consolidate the pathway in a positive way. Four work groups made explicit what they had learned during the development and implementation of the pathway. The advisers made the assumption that fostering learning via retrospective experiences supports prospective learning. The advisers' hypothesized that this kind of retrospective learning during the project should also increase the intra- and inter-project learning. Questions that could guide the meeting are: *What worked, how and why (not)? If you could do this again what would you do differently?*

## 7.4 Discussion

Despite the growing number of pathways and increase in the variety of purposes <sup>[58]</sup> evidence of the effectiveness of pathways is equivocal <sup>[19,20]</sup>. Deneckere et al. <sup>[59]</sup> are of the opinion that indicators show the effectiveness of pathways, but **team indicators** and **context variables** are key to understanding why and how pathways provide these effects. Vanhaecht et al. conclude that most pathway studies do not “describe in sufficient detail either the intervention or the context, or how the study draws this boundary” <sup>[59 p. 37]</sup>. In addition, Vanhaecht et al. <sup>[60]</sup>, Barbieri et al. <sup>[61]</sup> and Allen and Rixson <sup>[19]</sup> call for more studies on the context of

the involved organization and the mechanisms used to improve. Our study fills this gap in current literature and focuses on the development and implementation of pathways conducted by a work group. In this study we focused especially on what hinders and supports the work group and found 14 frictions and described how the work groups handled these frictions.

Three frictions displayed the **internal dynamics within the work group**, such as personal conflicts of interest regarding the aim of the pathway (friction 2), having sufficient 'manpower' (friction 4) and having the opportunity to express emotions to stay motivated when stubborn problems arise (friction 11). Previous research on pathways shows the importance of supporting resources, such as having the time and 'manpower' to underpin implementation in daily practices [20, 62]. In addition, one friction concerned a 'learning process' of work group members. Inter-project learning was supported by collaborative reflecting on their experiences at the end of the project (friction 14). The reflection offered opportunities to translate knowledge and experiences from this pathway development project to another pathway development process or to similar problems or situations. Waldman et al. emphasize the importance of setting up a continuous learning process in their paper on the use of learning curve theory to reduce errors in healthcare: "Care pathways can provide improved outcomes: better quality of care at reduced cost. However, to develop a systematic approach that capitalizes on previous experience requires: reviews of past performance; innovative thinking of new ways to accomplish the same goal; trials of new procedures; assessment of the outcome of new methods; and integration of all providers involved in the value chain for successful implementation [62 p. 50]. Waldman et al. suggest to apply reflection not only during the development process, but also on the improvement results as a mean to continuously develop the pathway.

We also found several frictions related to **how** the work group members **influenced and engaged staff** in pathway implementation. These frictions concerned the communication between work group members and staff when trying to involve them in the pathway implementation:

1. Use a broader vision or ambition for the future rather than measurable goals (friction 5).
2. Use narratives and visuals (of data) in the communication (friction 7 and 10).
3. Use the prejudices in the organization in the communication to make staff compliant with the new pathway 'rules' (friction 8).
4. All work group members should give feedback; beyond culture, power and status boundaries (friction 13) using written agreements as justification for

their remarks (friction 9).

5. Organize learning spaces with staff to reflect (friction 12).

Allen et al. conclude based on a systematic review of the effectiveness of pathways that pathways are effective methods to change “professional behaviour in the desired direction, where there is scope for improvement... Even in contexts in which health professionals are already experienced with a particular pathway, pathway use brings additional beneficial effects in directing professional practice in the desired direction” [20 p. 61]. Kwan [18] suggests that it is the *process* of pathway development that has most impact on behaviour, rather than the use of the pathway as an artefact per se.

Other frictions focussed around the **role of management**: communicate about your aims (friction 1) and provide all stakeholders with a shared understanding of the objectives (friction 6). These two frictions are perceived as challenging for the inter-professional cooperation between healthcare professionals and managers [60]. In almost every pathway development manual the importance of commitment of senior management and the importance of guidance and direction of senior staff is mentioned [63]. Some authors [39,58] argue for the need of clarity of purposes, but our research shows that work group members had multiple objectives. The objectives were discussed within the work group (see friction 1) and with stakeholders (friction 1,6). Deneckere et al. showed the importance of goal setting for pathways: “By clearly defining these shared goals, a team vision is built up and shared concern for quality of task performance, or task orientation, is developed” [17 p. 103]. Røsstad et al. [14] describes this process of goal setting as a tug of war between professionals and illuminates the confusion and consternation arising from these different perspectives. Clarity of intent, shared goals and stability of purpose are also key findings in other pathway research [2,14,19] on improvement projects.

## 7.5 Limitations

The described frictions emanate from **action research data**. Action research in itself has some limitations [64-66]. Action research implies a contextualized cyclic process in which the research findings can be used to change the studied practice [64]. In action research the studied object, subject and researcher will by nature influence each other. This raises the question how ‘valuable’ research findings are for science, since the internal, construct and external validity can

be questioned. By using an explicit research framework, triangulation of data, cross-case analysis methods and member checking in a clear chain of evidence we tried to be as rigorous as possible <sup>[34,67]</sup>. Nevertheless, **the sample size** was relatively small and contextual factors have influenced the results. The brief case descriptions contribute to the external validity of this research and provide information which can be used to compare our findings with other improvement projects. Therefore, we contribute to the body of knowledge on pathway development and our findings can be used in the development and implementation of pathways in future pathway development projects. However, studying only ten work groups in one particular context and only in this development stage does not provide sufficient evidence for a theoretical framework. Organizations differ in their readiness for change, the pathway objectives they aim for and the conditions needed for success <sup>[29,59,68]</sup>. Thus, a generalizable development and implementation approach that is suitable for all work groups working within hospitals is not yet possible. More studies are needed to confirm our findings. We would welcome a multicentre study which includes data of the context <sup>[7]</sup> and pathway development processes based on the SQUIRE guidelines <sup>[69]</sup>.

## 7.6 Conclusion

In our research we focused on different key challenges and dynamics – called frictions – which work groups faced during the different phases of pathway development and implementation. We disclosed 14 frictions which arose during the development of pathways and showed how these frictions influenced the collaboration within the work groups and the implementation of pathways. Table 7.1 portrays for each development phase the friction themes that emerged from our data.

**Table 7.1**

Phase	Internal dynamics	Role of management	Vision & ambition	Communication with staff	Learning space
1					
2	2, 4	1, 3			
3		6	5	7	
4				8, 9, 10	
5	11			13	12
6					14

## Acknowledgements

The authors wish to thank the programme team, work group members and advisers of the Erasmus Medical Centre for their contribution to this research.

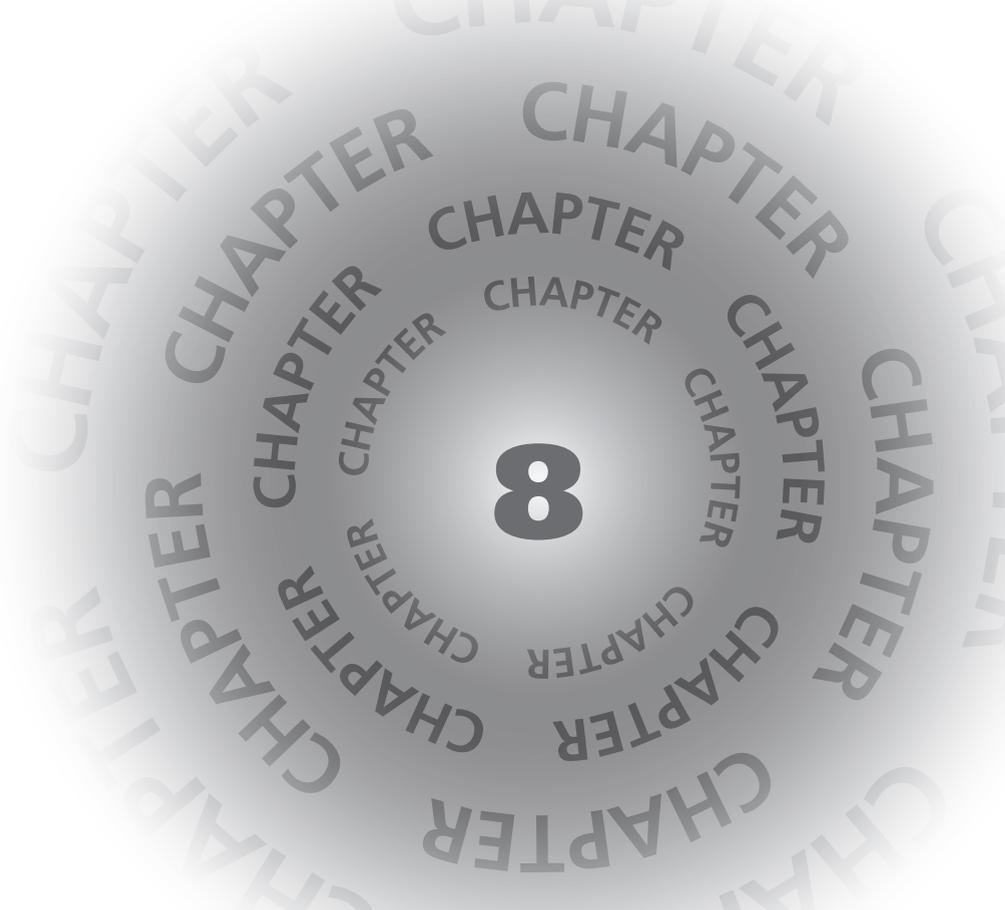
## References

1. Sorbero ME, Farley DO, Mattke S, Lovejoy SL. Outcome measures for effective team-work in inpatient care: final report. UK: Rand Corporation, 2008.
2. De Allegri M, Schwarzbach M, Loerbroks A, Ronellenfisch U. Which factors are important for the successful development and implementation of clinical pathways? A qualitative study. *BMJ quality & safety* 2011;20 (3):203-208.
3. De Bleser L, Depreitere R, Waele KD, et al.. Defining pathways. *Journal of Nursing Management* 2006;14 (7):553-563.
4. Kinsman L, Rotter T, James E, et al.. What is a clinical pathway? Development of a definition to inform the debate. *BMC Medicine* 2010;8 (1):31.
5. European Pathway Association definition <http://www.e-p-a.org/clinical---care-pathways/index.html> Accessed February 2015, based on Vanhaecht K. The impact of clinical pathways on the organisation of care processes. PhD dissertation Leuven: Katholieke Universiteit Leuven, 2007.
6. Vanhaecht K, Bollmann M, Bower K, et al.. Prevalence and use of clinical pathways in 23 countries—an international survey by the European Pathway Association. *Journal of Integrated Pathways* 2006;10 (1):28-34.
7. Vanhaecht K, Ovreteit J, Elliott MJ, et al.. Have we drawn the wrong conclusions about the value of care pathways? Is a Cochrane review appropriate?. *Evaluation the health professions* 2012;35 (1):28-42.
8. Panella M, Marchisio S, Di Stanislao F. Reducing clinical variations with clinical pathways: do pathways work?. *International Journal for Quality in Health Care*, 2003;15 (6):509-521.
9. McDonald KM, Sundaram V, Bravata DM, et al.. Closing the quality gap: a critical analysis of quality improvement strategies 2007; 7.
10. Lodewijckx C, Sermeus W, Panella M, et al.. Impact of care pathways for in-hospital management of COPD exacerbation: a systematic review. *International journal of nursing studies* 2011;48 (11):1445-1456.
11. Rotter T, Kinsman L, James E, et al.. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. *Cochrane Database Syst Review* 2010;3 (3).
12. Vanhaecht K, De Witte K, Panella M, Sermeus W. Do pathways lead to better organized care processes?. *Journal of evaluation in clinical practice* 2009;15 (5):782-788.
13. Røsstad T, Garåsen H, Steinsbekk A, et al.. Development of a patient-centred care pathway across healthcare providers: a qualitative study. *BMC health services research* 2013;13 (1):121.

14. Vanhaecht K, The Impact of Clinical Pathways on the Organisation of Care Processes [dissertation]. Leuven: KU Leuven, 2007.
15. Kurtin P, Stucky E. Standardize to excellence: improving the quality and safety of care with clinical pathways. *Pediatric Clinics of North America* 2009;56 (4):893-904.
16. Degeling PJ, Maxwell S, Iedema R, Hunter DJ. Making clinical governance work. *BMJ: British Medical Journal* 2004;329 (7467):679.
17. Deneckere S, Euwema M, Lodewijckx C, et al.. Better interprofessional teamwork, higher level of organized care, and lower risk of burnout in acute health care teams using care pathways: a cluster randomized controlled trial. *Medical Care* 2013;51 (1): 99-107.
18. Kwan J, Sandercock P. In-hospital care pathways for stroke: a Cochrane systematic review. *Stroke* 2003;34 (2):587-588.
19. Allen D, Gillen E, Rixson L. Systematic review of the effectiveness of integrated care pathways: what works, for whom, in which circumstances?. *International Journal of Evidence-Based Healthcare* 2009;7 (2):61-74.
20. Allen D. From boundary concept to boundary object: the practice and politics of care pathway development. *Social Science Medicine* 2009;69 (3):354-361.
21. Mills PD, Weeks WB. Characteristics of successful quality improvement teams: lessons from five collaborative projects in the VHA. *Joint Commission Journal on Quality and Patient Safety* 2004;30 (3):152-162.
22. 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 quality and safety* 2012;21 (10):876-884.
23. Santana C, Curry LA, Nembhard IM, et al.. Behaviors of successful interdisciplinary hospital quality improvement teams. *Journal Hospital Medicine* 2011;6:501-506.
24. Katzenbach JR, Smith DK. *The wisdom of teams: Creating the high-performance organization*. Harvard Business Press, 1992.
25. Tannenbaum SI, Beard RL, Salas E. Team building and its influence on team effectiveness: An examination of conceptual and empirical developments, 1992 *Advances in psychology* 1992;82:117-15.
26. Øvretveit J. The future for care pathways. *International Journal of Care Pathways* 2010;14 (2):76-78
27. Wang MC, Hyun JK, Harrison MI, et al.. Redesigning health systems for quality: lessons from emerging practices. *Joint Commission Journal on Quality and Patient Safety* 2006;32 (11):599-611.
28. Thomas EJ. Improving teamwork in healthcare: current approaches and the path forward. *BMJ Quality Safety* 2011; 20 (8):647-650.
29. Goldmann D. Five puzzle pieces, ten cautionary notes. *International Journal of Care Pathways* 2010;14 (1):33-35.
30. Berwick DM. The science of improvement. *Jama* 2008;299 (10):1182-1184
31. Coughlan P, Coughlan D. Action research for operations management. *International journal of operations production management*; 2002;22 (2):220-240.
32. Bradley EH, Curry LA, Devers KJ. Qualitative data analysis for health services research: developing taxonomy, themes, and theory. *Health services research* 2007;42 (4):1758-1772.

33. Reason P, Bradbury H. Handbook of action research: Participative inquiry and practice. Thousand Oaks, CA: Sage Publications Limited, 2001.
34. Coghlan D, Brannick T. Doing action research in your own organization. SAGE Publications Limited, 2009.
35. Avison DE, Lau F, Myers MD, Nielsen PA. Action research. Communications of the ACM 1999;42 (1):94-97.
36. Argyris C Teaching smart people how to learn. Harvard business review 1991;69 (3).
37. De Walt KM, DeWalt BR. Participant observation: A guide for fieldworkers. Rowman Altamira, 2010.
38. Westbrook R. Action research: a new paradigm for research in production and operations management. International Journal of Operations Production Management 1995;15 (12):6-20.
39. Vanhaecht K, Van Gerven E, Deneckere S, et al.. The 7-phase method to design, implement and evaluate care pathways. International Journal of Person Centered Medicine 2012;2 (3):341-351.
40. Deming WE. Out of the crisis. Cambridge, MA: Massachusetts Institute of Technology. Center for Advanced Engineering Study, 1986.
41. Hunter B. The all Wales clinical pathway for normal labour: What are the experiences of midwives, doctors, managers and mothers? Swansea: Swansea University, 2007.
42. Moen RD, Nolan TW, Provost LP. Quality improvement through planned experimentation. New York: McGraw-Hill, 1999.
43. Varkey P, Reller MK, Resar RK. Basics of quality improvement in health care. Mayo Clinic Proceedings 2007;82 (6):735-739.
44. Coughlan P, Coghlan D. Action learning: towards a framework in inter-organisational settings. Action Learning: Research and Practice 2004;1 (1):43-61.
45. Schein EH. Process consultation, action research and clinical inquiry: are they the same?. Journal of Managerial Psychology 1995;10 (6):14-19.
46. Eden C, Huxham C. Action research for management research. British Journal of Management 1996; 7 (1):75-86.
47. Kessener B. Reflecteren meer dan evalueren. Management Consultant Magazine 2003;5:28-31.
48. Kessener B, Termeer CJAM. Organizing in-depth learning: change as reflective sensemaking. Intervening and Changing, Looking for Meaning in Interactions, Wiley: West-Sussex, 2007,229-243.
49. Schein EH. The clinical perspective in fieldwork. Sage Publications, Inc, 1987
50. Schön D, Argyris C. Organizational learning II: Theory, method and practice. Reading, 1996.
51. Coffey AA, Atkinson P. Making sense of qualitative data: Complementary research strategies. Sage, 1996.
52. Winter R, Munn-Giddings C. A handbook for action research in health and social care. London: Routledge, 2001
53. Waterman H, Marshall M, Noble J, et al.. The role of action research in the investigation and diffusion of innovations in health care: the PRIDE project. Qualitative Health Research 2007;17:373-381.

54. Janesick, V. 'The Choreography of Qualitative Research: Minuets, Improvisations and Crystallization. In: Denzin NK, Lincoln YS. (Eds.). (2003). *Strategies of qualitative inquiry*. Thousand Oaks CA: Sage, 2003:46-79
55. Forman J, Damschroder L. *Qualitative content analysis. Empirical Research for Bioethics: A Primer*. Oxford, UK: Elsevier Publishing, 2008:39-62.
56. Kotter JP. *Leading Change: Create a vision and build coalitions to bring about change*. *Leadership Excellence* 2005;22 (11):5.
57. Batalden PB, Davidoff F. What is "quality improvement" and how can it transform healthcare?. *Quality and Safety in Health Care* 2007;16 (1):2-3.
58. De Luc K. Are different models of care pathways being developed? *International Journal Health Care Quality Assurance* 2000;13: 80–86.
59. Deneckere S, Vanhaecht K, Euwema M, et al.. The Relationship between Care pathways and Multidisciplinary Teamwork: a Systematic Review. *Social Science Medicine* 2012;75 (2): 264-268.
60. Vanhaecht K, Panella M, Van Zelm R, Sermeus W. An overview on the history and concept of care pathways as complex interventions. *International Journal of Care Pathways* 2010;14 ( 3):117-123.
61. Barbieri A, Vanhaecht K, Van Herck P, et al.. Effects of clinical pathways in the joint replacement: a meta-analysis. *BMC medicine* 2009;7 (1):32.
62. Waldman JD, Yourstone SA, Smith HL (2003). Learning curves in health care. *Health care management review* 2003;28 (1): 41-54.
63. Audimoolam S, Nair R, Gaikwad R, Qing C. The Role of Clinical Pathways in Improving Patient Outcomes. [http://www.academia.edu/6850634/The\\_Role\\_of\\_Clinical\\_Pathways\\_in\\_Improving\\_Patient\\_Outcomes](http://www.academia.edu/6850634/The_Role_of_Clinical_Pathways_in_Improving_Patient_Outcomes) Accessed February 13, 2015.
64. Susman GI, Evered RD. An assessment of the scientific merits of action research. *Administrative science quarterly* 1978;23:582-603.
65. Melrose MJ Maximizing the rigor of action research: Why would you want to? How could you?. *Field Methods*, 2001;13 (2):160-180.
66. McKay J, Marshall P. The dual imperatives of action research. *Information Technology & People* 2001;14 (1):46-59.
67. Stringer E. *Action Research-A Handbook for Practitioners* Sage Publications. Thousand Oaks, USA, 1996.
68. Panella M, Brambilla R, Marchisio S, Di Stanislao F. Reducing stroke in-hospital mortality: organized care is a complex intervention. *Stroke* 2008;39 (11): e186-e186.
69. Davidoff F, Batalden P, Stevens D, Ogrinc G, Mooney, S. Publication guidelines for quality improvement in health care: evolution of the SQUIRE project. *Quality and Safety in Health Care* 2008;17 (1):i3-i9.



# 8

## **Computer screen saver hand hygiene information curbs a negative trend in hand hygiene behavior**

*Onno Helder, Anne Marie Weggelaar, Daniël Waarsenburg, Caspar Looman, Johannes van Goudoever, Johannes Brug, René Kornelisse*

*Published as:*

*Helder OK, Weggelaar AM, Waarsenburg DC, Looman CW, Van Goudoever JB, Brug J, Kornelisse RF. Computer screen saver hand hygiene information curbs a negative trend in hand hygiene behavior. American Journal of Infection Control 2012;40 (10):951-954.*



## 8.1 Introduction

**Hospital-acquired infections** are associated with mortality and morbidity in neonatal intensive care unit (NICU) settings. The reported incidence of these infections varies between 11% and 53% <sup>[1-3]</sup>. Research shows that increasing compliance of healthcare workers (healthcare professionals) with **hand hygiene protocols** reduces these infections and limits the spread of pathogens <sup>[4]</sup>. Overall compliance with hand hygiene protocols in hospitals is low, however.

It has been shown that hand hygiene can be improved by strategies such as education, audits and feedback, environmental improvements, multimodal interventions, and reminders <sup>[4,5]</sup>. Improved hand hygiene compliance is known to reduce the rate of hospital-acquired bloodstream infections <sup>[1]</sup>. However, over time, a **washout effect** can be observed, in which the new behavior is not internalized, and participants relapse and return to their former automatic behavior, which includes insufficient hand hygiene <sup>[6]</sup>. Up to now, there has not been a proven optimal intervention that leads to lasting high compliance with hand hygiene measures. It is hypothesized that repeated attention is needed over a prolonged period to reduce the washout effect. Therefore, it is also important to address the subconscious, automatic behavior of healthcare professionals to maintain a high level of compliance with hand hygiene protocols.

Grol and Grimshaw showed that multiple interventions lead to a more sustained implementation of protocols by healthcare professionals <sup>[7]</sup>. Pittet et al. used different interventions, including poster campaigns, to promote hand hygiene; however, they did not provide any theoretical rationale behind their poster design <sup>[8]</sup>. Gain-framed messages not only provide recommendations, but also emphasize the advantages of hand hygiene, rather than the risk of noncompliance. A literature review suggested that posters with **gain-framed messages** are theoretically effective in motivating healthcare professionals hygienic behaviors <sup>[9]</sup>. Therefore, gain-framed messages may help promote hand hygiene in daily practice. The use of such gain-framed messages for improving hand hygiene has not been tested on hand hygiene practices in a real-life clinical setting, however <sup>[9]</sup>.

The purpose of this study was *to test the impact of gain-framed messages on the frequency of hand disinfection events and compliance in the NICU*. Hand disinfection events per complete day and shifts during the day, evening, and night shift were compared.

## 8.2 Methods

### 8.2.1 Design and Setting

We used an interrupted time series (ITS) design with objective measures of hand disinfection events. Two segmented periods of 8 weeks before the intervention and 8 weeks during the intervention were compared by an ITS to detect changes in the longitudinal trend in hand hygiene events associated with the introduction of the intervention. In addition, observations of hand hygiene behavior were systematically performed by research associates before and after the intervention. The study was conducted in a 27-bed, level IIID <sup>[10]</sup> **NICU at the Erasmus MC** – Sophia Children’s Hospital in Rotterdam, the Netherlands, between January 25, 2008 and May 25, 2008. A level IIID NICU center is equipped for all kinds of complex care for infants, including for example, care for extremely low birth weight infants (< 1000 g), extracorporeal membrane oxygenation, and surgical repair of complex congenital cardiac malformations. The NICU is divided into 3 identical subunits with 9 beds each. Approximately 750 newborns are admitted annually.

### 8.2.2 Study population

All NICU healthcare professionals who had physical contact with infants were included in the study. The healthcare professionals included 14 neonatologists, 8 residents, 105 nurses, 12 nursing assistants, and 4 nurse practitioners.

### 8.2.3 Intervention

As a substitute for static posters, we used a screen saver on computer displays placed in front of the desk as a communication vehicle. The computer screen saver is an efficient medium with which to communicate with employees and expose employees to hand hygiene promotion messages in a more dynamic way compared with the static medium of posters <sup>[11-13]</sup>. A total **6 computer screens, 2 per unit**, were involved. Computer screens were placed behind each desk of the 3 subunits, which were used by all healthcare professionals and were located in high traffic areas. The computers enter “sleep mode” 5 minutes after their last use, and the screen saver is automatically displayed on the monitor. The screen saver messages included a 2-screen series with different messages that

completed a cycle every 10 seconds<sup>[12]</sup>. The messages were replaced by a newly designed 2-screen series every 2 weeks, to maintain the attention of the staff and avoid desensitization to the messages<sup>[12,13]</sup>.

The screen saver messages emphasized the need for improved adherence to hand hygiene protocols and were designed according to theoretical principles of **message framing**<sup>[9]</sup>. Images of hands, germs, and disinfection methods were shown, and titles were designed to attract attention. We added gain-framed messages aimed at promoting hand hygiene, in which we focused on the benefits to the patients and on the responsibility of healthcare professionals to their patients and appealed to their instinctive altruistic motivation to “take good care” (example messages: “By performing appropriate hand disinfection, you maintain good health for the infants you are caring for;” “Don’t take it personally. Your hands look fantastic, but you should disinfect your hands to maintain good health for the patients and yourself”). We used images that were compatible with the message. No other interventions were performed to improve compliance with hand hygiene measures during the study period.

Five months before the initiation of the present study, a multidisciplinary infection prevention education programme was organized at our NICU. This programme reiterated general hygiene guidelines, encouraging healthcare professionals to culture all types of surfaces in the NICU to improve the awareness of invisible microorganisms, and reinforced the importance of appropriate hand hygiene.

#### **8.2.4 Data collection**

Electronic devices were used to objectively document the frequency of hand disinfection events. Wall-mounted bedside hand alcohol dispensers were replaced by identical dispensers with a **concealed electronic counter** and wireless transmitting equipment (ComSens, NewCompliance, Delft, the Netherlands). These electronic dispenser devices provided continuous documentation of hand disinfection events, including documentation of date and time of the individual dispenser usage. Each press of the lever generated a click of the sensor, and an additional click occurring within 2 seconds of the previous click was considered a single hand disinfection event<sup>[15]</sup>.

In addition, the compliance of healthcare professionals with hand hygiene protocols was evaluated during the final 2 weeks of the **observation period** before and after the intervention using a guided observation tool. Data from observations of healthcare professionals who performed rescue procedures or who were visiting from other units (and thus who could not be exposed to the screen savers during the intervention period) were excluded from the analyses of these observation data. Hand disinfection should be done before touching

a patient, before sterile procedures, before and after the use of gloves, after contact with body fluids, and after touching a patient. Failure to disinfect hands during any of these events was recorded as noncompliance. Washing the hands with soap and water is appropriate when hands are visibly soiled or after bodily fluid contact <sup>[16]</sup>. Two medical students performed observations; the healthcare professionals were unaware of the reason for the observations. Healthcare professionals are frequently observed for training as well as research purposes, and thus are used to these practices, reducing the risk of the Hawthorne effect (a usually positive short-term effect on the dependent variable caused by subjects' awareness that they are under study). The observers were not blinded to the intervention.

Along with compliance with hand disinfection protocols, we also documented the nature of the procedure (elective or rescue). Before study commencement, interobserver reliability was assessed using Cohen's  $\kappa$ . The mean  $\kappa$  was  $> 0.8$ , indicating good agreement. The following potential **confounding factors** were documented: birth weight, gestational age, and Clinical Risk Index for Babies (CRIB) score <sup>[17]</sup>.

For analysis, the day shift was defined as 8:00 AM to 4:00 PM, the evening shift as 4:00 PM to 11:00 PM, and the night shift as 11:00 PM to 8:00 AM.

### 8.2.5 Power analysis

We previously measured the mean (SD) number of hand disinfection events per week as  $5750 \pm 450$ . A power analysis showed that an increase of 675 hand hygiene disinfection events per week can be significantly detected with 80% power and a 2-sided 5% significance level. We previously showed a baseline compliance with hand hygiene of 65%, which improved after intervention to 88%. Therefore, we considered a target compliance of 80% to be realistic <sup>[1]</sup>. Given the target improvement in compliance rate from 65% to 80%, we found that 135 observations in each observation period were needed to detect a significant difference with 80% power and a 2-sided 5% significance level.

### 8.2.6 Statistical analysis

We evaluated the effect of the intervention on hand disinfection practices with a segmented linear regression analysis of interrupted time series data, dividing the time series into a pretest segment and a posttest segment. We aggregated hand disinfection events over a 1-week period to determine the longitudinal effects

and avoid autocorrelation. Hand disinfection events are influenced predominantly by the number of patient days; thus, we adjusted the number of hand hygiene events by dividing by the number of patient days. The data are expressed as median and interquartile range (IQR) unless indicated otherwise.

For the additional observations, data on compliance with hand hygiene are expressed as a percentage of all events that necessitate hand hygiene procedures. Univariate analyses using the  $\chi^2$  test were performed for a simple pretest-posttest comparison. P values < 0.05 were considered statistically significant. SPSS version 17 (Chicago, IL, USA) was used for data analysis.

### **8.2.7 Ethical considerations**

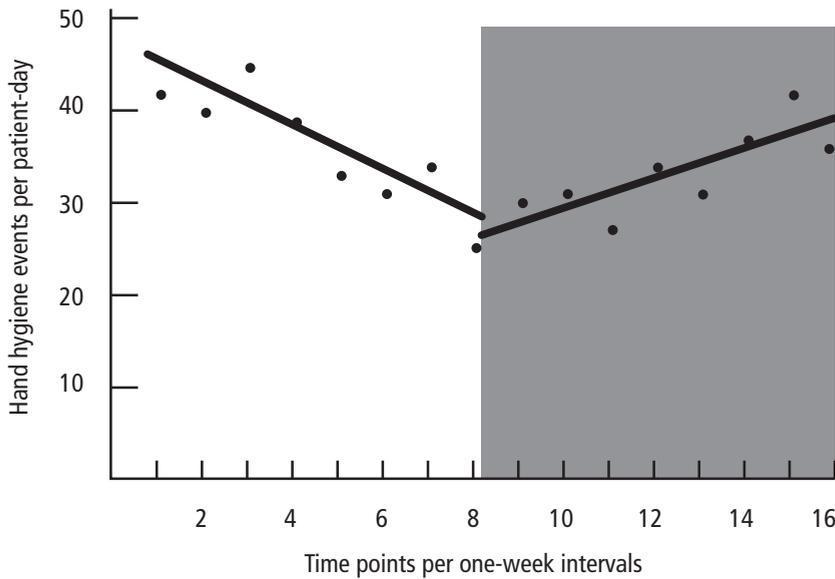
The Erasmus Medical Center's Institutional Review Board approved the study. Because of the study's observational nature, the need for informed consent from the parents was waived.

## **8.3 Findings**

The patient characteristics during the pre-intervention period (N=125) and post-intervention period (N=144) were well balanced. The median (IQR) birth weight was 1980 g (1367-3170 g) versus 1810 g (1177-2956 g) (P = 0.14); mean gestational age was 34 weeks (31-38 weeks) versus 33 weeks (28-37 weeks) (P = 0.33); and mean CRIB score was 1 (0-2) vs. 1 (0-3) (P = 0.99).

The daily median number of hand hygiene events during the 4-month study period was 792 (705-930), with a pre-intervention value of 804 (686-940) and a post-intervention value of 783 (726-899). The plotted interrupted time series data showed a clear change from a negative trend towards fewer hand hygiene events before the intervention to a positive trend after the intervention was introduced (see figure 8.1). The trend shows predicted volumes from the segmented linear regression analyses. The hatched area indicates the period from which the screen savers were introduced.

Table 8.1 presents the separate analyses of all shifts combined and specific shifts, showing similar results for the different shifts separately and all shifts combined. The number of hand disinfection events per patient-day before the intervention decreased by 2.4 (standard error [SE], 0.5) per week (P=0.001) per patient day.



**Figure 8.1** Time series of the aggregated hand hygiene events per patient day over 1-week intervals

The immediate effect of the screen saver after its introduction was not significant (-1.4 [3.3];  $P=0.681$ ). The posttest trend showed a **significant increase** of 1.5 (0.5) hand disinfection events per week per patient-day ( $P=0.001$ ). The change in trend before and after the intervention was highly significant.

A total of 677 observations were performed before and after the intervention was started. After excluding 51 rescue healthcare professionals and 46 visiting healthcare professionals, 584 observations were analysed, including 303 observations before the intervention and 281 after starting the intervention. The compliance with hand hygiene protocols before patient contact showed a relative increase of 12.4%, from 63.6% (193 of 303 events for which the protocol required hand hygiene procedures) before the intervention to 71.5% (201 of 281) after the intervention ( $P=0.05$ ).

**Table 8.1** Distribution of hand disinfection events per healthcare worker over the different shifts

Shift	Median (Interquartile range) hand disinfection events per healthcare worker
Day shift	13.9 (10.8-16.7)
Evening shift	19.8 (16.3-24.1)
Night shift	16.6 (14.2-19.3)
Total day	15.9 (13.1-19.3)

## 8.4 Discussion

The present study provides evidence, based on objectively measured hand hygiene events, that **gain-framed screen saver messages** designed to improve compliance with hand hygiene protocols may have beneficial effects on the frequency of hand hygiene events. The introduction of the screen saver messages was associated with a change from a negative to a positive trend. This change was observed for all shifts combined as well as for the day and evening shifts separately, but it was not significant for the night shift. Additional evidence indicating that the screen savers improved hand hygiene compliance was obtained from direct and systematic observations.

Before the screen savers were introduced, a negative trend toward fewer hand hygiene events was seen in our unit. Various interventions have been implemented in efforts to improve hand hygiene, and the negative trend may be due to a **washout effect** of such earlier interventions. This may indicate that hand hygiene promotion requires continuous efforts. The fact that health education intervention might not have long-lasting effects has been observed for a range of health behaviors <sup>[6,18]</sup>.

During the intervention period, a clear shift in trend was observed, with an increased number of hand disinfection events per patient-day. This positive trend was more pronounced for the day and evening shifts compared with the night shift. Earlier research has indicated that hand hygiene compliance is generally lower during night shift, possibly related to less peer pressure to perform appropriate hand hygiene <sup>[19]</sup>.

The additional observations indicate that before the intervention, health-care professionals on the unit were compliant with hand hygiene procedures for 63.6% of the relevant events. Previous research reported compliance rates of 23%-44% by direct observations in NICU settings, but the relatively high compliance rate at baseline in the present study is in line with earlier observations in our NICU in 2005 <sup>[1]</sup>. The observations after introduction of the screen savers indicated that hand hygiene compliance increased to 71.5%. These observational data support the time series results, but should be interpreted with more caution given the simple pretest-posttest comparison used. Although > 70% observed compliance is certainly high compared with other studies <sup>[20]</sup>, it still represents an unacceptably high number of potentially dangerous opportunities for the spread of pathogens among patients during planned patient contacts <sup>[18]</sup>.

Message framing for encouraging disease prevention behavior has been well studied. A meta-analytical review in 2007 found 93 studies and concluded that gain-framed messages are more persuasive in encouraging prevention behavior compared with loss-framed appeals <sup>[14]</sup>. Because we did not compare gain-framed

messages with other messages, we cannot conclude that gain-framed messages are superior in improving hand hygiene compliance. The electronic device could be used in a study comparing different message strategies.

To the best of our knowledge, 3 previous studies have used screen savers to change behavior or for educational purposes<sup>[11-13]</sup>, but only one of these studies evaluated the effects<sup>[13]</sup>. It is unclear how screen saver health education can best be applied in terms of, for example, exposure time, replacement schedule, and screen design<sup>[11,12]</sup>. We chose to change the screen saver messages and pictures after 10 seconds, which appeared to be long enough for healthcare professionals to read the message when they walked past the screen saver, but short enough to avoid boredom. New screen saver messages were introduced after 2 weeks, similar to the earlier examples<sup>[11,12]</sup>. Further research could focus on varying exposure time, replacements and screen designs to inform further improvements of screen saver education.

This study had some potential limitations. The data collection period was relatively short, given that the linear trends both before and after the intervention must flatten or reverse at some point. We may overcome this problem in future studies by collecting data for a longer period until a reverse point is obtained. Another limitation was the interrupted time series design study without a control group, which precludes us from ruling out any effects of unknown confounding factors. However, a randomized controlled trial is not feasible for evaluation health education interventions via public announcements and messages. We considered a 'community' intervention trial in which units were randomly allocated to receive the intervention or not, but there are insufficient units of similar size and focus in the Netherlands for conducting such a study. An interrupted time series design was our best option. We presume that the observed beneficial shift in trend of hand hygiene events might have been caused by the intervention with gain-framed messages.

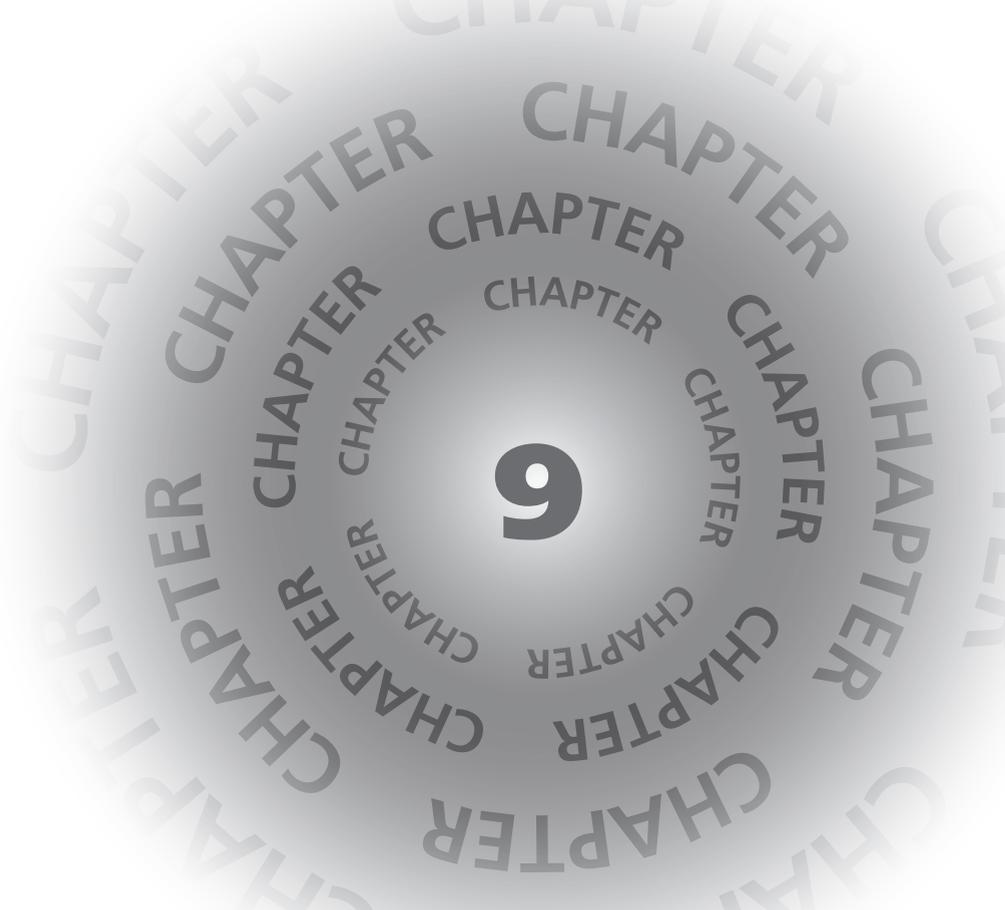
## Acknowledgement

We thank Joyce van der Weijde for assisting with data collection and Janine Pijls for developing a data extraction programme.

## References

1. Helder OK, Brug J, Looman CW, et al. The impact of an education program on hand hygiene compliance and nosocomial infection incidence in an urban neonatal intensive care unit: an intervention study with before and after comparison. *Int J Nurs Stud* 2010;47 (10):1245-52.
2. Ng PC, Wong HL, Lyon DJ, et al. Combined use of alcohol hand rub and gloves reduces the incidence of late onset infection in very low birthweight infants. *Arch Dis Child* 2004;89:336-340.
3. Aziz K, McMillan DD, Andrews W, et al. Variations in rates of nosocomial infection among Canadian neonatal intensive care units may be practice-related. *BMC Pediatrics* 2005;5:22.
4. Hautemaniere A, Cunat L, Diguio N, et al. Factors determining poor practice in alcoholic gel hand rub technique in hospital workers. *J Infect Public Health* 2010;3:25-34.
5. Raleigh VS, Hussey D, Seccombe I, Qi R. Do associations between staff and inpatient feedback have the potential for improving patient experience? An analysis of surveys in NHS acute trusts in England. *Qual Saf Health Care* 2009;18:347-54.
6. Salemi C, Canola MT, Eck EK. Hand washing and physicians: how to get them together. *Infect Control Hosp Epidemiol* 2002;23:32-5.
7. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 2003;362:1225-1230.
8. Pittet D, Hugonnet S, Harbarth S, et al. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *Infection Control Programme. Lancet* 2000;356:1307-1312.
9. Jenner EA, Jones F, Fletcher BC, et al. Hand hygiene posters: motivators or mixed messages? *Journal of Hosp Infect* 2005;60:218-225.
10. Stark AR, American Academy of Pediatrics Committee on Fetus and Newborn: Levels of neonatal care. *Pediatrics* 2004;114:1314-1347.
11. Anderson D, Dobson N, Lewandowski J. Using computer screen savers to enhance nurses learning in the intensive care environment. *Dimens Crit Care Nurs* 2007;26:160-2.
12. Steele AW, Barrow B, Veltri G, et al. Screen-saver technology: an easy way to enhance communication with employees. *Jt Comm J Qual Patient Saf* 2005;31:708-11.
13. Filoromo C, Macrina D, Pryor E, et al. An innovative approach to training hospital-based clinicians for bioterrorist attacks. *Am J Infect Control* 2003;31:511-4.
14. Boyce JM, Cooper T, Dolan MJ. Evaluation of an electronic device for real-time measurement of alcohol-based hand rub use. *Infect Control Hosp Epidemiol* 2009;30:1090-5.
15. Pittet D, Allegranzi B, Sax H, et al. Evidence-based model for hand transmission during patient care and the role of improved practices. *Lancet Infect Dis* 2006;6:641-52.
16. The CRIB (clinical risk index for babies) score: a tool for assessing initial neonatal risk and comparing performance of neonatal intensive care units. The International Neonatal Network. *Lancet* 1993;342:193-8.

17. Helder OK, Latour JM. Undergraduate nurse students' education in infection prevention: is it effective to change the attitude and compliance with hand hygiene? *Nurs Crit Care* 2010;15:39-40.
18. Earl ML, Jackson MM, Rickman LS. Improved rates of compliance with hand antisepsis guidelines: a three-phase observational study. *Am J Nurs* 2001;101:26-33.
19. Hoogen A van den, Brouwer AJ, Verboon-Maciolek MA, et al. Improvement of Adherence to Hand Hygiene Practice Using a Multimodal Intervention Program in a Neonatal Intensive Care. *J Nurs Care Qual* 2011;26 (1):22-29.
20. Lam BC, Lee J, Lau YL. Hand hygiene practices in a neonatal intensive care unit: a multimodal intervention and impact on nosocomial infection. *Pediatrics* 2004;114:565-71.
21. Brown SM, Lubimova AV, Khrustalyeva NM, et al. Use of an alcohol-based hand rub and quality improvement interventions to improve hand hygiene in a Russian neonatal intensive care unit. *Infect Control Hosp Epidemiol* 2003;24:172-179.
22. O'Keefe DJ, Jensen JD. The relative persuasiveness of gain-framed and loss-framed messages for encouraging disease prevention behaviors: a meta-analytic review. *J Health Commun* 2007;12:623-644.



# 9

## **Reducing Healthcare associated infections: lessons learnt across European hospitals**

*Hester van de Bovenkamp, Anne Marie Weggelaar-Jansen, Julia Quartz,  
Susan Burnett, Sara Gomes, Anette Karlton, Anna Renz, Siri Wiig,  
Naomi Fulop, Roland Bal*



## 9.1 Introduction

Healthcare acquired infections (HCAI) are a persistent problem that poses discomfort, pain, health threats and risk of mortality to patients <sup>[1]</sup>. Moreover, HCAs result in increased costs for the healthcare system and the wider economy <sup>[2,3]</sup>. Many countries within the EU have initiated policies to reduce HCAI. The EU itself has also put quality of care, including reduction of HCAI, on its agenda <sup>[4]</sup>. In the EU's Recommendation on patient safety <sup>[5]</sup>, Member States are, amongst others, asked to share best practices and adopt and implement a strategy for the prevention and control of HCAI.

The causes of HCAI <sup>[6]</sup> and a large range of interventions to reduce HCAs have been described in literature <sup>[3,7]</sup>. Despite this knowledge, research shows that HCAs are a persistent problem <sup>[6,8]</sup> and the dissemination of best practices is not easy <sup>[9]</sup>. Hospital contexts may partly explain why this is the case, as these contexts influence local definitions of patient safety and the way quality and safety work is governed <sup>[10]</sup>. This results in diverse ways for quality improvement (QI) work <sup>[11]</sup>, which poses difficulties for cross-hospital and cross-country learning.

This paper is based on a **multi-level qualitative study in five European countries** which allows a deeper understanding of how HCAI control work is performed in hospitals. Based on this cross-country study we analyse QI processes in relation to HCAI control and prevention, focusing on the question: how hospitals across European countries work on reducing HCAI and what this means for the possibility of cross-country learning and the role of the EU.

## 9.2 Research methods

This research is part of the EU FP7 project Quality and Safety in European Union Hospitals (**QUASER**), a qualitative multi-level longitudinal comparative case study in five countries: England, Portugal, Norway, Sweden and the Netherlands (see QUASER study protocol <sup>[12]</sup> for detailed information about design, methods, procedures, and analysis). The countries involved were chosen because they represent variation in important aspects of healthcare systems, such as funding, regulation and methods used to steer QI. In each country two hospitals (total of 10) at different stages of their 'quality journey' were studied. Hospitals were selected and approached according to an agreed hospital selection framework

based on their performance on quality indicators (see Burnett et al <sup>[13]</sup> for detailed information about the hospital selection framework, criteria, rationale, and process).

The aim of QUASER was to create an understanding of hospitals' QI effort and the kind of processes that enable to achieve QI results <sup>[12]</sup>. Therefore, we performed qualitative research on QI work in hospitals, using a range of data collection methods. Part of the QUASER research was to study in-depth a QI project on HCAI in each country. The importance of such studies is gaining emphasis in the literature <sup>[14]</sup>. This paper reports a subset of the larger QUASER study, presenting the findings of the HCAI QI project which reflects one of the main research questions of QUASER focusing on: how QI work can be supported. Guiding the QUASER study was the 'Organizing for Quality Framework' <sup>[11]</sup> in which six challenges for QI were identified: structural, cultural, emotional, political, educational, and technological. To which we added, based on a literature review, leadership and external demands. These eight challenges formed the framework for our data collection and analysis.

If required, ethical approval was granted in each country and consent obtained from the involved informants. The following institutions approved the project: Norwegian Social Science Data Services, ref. 26636 (Norway); Regional Ethical Committee, Lindköping, ref. 2011/164-31 (Sweden); and NRES Committee South East Coast, Surrey, ref. 11/L010348 (England). Ethical permission for this study was not necessary under Dutch and Portuguese law as no patient data was collected. In the Portuguese and Dutch hospitals, the board of directors authorized the collection of data, and the ethics committee was informed of the study.

### 9.2.1 Data collection

Since national contexts influence QI work in hospitals <sup>[10]</sup>, a first step in the QUASER study was to explore the national context in terms of dominant governance modes. This was studied through a document analysis and approximately 100 semi-structured interviews with actors playing an important role in the governance of quality in each country, such as professional organizations, knowledge centres, payers organizations, regulators, patient representative organizations, governmental agencies and leading hospital CEO's. Interviews and document analysis for this part of the study was performed in the Winter of 2010.

Next, ten hospital case studies (2 in each country) were conducted over a 12 month period (April 2011 to April 2012). They consisted of in-depth qualitative

study of the hospitals' QI attempts <sup>[12]</sup>. In five of these hospitals (one in each country) nested case studies of HCAI control or prevention were performed. **Case studies** are particularly useful in addressing 'how' and 'why' questions and therefore provide deeper insights on QI work, although case studies are relatively under-utilised in the study of QI <sup>[14]</sup>. Cross-case, comparative analysis, particularly across very different contexts, is especially valuable in exploring similarities, commonalities and differences, thereby strengthening explanatory power <sup>[15]</sup>. The purpose of these nested case studies was to follow real time HCAI work as exemplars of QI work. These nested cases were selected in consultation with the CEO's and leading clinicians and were based on the same three considerations in each hospital:

1. An important HCAI improvement topic in the hospital by the start of the QUASER study
2. Their impact on the QI agenda
3. Being a good example of normal routines in QI (project) work in the hospital.

We used a range of qualitative methods to study HCAI work (see table 9.1). A protocol was used, based on our framework with eight challenges <sup>[11]</sup>, for the data collection in the five nested case studies. First, in each country one researcher conducted semi-structured interviews with key-players involved in prevention and control of HCAI, such as infection prevention nurses, medical micro biologists, senior management, clinical staff (doctors and nurses), and (management of) cleaning staff. All interviews were conducted and transcribed in the native language of the country studied. Second, observations of daily practice were conducted, with the exception of the Portuguese case, in which getting permission to conduct observations was not granted. In the remaining four countries we observed the decision-making processes at staff, management and project meetings, and daily hospital ward routines to explore how

**Table 9.1** Summary of the research methods in the five countries

Research methods	England	Norway	Sweden	Portugal	Nether-lands	Total
Semi-structured interviews	5	6	9	11	15	43
Observation of daily practices (hours)	10	7	12	0	31	60
Observation of meetings (hours)	3	2	5	0	7	17

HCAI discussions and QI operate in daily practice. Field notes were taken during these observations, focusing on providing rich insight into the hospitals QI work. Third, we performed a document study to gain insight in the interaction between different levels (ward, healthcare organization, regional, nations) in their support and steering of HCAI QI work. Hospital documents (policies, protocols, posters, presentations, training material, letters, minutes, etc.) and documents of regional and national bodies on HCAI (e.g. policies, guidelines, guides) were studied.

### 9.2.2 Data analysis

In the QUASER study we used a preliminary theoretical framework <sup>[16]</sup> based on the eight challenges approach to analysis, rather than a purely grounded theory <sup>[17]</sup> approach. Therefore, data analysis was a combination of induction (data-driven generalisation) and deduction (theory-driven exploration of hypotheses) <sup>[18,19]</sup>. The data analysis consisted of a two-step process. First, a within country analysis of the country specific data collected by the country research teams. Second, a cross country meta-synthesis analysis in which a comparison was made between the five countries <sup>[15]</sup>.

For the first step, interviews, observation notes and documents were analysed by the country teams according to an upfront agreed code-book based on the eight challenges of our framework. Preliminary analysis and emerging themes were discussed in researcher meetings and QUASER consortium meetings with all partners face-to-face. Based on this analysis the research teams in each country produced a '**country report**' written in English, using a standardized template. Quotes from the interviews and extracts from the observations were included in these reports. The country reports included a specific chapter about the HCAI nested case studies. Country analyses were discussed in researcher meetings and QUASER consortium meetings with all partners face-to-face.

The second step involved a **qualitative meta-synthesis** <sup>[20]</sup>; which is a qualitative study using the findings from other qualitative studies (the chapters of the country reports) as data, linked by the same or a related topic <sup>[21,22]</sup>. For this paper the nested HCAI cases were used. The chapters were analysed independently by three researchers [HvbB, AMW, JQ], in order to learn more about how hospitals work on reducing HCAI <sup>[21]</sup>. We **inductively coded** the chapters to identify key QI mechanisms for HCAI prevention. This way we could explore patterns across the five different HCAI QI projects and compare differences and similarities of HCAI related QI work. During this analysis we specifically focused on the possibilities for cross-country learning. Our findings were presented face-to-face and discussed with the other QUASER researchers who conducted the HCAI case studies for

a member check. The writing process of the article was an iterative one: the QUASER researchers commented on our analysis and several drafts of the article included refinements. This way the robustness of our analysis was ensured.

## 9.3 Findings

In this paragraph an analysis of the national contexts of QI is presented followed by a description of the cases. After this we focus on three key QI mechanisms relating to HCAI across the nested case studies.

### 9.3.1 National Context

In order to understand the cases, we briefly summarise the national contexts in relation to QI work. Based on our macro level study, we conclude that countries differ in terms of dominant governance modes that are used to steer hospitals on the subject of quality and safety. England can be described as a centralized system with a strong focus on top-down hierarchal steering as the driver of quality in hospitals. National government and national quality centres play an important role in setting the agenda for QI. Both Sweden and Norway can be characterized as more consensus-based systems where decisions concerning quality are mostly made at the regional or local level with much room for building consensus between the parties involved. Here regional governments and disease-based registries play an important role. In Portugal improvement work is based on self-regulation with much room for bottom up initiatives of professionals. For the Netherlands QI steering can be described as a market-based system, in which many actors, both public and private, play a role in guiding QI. Despite these differences in governance modes we see that HCAI is a focus of attention at the national and hospital level. The national contexts for QI of HCAI are summarized in table 9.2.

### 9.3.2 Description of HCAI cases

The **English** case concerned a large-scale coordinated infection control programme responding to national initiatives <sup>[22]</sup>. It consisted of standardized measures, mandatory surveillance of certain infections, the implementation of evidence based medicine (EBM) guidelines published by the English National

**Table 9.2** National contexts of quality improvement

	QI governance mode	Actors playing an important role in QI	HCAI control or prevention QI work
Sweden	Consensus based	Regional government, local hospitals	Focus on prevention of antibiotic resistant bacteria as a result of initiatives driven by a national voluntary network established in 2010 supported by a national council
England	Centralised/top down/hierarchical	National government, National knowledge and improvement centres	The reduction of HCAs has been at the forefront of national safety initiatives for the last ten years. All trusts in England are heavily influenced by the macro level context in their actions surrounding infection control
Portugal	Bottom up/self-regulation	Professionals	The Ministry of Health recognized that nosocomial infections are a major national problem. In 2008, a national strategy, based on WHO initiatives, was developed aiming to reduce the incidence of these infections
Norway	Consensus based	Regional government, local hospitals	The HCAI control regime is based on enforced self-regulation and internal control. The Ministry of Health and Care Services initiated the start of a national patient safety campaign
The Netherlands	Market based	Public/private mix of players	Attention for some aspects of HCAI is part of the national patient safety programme. In addition, much work on the national level is done in the Workgroup for Infection Prevention which develops and publishes evidence based guidelines which are used by hospitals and the Healthcare Inspectorate.

Institute for Health and Care Excellence (NICE) and a national improvement programme ('Saving Lives'). In addition, individual hospital targets to reduce specific HCAs are set by the national government. Hospitals have to report on these on a monthly basis and the results are in the public domain.

The **Portuguese** HCAI focused, in line with national policy, on hand hygiene, which is widely considered as one of the most important infection prevention measures [7,9,23]. The national government promoted the programme and translated the WHO norms and implementation guides into Portuguese. The strategy for implementing the programme followed guidelines issued by the World Alliance for Patient Safety. Attempts were made to implement the programme in all hospitals, including the hospital studied.

The **Norwegian** case partly resulted from the national patient safety campaign. One of the themes was safe surgery, with a focus on the prevention of post-operative infections. The Women's Clinic was invited to take part in a pilot programme. At the time, the hospital was already implementing the WHO safe surgery checklist. The hospital merged the patient safety campaign and the safe surgery pilot into the on-going QI work within the region.

**Table 9.3** HCAI cases

Country	Hospital	HCAI project	Main drivers
England	Non-teaching hospital Number of beds: 1.025 Number of staff: 7.500	Large scale coordinated infection control programme	National initiatives
Portugal	Teaching hospital Number of beds: 1.300 Number of staff: 15.468	Hand hygiene	National initiative based on WHO norms
Norway	Teaching hospital Number of beds: 1.100 Number of staff: 11.000	Safe surgery	National patient safety campaign and WHO checklist
The Netherlands	Teaching hospital Number of beds: 536 Number of staff: 2.649	Hand hygiene	HCAI outbreak receiving media attention and supervision of the healthcare inspectorate
Sweden	Non-teaching hospital Number of beds: 506 Number of staff: 3.300	Prevention of antibiotic resistant bacteria	Local initiative in response to national programme.

The **Dutch** case focused on hand hygiene in a neonatal department. In this department there was an outbreak of a HCAI resulting in severe problems for several neonates. The outbreak received attention in the media and put the hospital under intensified supervision of the Healthcare Inspectorate. A wide variety of measures were taken to work on hand hygiene and HCAI.

The **Swedish** focused on the prevention of antibiotic resistant bacteria reflecting the importance of linking HCAI to the prudent use of antibiotics <sup>[24]</sup>. This shows that HCAI is not only important for the current patient population but is a matter of public health as well. The chief physician of the Department of Infectious Diseases in the hospital took the initiative, with the support of the County Council Director, to start a hospital project group in response to national initiatives.

A summary of the HCAI cases and a description of the hospitals can be found in table 9.3. We now turn to the QI mechanisms we found across the five hospitals.

### **9.3.3 Feedback mechanisms and the importance of visualization to change or reinforce behaviour: making the invisible visible.**

The analysis shows that feedback mechanisms and especially visualization are important in HCAI control. Although we found that there is much emphasis on quantitative data on HCAI control, our data also show the added value of qualitative data in providing feedback. An example of this was found in the Norwegian case where mini-audits were used. In these mini audits two project managers carried out 15-minute interviews and observations of daily practice on hospital wards. The aim was to mirror gaps between theory and practice without judging professionals and enabling managers to identify points for improvement without losing face.

*“Instead of the traditional approach where you conduct the analysis and suggest improvement measures, we just hand over the status of our study to the managers and leave the process of finding and implementing improvement measures up to them. We just state that there is a gap between theory and practice. By using this methodological approach we are able to provide feedback to the leaders in a safe and informal way” (Manager Norway).*

As the link between HCAI (let alone the overuse of antibiotics) and behaviour of healthcare workers is often indirect or remains invisible, we found that hospitals invested much in technologies of visualization. The results suggest that lack of

feedback leads to professionals not relating the appearance and consequences of HCAI to their own behaviour.

*“Problems are like elephants, and these infections are like invisible elephants. For doctors the problem is if you can’t see it, it does not exist.”* (link nurse Portugal)

To remedy this problem, hospitals use a number of visualization techniques to get HCAI on the radar of the professionals such as: making photos of risky places, screen savers, posters and intranet messages to get attention, organizing an information and education week, and checking the hands of staff under blue fluorescent light.

In order to steer QI work, the presentation of performance data with graphs (bars, spreadsheets, cartoons) is also used to visualize the problem and to show change over time. Most hospitals build technological infrastructures to collect, analyse and present performance data.

*“The E-portal will gather different information from the data log system which will then pop up in tables and bar charts as the clinics should be able to use the data in their continuous improvement work and see that ‘now the prescription of Ciproxin has gone down and we want it to do so (...) now we have more Clostridium and we do not want that (...)’ By getting more frequent data you can control the business better.”* (Sweden infection coordinator)

Other examples of visualization techniques that hospitals used include a dashboard to present data with run charts or traffic lights (green, orange, red) which gives insight in the gap between the current and desired situation. Such visualizations give nurses knowledge to provide feedback to doctors and start a dialogue about infection control. Using knowledge about performance based on this data worked as a tool to both visualize and objectify. These visualization practices also provide a way to deal with hierarchical relationships in hospitals.

### **9.3.4 Increasing knowledge about HCAI and quality improvement**

Evidence based knowledge and guidelines play an important role in HCAI QI work. Guidelines often come about through national organizations (e.g. NICE in England, Norwegian Institute of Public Health, General Directorate of Health in Portugal), working groups (e.g. Dutch workgroup Infection Prevention guidelines) or professional bodies (e.g. Dutch association for medical microbiology).

International guidelines are used as well (e.g. WHO guidelines in the Portuguese and Norwegian case). In addition, knowledge about QI methods is needed. This knowledge is sometimes part of the dissemination strategy of the national organizations and workgroups. Sometimes providing help with QI tools is also done by local non-profit organizations (e.g. Qulturum in Sweden) or part of consultancy markets (particularly in the Netherlands).

All HCAI case studies used interventions such as educational strategies (training, clinical lessons, e-learning) information strategies (meetings, newsletters, intranet messages), patient strategies (having patients check hand washing) and also more 'fun' initiatives (playing a game to reveal bad hygiene behaviour). As stated in the Introduction, single interventions often do not lead to sustainable improvement. Translation of knowledge to the local context and combining interventions might remedy this problem.

Our results suggest that national and international guidelines and QI guides cannot directly be implemented in hospitals, but need to be adapted and translated in order to fit the local context. In the Dutch case for instance, national evidence based guidelines were translated into local protocols and checklists. In the English case, where QI relies on meeting NHS targets, the hospital translates the targets to the ward level.

*"(...) in the past we've always just had an organizational objective around Infection Control (...), very much the Infection Control team owned it ... This coming year for the first time we are setting objectives for each of the divisions now and for each of the clinical units."*  
(infection control nurse England)

Again, the importance of qualitative information in QI should be noted. In the Swedish case for instance case histories of patients are used as narratives to emphasize the problem, thereby trying to mobilize staff to work on antibiotics use. Norwegian respondents found the lack of more in-depth information problematic in some cases. For example, respondents argue that the Norwegian Knowledge Centre for the Health Services is only interested in the percentage where the safe surgery checklist is used before, during and after surgery. The respondents feel the context of use (e.g. emergencies) when only parts of the checklist are completed are interesting as well. Qualitative information about why the checklist is not used is also considered useful to them.

### 9.3.5 Brokering: interaction between levels, professions and wards

In order to translate initiatives to local contexts, links need to be established between levels, professions, wards and hospitals. Brokering was found to be a crucial mechanism to adapt and localize QI related knowledge and ideas. For example, the Portuguese case showed how a national programme was not implemented properly due to lack of commitment of the hospital board. National programmes, then, should engage hospital leaders into the development of national (HCAI) programmes in order to attune programmes and local demands.

Further, brokering facilitates interactions between professions. HCAI is a typical subject in healthcare that only functions if people from different professional backgrounds collaborate. Particularly cooperation of doctors is very important for success. The Portuguese case shows that in instances where strong links exist between doctors, nurses and the infection control committee (ICC) on a certain ward, implementation of the project happened much more successfully than in cases where such links were absent. Departments where good communication between nurses and doctors existed reported successful results.

In all cases, brokering was given a place in the organizational structure by appointing 'link-nurses' or 'healthcare developers'. They make sure that the subject receives the attention from their colleagues, for instance by performing audits. Moreover, they share their experiences at meetings of link nurses of different wards, thereby enabling cross-ward learning. The HCAI cases studied show that it is important to continuously provide information and education. In the Norwegian case 'link nurses' keep reminding managers and professionals to work on the subject by recognizing the importance of being 'a bit of a nag.' Collaboration also requires understanding of each other's expertise. Creating spaces where this understanding is produced is important for the work in daily practice. As an infection prevention nurse from the Netherlands argues:

*"It's now easier to ask for advice when I have questions. When I get results of a culture of which I think is this right? Now I will call immediately. Before I thought they would call me if something were wrong."*  
(nurse, the Netherlands)

Brokering can help to translate between different forms of expertise, which again enables professionals to learn from each other and create a mutual understanding about HCAI control, prevention and QI.

It is important to note that brokering not only happens through organizing formal structures such as meetings but also through informal work. The English case

shows an example of this. In this hospital meetings organized by the infection control team were seen as necessary for improvement work. However, they were often cancelled or cut short when key people were not able to attend, rendering them useless. Therefore the team reverted to more informal linking work, talking to people over the phone or just when they met them around the hospital.

## 9.4 Discussion

Previous studies emphasise the importance of national, local and organizational hospital contexts in determining solutions that work for a particular hospital [11,16,25,27]. The added value of our study is that we focused on the underlying mechanisms that can be found in all countries studied, despite differences in national context. This does not mean that these contexts are not relevant. Instead of providing a 'one size fits all' approach to HCAI QI work which disregards context, rather our results provide lessons about the important (context) mechanisms that need to be in place.

Countries differ in the dominant governance modes used to steer and influence QI work in hospitals (see table 9.2) [4]. For instance, the opportunities hospitals have to determine priorities and the methods for QI work differs. This heterogeneous QI work is also reflected in the inventory on the implementation of the recommendation on patient safety made by the European Commission [24] and is identified in earlier comparative studies [27]. It is important to take these national, hospital and even ward differences into account, since what people consider acceptable ways of steering, will partly determine their willingness to work on a certain subject with a specific QI method. The HCAI projects studied clearly show the importance of adapting QI initiatives to the local hospital and ward context.

Despite these differences in contexts, the HCAI projects studied indicate that the mechanisms identified for QI are quite similar across hospitals in different countries. They point to the importance of behavioural change to improve healthcare, a subject which is gaining increasing attention in literature [29,30]. Feedback mechanisms, especially visualization of the problem and performance is important, as is evidence based knowledge. The latter is often the starting point of HCAI work, but needs translation to the local context of the hospital. Creating local knowledge about the hospitals' performance is also important; our research shows the relevance of quantitative and qualitative information for this. In order for translation to work, formal and informal links need to be es-

established between the different levels, professions, wards and hospitals. Some of the reported mechanisms seem independent of the dominant governance structure and partly accommodate the differences in this structure; underpinning reported successful interventions in the literature <sup>[7,9,23]</sup>.

These results have implications for **the role the EU** can play in reducing HCAI across nations. We identified similar mechanisms and therefore we conclude that hospitals can learn from each other. The inventory on the implementation of the recommendation on patient safety <sup>[15]</sup> showed that in some countries this recommendation triggered initiatives to work on HCAI prevention. Moreover, a majority of countries expressed the need for guides on how to work on patient safety topics based on standards <sup>[24]</sup>. The mechanisms we identified could serve as input for such guides. In addition, the research methods used to discover these mechanisms can be replicated to reveal more supporting mechanisms. Our results show that it is crucial to develop policies that allow room for learning processes across countries. Learning is not likely to occur by strict convergence of policies and interventions, but rather by translation of the underlying mechanisms for successful QI to the national healthcare system and the local context of a hospital.

This study has some limitations. First, access to respondents and observation opportunities differed between countries causing differences in (the amount of) data. Second, we did not include patients as respondents in our study. Future studies should include the patient perspectives on QI <sup>[30]</sup>.

## Acknowledgement

The authors wish to thank the European Commission for funding this research, and all those who supported and guided this work both within the QUASER research project team and as external associates. In particular we would like to thank all the respondents in the five countries as well as the members of the stakeholder and expert advisory group of the QUASER project for their contribution.

## References

1. McKibben L, Horan T, Tokars J, et al. The Healthcare Infection Control Practices Advisory Committee, Guidance on Public Reporting of Healthcare Associated Infections: Recommendations of the Healthcare Infection Control Practices Advisory Committee. *Infection Control and Hospital Epidemiology* 2005;26(6):580-587.
2. Graves N, Halton K, Lairson D. Economics and Preventing Hospital-Acquired Infection: Broadening the Perspective. *Infection Control and Hospital Epidemiology* 2004;28(2):178-184.
3. Hautemaniere A, Cunat L, Diguio N, et al. Factors determining poor practice in alcoholic gel hand rub technique in hospital workers. *Journal of Infection and Public Health* 2010;3:25-34.
4. Vollaard H, Van de Bovenkamp H, Vrangbaek K. The emerging EU quality of care policy: From sharing information to enforcement. *Health Policy* 2013;111:226-33.
5. Council of the European Union, Recommendation on patient safety, including the prevention and control of healthcare associated infections in 2009/C 151/012009 Brussels: European Union. [http://ec.europa.eu/health/patient\\_safety/docs/council\\_2009\\_en.pdf](http://ec.europa.eu/health/patient_safety/docs/council_2009_en.pdf) Accessed April 30, 2014.
6. Pittet D, Hugonnet S, Harbarth S, et al. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *Infection Control Programme. Lancet* 2000;356(9238):1307-1312.
7. Helder OK, Weggelaar AM, Waarsenburg DC, et al. Computer screen saver hand hygiene information curbs a negative trend in hand hygiene behavior. *American Journal of Infection Control* 2012;40:951-954.
8. Tibbals J. Teaching hospital medical staff to handwash. *Medical Journal of Australia* 1996;164 (7):395-398.
9. Erasmus V, Daha TJ, Brug H, et al. Systematic review of studies on compliance with hand hygiene guidelines in hospital care. *Infection control and hospital epidemiology* 2010;31(3):283-294.
10. Zuiderent-Jerak T, Strating M, Nieboer A, Bal R. Sociological refigurations of patient safety; ontologies of improvement and 'acting with' quality collaboratives in health-care. *Social Science & Medicine* 2009;69(12):1713-1721.
11. Bate SP, Mendel P, Robert G. *Organising for Quality, the improvement journeys of leading hospitals in Europe and the United States*. Oxford: Radcliffe Publishing, 2008.
12. Robert G, Anderson JE, Burnett SJ et al. A Longitudinal, multilevel comparative study of quality and safety in European hospitals: the QUASER study protocol. *BMC Health Services Research* 2011;11:285.
13. Burnett SJ, Renz A, Wiig S, et al. Prospects for comparing European hospitals in terms of quality and safety: lessons from a comparative study in five countries. *International Journal for Quality in Health Care* 2013;25(1):1-7.
14. Swinglehurst D, Emmerich N, Maybin J, et al. Rethinking 'quality' in healthcare *Journal of Health Services Research and Policy* 2014;19:65-66.
15. Baker GR. The contribution of case study research to knowledge of how to improve quality of care. *BMJ Quality and Safety* 2011;20:i30-i35.

16. Miles MD. Qualitative data as an attractive nuisance - the problem of analysis. *Administrative Science Quarterly* 1979;24:590-601.
17. Glaser B, Strauss A. *The discovery of grounded theory*. Chicago: Aldine, 1967.
18. Pettigrew A. Longitudinal field research on change: Theory and practice. *Organization Science* 1990;1:267-292.
19. Fulop N, Protopsaltis G, King A, et al. Changing organisations: a study of the context and processes of mergers of healthcare providers in England. *Social Science and Medicine* 2005;6:119-130.
20. Sandelowski M, Barroso L. *Handbook for synthesizing qualitative research*. New York: Springer Publishing Company, 2007.
21. Zimmer L. Qualitative meta-synthesis: a question of dialoguing with texts. *Journal of Advanced Nursing* 2006;53:311-318.
22. Finfgeld-Connett D. Generalizability and transferability of meta-synthesis research findings. *Journal of Advanced Nursing* 2010;66:246-254.
23. Kirkland KB, Homa KA, Lasky RA, et al. Impact of a hospital-wide hand hygiene initiative on healthcare-associated infections: results of an interrupted time series. *BMJ Quality and Safety* 2012;21:1019-1026.
24. European Commission. Report from the commission to the council on the basis of Member States' reports on the implementation of the Council Recommendation (2009/C 151/01) on patient safety, including the prevention and control of healthcare associated infections, Brussels: European Union, 2012. [http://ec.europa.eu/health/patient\\_safety/docs/council\\_2009\\_report\\_en.pdf](http://ec.europa.eu/health/patient_safety/docs/council_2009_report_en.pdf) Accessed April 30, 2014.
25. Dixon-Woods M, Leslie M, Bion J, et al. What Counts? An Ethnographic Study of Infection Data Reported to a Patient Safety Program. *The Milbank Quarterly* 2012;90(3):548-591.
26. Krein SL, Damschroder LJ, Kowalski CP, et al. The influence of organizational context on quality improvement and patient safety efforts in infection prevention: A multi-center qualitative study. *Social Science and Medicine* 2010;71:1692-701.
27. Groene O, Klazinga N, Walshe K, et al. Learning from Marquis: future direction of quality and safety in hospital care in the European Union. *Quality and Safety in Health Care* 2009;18:i69-i74.
28. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Science* 2012;7(1):37.
29. Edwards R, Charani E, Sevdalis N, et al. Optimisation of infection prevention and control in acute healthcare by use of behaviour change: a systematic review. *Lancet Infectious Diseases* 2012;12:318-329.
30. Ziebland S, Hunt K. Using secondary analysis of qualitative data of patient experiences of healthcare to inform health services research and policy. *Journal of health services research & policy*, 2014 DOI 1355819614524187.





# 10

**Conclusion: Develop people, rather  
than fix the problem**



## 10.1 Introduction

In this last chapter, I answer the research question posted in the Introduction to this thesis: *Which issues hinder or support the development of healthcare professionals working in hospitals to perform improvement work?* This question is answered from the macro, meso, and micro perspectives, combining the findings presented in the previous chapters. The objective of this thesis was to contribute to scientific knowledge on quality improvement work performed by healthcare professionals and provide relevant insights for practice.

Quality improvement in healthcare comprises a major research field. In only 0.33 seconds, Google found approximately 4,800,000 articles, Google Scholar found 1,680,000 articles in 0.19 seconds and PubMed found 70,395 articles with the keywords 'quality improvement healthcare' on April 29, 2014. Most articles describe current problems. Interventions are given relatively moderate attention, and the results of improvement work (following in recent years the SQUIRE guideline <sup>[1]</sup>) are extensively studied. However, what happens in **'doing' improvement work, the 'how to' of improvement interventions**, is seldom studied <sup>[2]</sup>. An action research-oriented case study can obtain more in-depth knowledge on 'how to improve'. This chapter presents the main findings around five themes showing the tensions/challenges that need to be addressed.

In this thesis, the 'how to' of quality improvement work done by healthcare professionals was studied from a **learning perspective**. One side of the coin was the **educational approach**, to teach healthcare professionals how to do improvement work. Here, the whole formal 'teaching and learning' environment in which healthcare professionals are placed during quality improvement projects/programmes was studied. Learning styles (see Chapter 5) and the content taught (see Chapter 6) were starting points for my exploration of how healthcare professionals (fail to) learn (see Chapter 4-6) and how educational approaches and environments can be more supportive (see Chapters 3 and 8). The other side of the coin was the **development of skills** for healthcare professionals in the course of their improvement work. Research questions focused on the combination of motivation for improvement work, learning intentions, learning in social interactions, and learning outcomes. Of particular interest was how healthcare professionals find ways to achieve sustainable improvement results, since this is the major challenge in improvement work. <sup>[2,3]</sup> Combining both sides of the coin influences the development of an organization into a learning organization in which continuous quality improvement takes place.

Conducting this thesis was a learning process in itself; I was a researcher working like as a **reflective practitioner** in both science and practice <sup>[4]</sup>. A reflective practitioner has the capacity to reflect on actions in a process of continuous learning. “The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings, which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation”  
[4 p. 68].

Thus, the research process of this thesis led to my development as both an adviser supporting healthcare professionals in hospitals in their improvement attempts and in my ability as an academic to understand how quality improvement work can best be studied. Since this is very personal (as opposed to universal) endeavour, reflection on this process should also be part of this final chapter. Action science calls this process ‘reflection on action’ <sup>[5]</sup>. Personal in this case does not mean that I worked on the presented research on my own, I had numerous discussions with healthcare professionals and management involved and studied in improvement work, and of course fellow researchers in the projects.

Section 10.2 explains the methods used to answer the overarching research question. Section 10.3 describes the main findings of the studies, elaborating from the macro, meso, and micro perspectives on hindering processes. Both single and double-loop ideas are offered to support healthcare professionals in their attempt to improve quality of care. These suggestions are not based on an ‘either-or’ orientation, but on insights gained from this research offering new directions. Combining both single and double-loop findings might well yield interesting alternatives for the main problems. Section 10.4 reflects on the methodology used and particularly on gathering data as an action researcher. Section 10.5 offers suggestions for further research. Section 10.6 displays the discussion combined with the conclusion on the overarching research question.

## 10.2 Research methods

The objective of this thesis was to understand what hinders or supports healthcare professionals in their attempt to improve the quality of their own organization. Both sides of the coin were examined: learning and teaching processes about quality improvement for healthcare professionals and from a learning

perspective, the development of healthcare professionals during improvement work. Little is known in this research field and the conceptual literature is not based on research done in the public domain or the healthcare sector <sup>[6]</sup>. Case studies often “tackle subjects about which little is previously known or about which existing knowledge is fundamentally flawed” <sup>[7 p. 345]</sup>. Baker notes that case studies “may help to make sense of the complex relationships that underline healthcare practice” <sup>[8 p. i31]</sup> and calls for more in-depth analysis of cases.

Therefore, the **case study method** was used to study how quality improvement work is done by healthcare professionals on the macro, meso, and micro level. The macro level was studied in one part of the QUASER study <sup>[9]</sup>: the governance of quality in various healthcare systems and how organizations try to guide quality improvement work on the meso and micro levels. The meso level was studied in the Dutch quality improvement collaborative, Faster Better <sup>[10]</sup>. The educational approach of quality improvement collaboratives in connection to the improvement work healthcare professionals performed on the micro level was studied. The micro level was studied in two improvement projects focused on reducing healthcare acquired infections, and an improvement programme using care pathways as a methodology to increase the quality, effectiveness.

Data was collected from multiple sources in **four case units** (QUASER, Faster Better, improvement projects in two hospitals), ranging from observations, interviews, narratives, group meetings, surveys, to a document study. Diverse methods were used to analyse this data, ranging from quantitative analysis with SPSS for survey data to open, thematic and axial coding of qualitative data. Chapters 3-9, the inductive stage, share the findings of the single units. These chapters consist of articles that explain the analysis of the data gathered in this specific context.

Multiple case studies typically generate lots of data, which makes analysis complex <sup>[11]</sup>. For the conclusion, an aggregation of the findings on the data collected in the single case studies was needed to gain an overall understanding. An axial coding-based comparative analysis of the differences and similarities in the single case studies found the key factors (type two approach described by Fitzgerald and Dopson <sup>[12]</sup>). In a delineated process, this led to **five maps** on quality improvement work. Cross-unit case studies with comparative analysis are valuable in exploring similarities, commonalities, and differences <sup>[7, 8]</sup>. A comparative analysis across very different contexts is important, since this strengthens the explanatory power of the analysis <sup>[13]</sup>. Baker states that an analysis of multiple units in a case study based not on replication, but on “different cases can emphasise varying aspects of a phenomenon and enable researchers to develop a fuller theory” <sup>[8 p. i32]</sup>.

## 10.3 Findings

The data collection of the research presented in this thesis was performed over a period of six years. An iterative process gained more knowledge on how quality improvement work is influenced, commonly steered, and supported in various contexts. Beyond different cases, more understanding of the problems emanating from the way we are accustomed to work on quality improvement in Dutch healthcare were gained. In particular, how we educate and support healthcare professionals to perform improvement work in the Netherlands. Most of the information behind this understanding is based on qualitative data, collected in the tradition of action research<sup>[5, 14]</sup>. At root, theorising with action research data requires reflexive methods on shared mental maps (assumptions, beliefs, norms, values). Mental maps are ways of looking at things, perspectives, visions, ideas that direct behaviour. Mental maps can be revealed by studying how people act in specific situations (theory in use), rather than what we think and express in interviews (espoused theory)<sup>[15]</sup>. This chapter explains and questions some of the Dutch healthcare mental maps on improvement techniques, steps in improvement process and methods of quality improvement work.

### **10.3.1 How do macro level organizations with an intermediary role in the Dutch healthcare system influence the development of healthcare professionals to perform quality improvement work at the hospital level?**

As elaborated on in the Introduction (see § 1.3) and explained in Chapter 3, the quality improvement agenda in Dutch hospitals can to a large extent be characterised by multi-stakeholder steering (in contrast with other European countries). The cause is the divergent demands of a rising number of external stakeholders. In the Dutch semi market-based system, each stakeholder has the right to set their own priorities, goals and aspirations, and force these onto hospitals. This hyperactivity among all the stakeholders in the system is spawning many new policies, initiatives, and targets. As a result, the Dutch healthcare system is marked by external pressure on hospitals' quality improvement agenda. To gain insight into hospitals' compliance with their 'demands', stakeholders require transparency, based on 'measurements' of daily practice (e.g. indicators), and 'qualifications' (e.g. certificates, rewards).

All these externally driven demands have seduced hospital management into

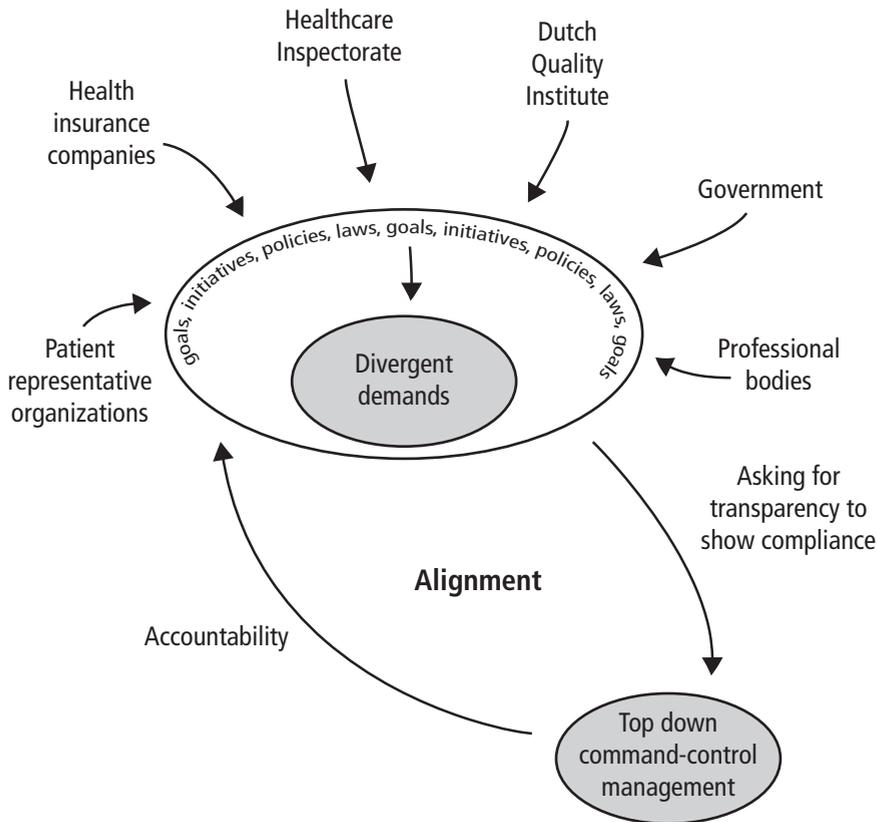


Figure 10.1

adopting a 'command-and-control' approach for quality improvement, a top-down model for managing quality improvement work based on numerical quantification and proxy measures of quality. The assumption is that healthcare professionals will modify their behaviour when there is external pressure to do so. However, external pressure does not provide sustainable change as numerous studies have shown <sup>[16]</sup>. As soon as the pressure is removed, people go back to the previous situation.

Top-down steering of improvement work has overwhelmed healthcare professionals with quality improvement initiatives and goals. Healthcare professionals feel there is not enough time to work on these divergent aims and improve their daily practice. As a result, healthcare professionals treat these initiatives and goals as an administrative burden, which can best be delegated to the quality department. Consequently, healthcare professionals are made disinterested and unmotivated to measure their quality of care and if necessary improve it. The focus shifts to external accountability only for the goals, initiatives, policies, and

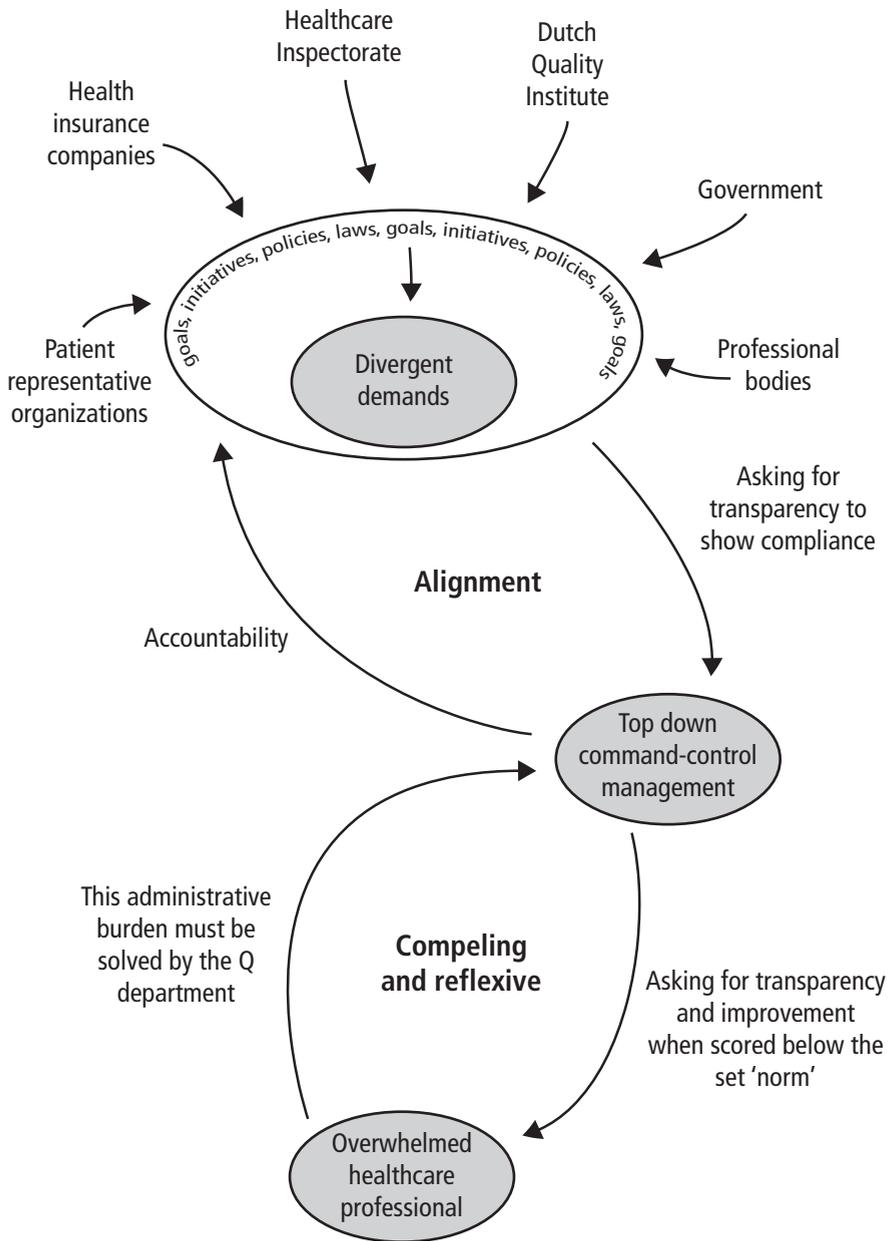


Figure 10.2

mandatory laws.

The single-loop challenge for both healthcare professionals and managers deals with the complexity of stakeholders' divergent demands by combining the call for transparency (based on external accountability) and improvement work (based on internal drivers). More insight is gained into the complexity of providing quality to patients when measurements of what good care is (to all intents and purposes) are coupled with quality improvement in the process of caring.

The single-loop challenge for our system is a learning process wherein different stakeholders align their ideas on what good quality means with healthcare professionals. This process can close the gap between national 'policy' organizations (macro level), management (meso level) and the reality of improving daily practice (micro level). More alignment is needed in the different activities, which can be done on the macro level by merging improvement agendas. For instance, align quality improvement guides, performance indicators, and accreditation standards around specific improvement themes. This study showed that organizations with an intermediary role could play an important role in alignment. Their natural role is to be boundary-spanners across national (policy) levels on the meso level; "they bridge and interact with different disciplines, actors, interests, value systems, fields of activity and institutions" [17]. Alignment can also be provided on the hospital (macro) level.

The double-loop challenge is to balance which parts of quality can be measured and which parts need other, more reflective methods to examine the quality. As the philosopher Kierkegaard (1854) says, "The existence goes beyond any logic. If one believes that calculate everything or modelling is the most important, then – perhaps most – of the world is overlooked" [18]. Wouter Hart and Marius Buiting [19] call for a shift to the intention or meaning of healthcare instead of the goals or objectives of the healthcare system or organization. Their book shows that if we want to increase quality of care, it may be helpful to go back to the origin of organizations and not focus so much on the tumultuous climate that we create in the organizational context. The same can be said about quality improvement work. If we go back to the roots of continuous quality improvement work, we understand that in essence it is not just about working on the deficiencies that are measured and solving problems (single-loop learning). Rather, it is about things that cannot be measured and require double-loop learning processes among healthcare professionals as individuals, collectively, and on the organizational level too. These double-loop learning processes continuously reflect on the quality provided and search for innovations.

### **10.3.2 How does a learning environment contribute to the development of healthcare professionals to perform quality improvement work in their own hospital?**

This thesis studied the educational approach of the Faster Better quality improvement collaborative (see Chapters 4-6) and the development of healthcare professionals in improvement projects (see Chapters 7-9). In all projects, the aim was to educate healthcare professionals during their improvement work. In some cases, the improvement work was on solving problems, in others on implementing new practices and, in yet others, to increase effectiveness and efficiency. During most projects, an expert faculty educated members in improving the 'content' (the aim of the project) and change methodology (how to improve). Only one project (Chapter 8) studied alternative educational methods to educate healthcare professionals.

The study of the Faster Better quality improvement collaboratives showed that the focus of the faculty and their education effort was not on developing healthcare professionals to perform quality improvement work. Nor was their focus on developing the hospitals into learning organizations where continuous quality improvement is part of everyone's daily routine. Rather, the education concentrated on the improvement aim. In addition, they gave no specific attention to the learning processes of either individual participants or teams in the quality improvement collaboratives.

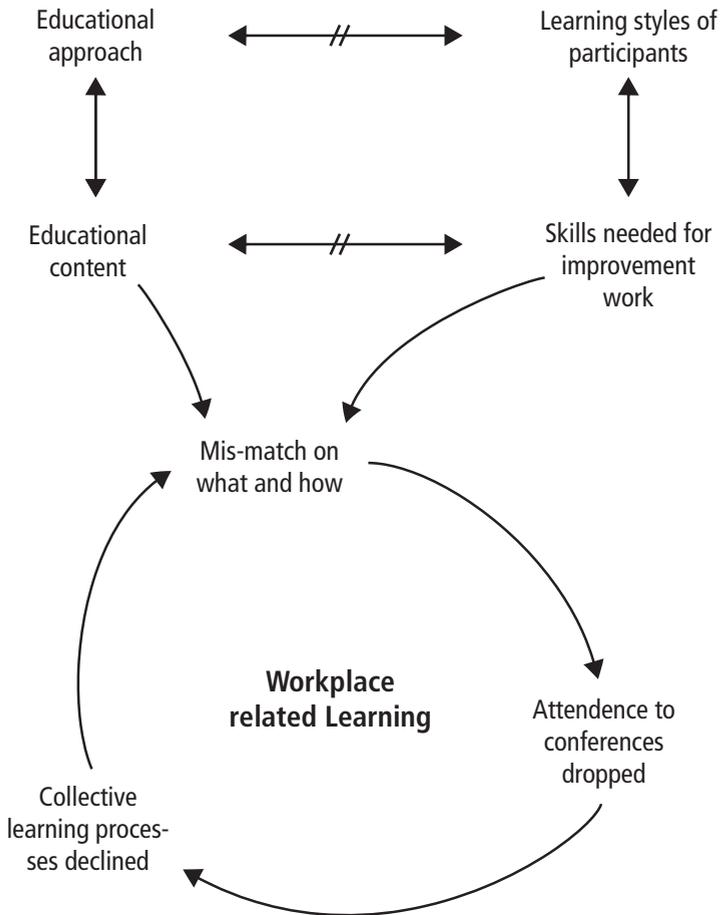
A learning style survey (see Chapter 5) showed that the educational approach did not match the preferred learning style of participants, which was Discovery and Participation <sup>[20, 21]</sup>. There were only marginally significant differences in gender, age and professional background and no differences in project role. The Discovery learning style is guided by personal curiosity. People learn the most in fortuitous real-life circumstances and develop new knowledge by reflecting on their own experiences. The Participation learning style is based on dialogue/discussion to share opinions and sharpen ideas. People learn the most in social environments that stimulate interaction and learning from and with others, such as peer consultations and communities of practice. Both styles require learning environments that consider giving meaning and sense making by reflecting on one's own experiences as important <sup>[20, 21]</sup>.

In the educational components (national conferences, half-day learning sessions, faculty visits, and List-serv) of the studied quality improvement collaboratives, the commonly used learning style was Acquisition and Apperception <sup>[20, 21]</sup>. The

most important educational components were the conferences and learning sessions. At these meetings, the faculty gave lectures on the improvement aim, and healthcare professionals, who had conducted the particular improvement project, shared their story. Guides were also available, with clearly defined activities as implementation suggestions (e.g. the eight principles of Advanced Access<sup>[22]</sup>). At first the Acquisition of knowledge and Apperception of the 'experienced expert' learning style tapped into the participant's need to understand what was expected and obtain a 'this is a do-able project' feeling. The faculty succeeded in their attempt to reduce the complexity of the improvement process into easily understood, clearly defined activities. Yet after the projects started up in the hospitals, the match with their preferred learning style became problematic. Participants felt that what was being taught did not match the problems of their context. The participants needed more interaction with other project team members, faculty and experts on their improvement 'journey'. Jointly they wanted to figure out how to deal with quality problems best, in rapid cycle experiments related to the complexity of the context and especially the behaviour of their colleagues. When this was not offered, the number of project team members attending these meetings declined, resulting in a decrease in collective learning processes.

Transferred knowledge did not match the participants' needs either. As elaborated above, the guides and lectures gave 'bite-size' chunks of information, which ignored the complexity of organizational change. For instance, although the eight principles of Advance Access<sup>[22]</sup> were helpful to understand how to start a project, the teams hesitated to start rapid cycle improvement experiments. The project team focused more on implementing each principle, which meant that the whole change concept, based on experiments to understand their context, devolved into implementation of principles in predetermined steps. When the results were not what they had expected, healthcare professionals became dissatisfied with the support offered by the quality improvement collaborative (see Chapters 4–5). A survey of participants found that the most important skills needed for improvement work were project and change management (see Chapter 6). However, the Faster Better quality improvement collaborative hardly addressed these skills. In the self-assessment survey, participants reported achieving only a moderate increase in these skills in the improvement collaborative.

The research on infection prevention improvement projects (see Chapter 9) showed that most often it was not structures or policies that needed changing, but the people involved. It is not easy to teach project team members how to change their behaviour. This is regarded as 'soft' content, connecting people's personal opinions and behaviour to general change management notions (such



**Figure 10.3**

as the influence of formal/informal power and organizational politics) and thus, it is not easy to teach or transfer as ‘solid’ knowledge. In contrast, some improvement aims have clear solutions and information transfer in educational settings (such as clinical lessons) is only a small part of the solution. For example, to improve hand hygiene behaviour requires adjusting routines and other educational approaches such as reminders on screensavers and visual feedback mechanisms (see Chapters 8–9).

The single-loop challenge is getting faculty and advisers to focus more on educating participants, creating conditions for the development of skills needed for improvement work, including change/project management skills. Special attention should be paid to the Discovery and Participation learning style environment. The combination of both learning styles requires a collective knowledge

creation process that includes providing coaching and advice during the improvement work and offering reflexive spaces and discussion (sense making) meetings. However, one can question if this will support healthcare professionals in continuous quality improvement, as it seems only a modification aimed at teaching the improvement aim more efficiently. For continuous quality improvement professionals need to develop the skill to reflect on their daily practice and discover possible quality improvements. A manager in one of the hospitals said, "They need to develop critical intelligence, or the ability to detect bullshit, or unnecessarily complex processes, or unsafe habits or thwarting politics, and most importantly, the moral courage to expose this publicly."

The second order challenge is to shift from believing that easy-to-transfer 'solid knowledge' is going to run the wheel of continuous improvement to a developmental process of personal skills that support gaining insights in the complexity of improvement work. This requires another 'task' for the faculty of educational programmes. As long as they are solely directed and accounted for as improvement goals that need to be achieved (see Chapter 6), faculty will see the healthcare profession as a business in which 'knowledge' is a commodity. Healthcare professionals are put in the role of customers seeking value for money. Instead, faculty should carefully determine: 1) the strategic focus of education in an improvement work programme, on which basis 2) they can decide which personal development needs and learning goals should be addressed, and subsequently 3) they can design the structure to provide this. In a collective 'expedition' – an endeavour in which everybody understands the final destiny and is well prepared before take off – healthcare professionals try to gain more knowledge to understand the complexity of their context. In this educational process attention should be paid to learning skills, that is, how to reflect and understand your own perspective and those of others. Developing these skills will advance learning competences needed for continuous quality improvement.

### **10.3.3 What factors support or hinder the improvement work of healthcare professionals?**

This section describes three main hindering processes in alignment with supportive single and double-loop suggestions.

#### **Definition of quality of care and goal setting**

As explained in § 1.2, the definition of quality of care is diverse and differs according to the perspective people have. The different levels in the health-

care system (macro, meso, and micro), organizational levels (supervisory board, executive board, business unit directors, discipline leaders, healthcare professionals), medical disciplines (e.g. surgery, maternity, oncology), professional groups (e.g. physicians, nurses, managers, support staff) and positions (e.g. patients, payers, managers, professionals) each value various aspects as representative of 'good' quality. Externally driven demands require improvement of different aspects of quality. As the previous chapter explained, this results in the top-down assignment of concrete, measurable targets for improvement work, thereby trying to steer the aims of improvement work on the micro level.

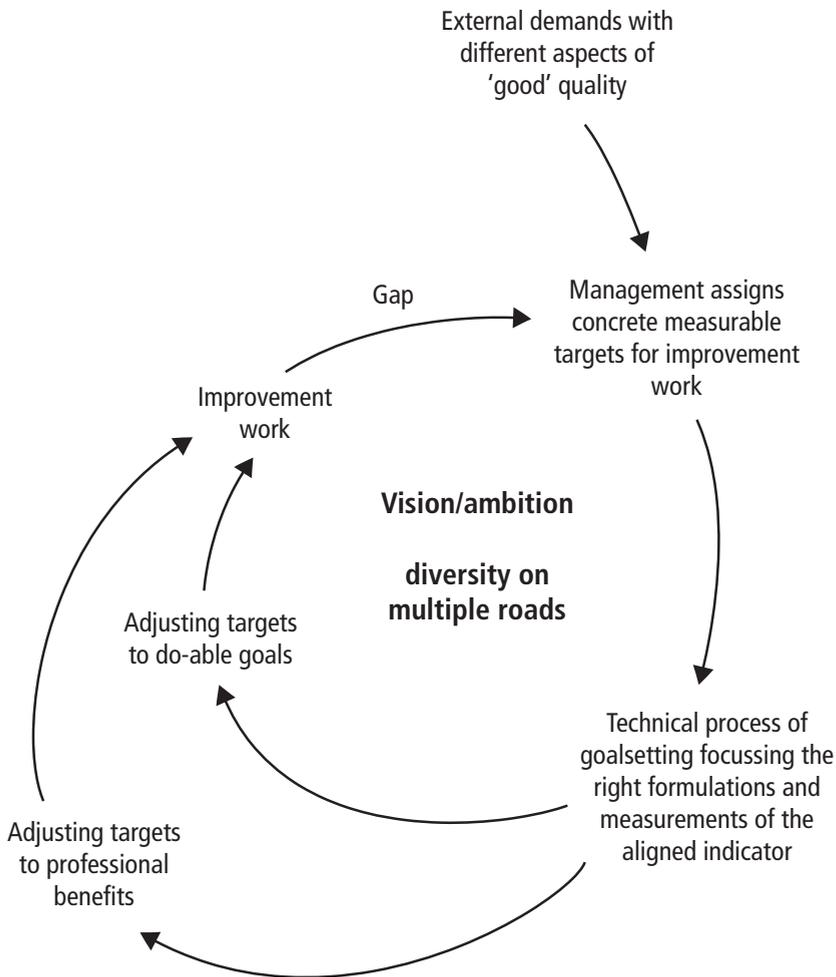


Figure 10.4

My research shows that all the studied improvement work applied a technical perspective on the process of goal setting (see Chapter 4). In the technical perspective, the attention lies on teaching healthcare professionals to draft objective aims (SMART<sup>23</sup> formulation of goals) that must be measured over time, and explaining how to choose to measure the 'right' goal-oriented performance indicators, including nominator and denominators. Surprisingly, of all skills needed in improvement work healthcare professionals said that the ability to do measurements is the least important (mean is 3.9 on a 5-point Likert scale). The ability to make evaluations based on measurements was rated moderately important (m=4.2 for Business Process Redesign and 4.3 for Advanced Access). Of all skills in the Business Process Redesign collaborative, the ability to do measurements increased the most (m=4.1) and this increase was rated as average in the Advanced Access collaborative (m=3.5) (See Chapter 6 for more findings).

The research on the Faster Better collaborative showed that healthcare professionals are not committed to improvement work when their personal goals are not aligned with the targets set on the national (see Chapter 4) or organizational level (see Chapters 7, 9). Healthcare professionals in the Faster Better collaborative adjusted the nationally set goals into 'do-able' and attractive goals in their opinion (see Chapters 4-5). Some healthcare professionals were involved in the improvement projects to benefit their professional discipline, for example, requesting a nurse practitioner to support the work in the outpatient clinic. As soon as it became clear that their request could not be fulfilled, or was already met, they were not so motivated to work on the other improvement aims. These findings were supported in the assessment of skills needed for improvement work. Those skills connected to the aim of the quality improvement collaborative were assessed as moderately important, namely, for Business Process Redesign, reducing total hospitalisation time (m=3.9 on a 5-point Likert scale) and turnaround time (m=4.1) and the ability to devise solutions for bottlenecks or problems based on the Advanced Access principles (m=4.1).

These adjustments to management-set targets led to disappointment in the management and faculty in the quality improvement collaborative. They felt that the improvement projects were not so successful, since they failed to meet the initial aims and targets. A gap existed between management and the project team members, some of whom felt that they had achieved a lot while others felt that their project was a failure (see Chapter 4). Although this point was not studied since data collection did not go beyond the duration of the projects, this gap will probably lead to sustainability issues. Why should management put effort into sustaining an improvement when they feel it is not a real improvement?

The single-loop challenge is to organize the conceptualisation of quality in a more socially oriented way. This way of looking at goal setting lays the accent on a shared vision that perhaps is not entirely concrete, but fosters collaboration and learning in (groups of) individuals. In the care pathway project (see Chapter 7) some teams were encouraged to dream about their desired future and others to formulate an ambition: 'we are the best team of hand surgeons in Europe and operate on the most complex problems children face with the aim to improve every child's life.' In this process team members share a vision or have a collective ambition, which sets off something different from a goal.

The double-loop challenge is to embrace the diversity of views and relevant traits, because this helps to improve healthcare. Senge says that quality improvement can be accomplished only by "breaking with the traditional authoritarian command-and-control hierarchy, where the top thinks, and the local acts. Rather, by merging thinking and acting at all levels of organizations" [24 p. 35]. Giving meaning or making sense of what quality is and sharing what is important for everyone involved was underestimated in the improvement work under study. The challenge is to take the time to gain a temporary agreement on the definition of quality and the traits of quality of care that need improvement. It might be important to clarify the basis of the presence of a person: as an individual, a representative of their discipline, or of an organizational unit. Healthcare professionals belong to a multitude of shifting groups, many of which do not operate as a 'community of practice to improve' as envisaged in the literature (see § 2.5.3).

After obtaining temporary agreement on quality, all concerned could discuss a common understanding of the improvement aim they are all pursuing. Knowing everyone's personal motivation shows different ways to gain results. The effort could try linking those involved and the various smaller objectives contributing to the aim of the improvement work. Not striving to align all the 'ways' and all the professionals involved, but understanding that professionals can follow different routes and all together they provide the 'road' for a particular improvement problem in a specific context.

### **Short-term improvement goals and organizational development**

In most improvement projects studied, there was a strong focus on the 'content' of the quality improvement, the aim that needs to be achieved on time. Management and faculty of the quality improvement collaborative impatiently longed for quick results: to achieve the performance norms connected to the improvement aim. This short-term goal orientation invites healthcare professionals to focus on easily gained improvements and not on the harder to obtain improvements. This research showed that easily gained improvements and quick

results are needed to stimulate enthusiasm, motivate colleagues to get involved and join in. But sometimes 'low hanging fruits' offer an apparent solution but in fact only reproduce the problem as in, for example, the strong focus on optimising pathways and not on understanding the decline in quality of the whole system in care pathway improvement projects (see Chapter 7). Looking just at components (each care pathway) ignored the complexity of the system. Health-care professionals contested some symptoms, but the underlying cause(s) stayed the same.

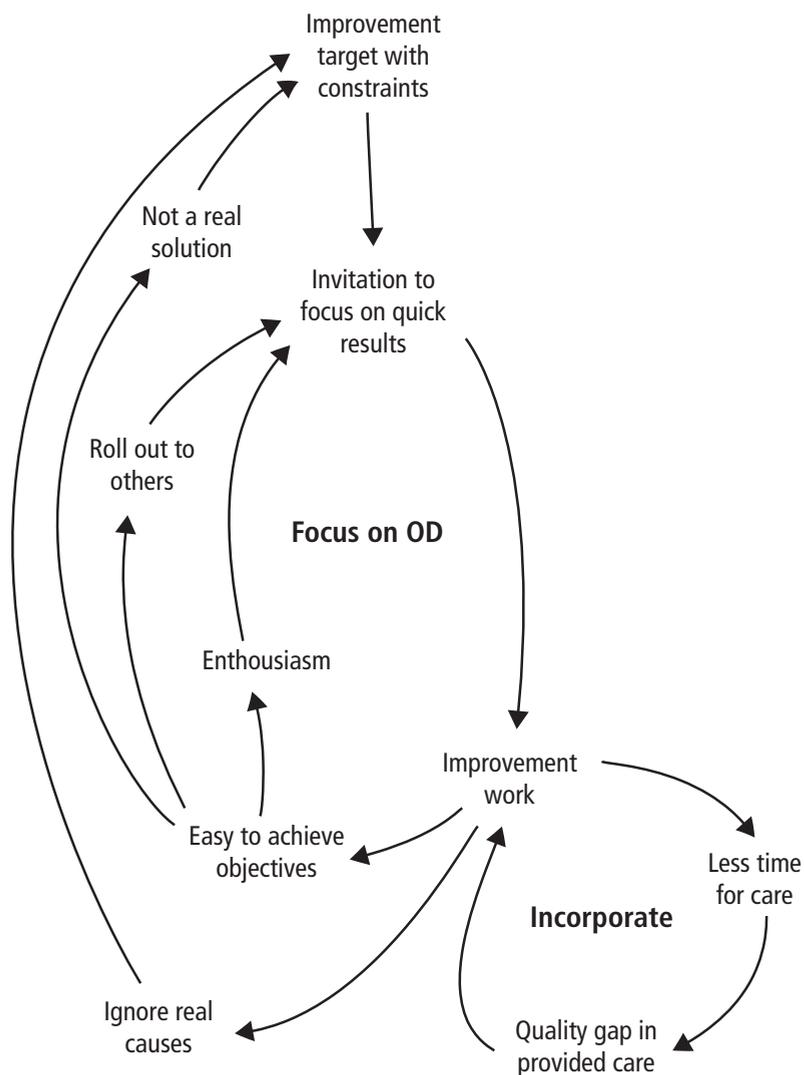


Figure 10.5

Short-term goal orientation and erosion of improvement aims also creates the notion among managers that improvement work is easy. Managers started asking for 'roll outs' and 'implementation' of the successful elements to other parts of the organization, disregarding the fact that each department has its own context and each healthcare professional involved must have the opportunity to fully understand and solve the problems faced. Managers reduced the ongoing quality improvement to tools and instruments that could be applied to problems as they arose. Although tools can help to pinpoint problems and bring them under control, they do not address the larger organizational issues that need to be overcome (see Chapters 4, 7). Managers said that replication of experiments is time consuming and not necessary. They believed that involvement in quality improvement takes too much time away from their daily work. Healthcare professionals also felt that improvement work decreased the time available to spend on patients thus decreasing the quality of care. Urgent care for the patient took always precedence over conducting experiments or improvement project work.

The single-loop challenge is to include conducting experiments in daily routines instead of seeing them as a part of project-based improvement work. Rapid cycle test pilots are needed to understand the system processes and where, when and why problems occur and to assess whether experiments lead to enhanced quality and achieve the desired objectives.

The double-loop challenge is to resist the impatient desire for quick wins and, instead, see experiments and improvement activities as an organizational development endeavour in ongoing quality improvement that is part of every healthcare professional's job. Based on work-related improvement activities, experiments should be treated as meticulous designs to master a development process for healthcare professionals. From this perspective, each experiment could be seen as a valuable experience in understanding the processes, cultures, and organizational structures. It thus educates the healthcare professional in their ongoing improvement effort. Professionals gain new collective knowledge (work experience-based learning). These processes also require such resources as time for healthcare professionals to design experiments, analyse/measure the results, and discuss or question current routines.

### **Projectification of quality improvement**

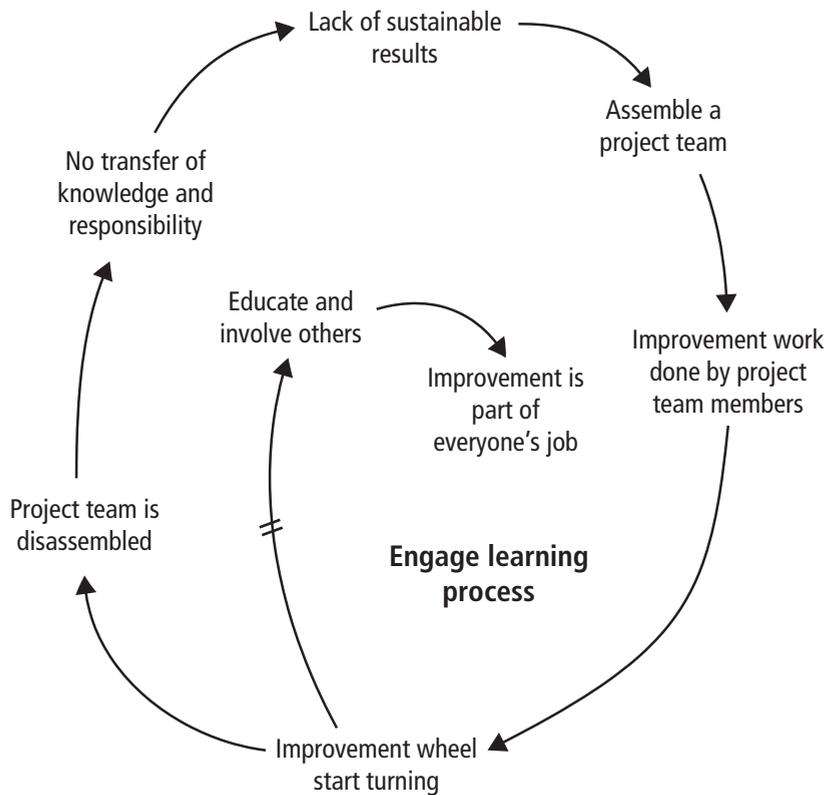
In all hospitals studied project teams perform the quality improvement work. Management assembles a team of healthcare professionals who represent their discipline or department and are motivated for the improvement aims (see Chapters 4, 5, 7 & 9). Projectification of quality improvement work is based

on three major assumptions that hinder the process of continuous quality improvement.

The first assumption is that project teams, as a temporary organizational form, can help the whole organization adapt more easily to the new situation of improved quality. During a project, we can easily assign employees to improve the current situation or resolve the problems we face. A team member has the task of getting the wheel of improvement turning, starting the process of improvement experiments. The second assumption is that the characteristics of the members needed on a project team are key. With a careful selection of team members, the improvement project will most likely succeed. In the quality improvement collaborative the needed characteristics and skills of project members were thought to be based on the knowledge from the literature. The third assumption is that educating a few healthcare professionals means knowledge will disseminate through the organization.

This research showed that the characteristics of the team members are only mildly important in improvement work. Having diversity in the team (see Chapter 7) and professionals with different skills (see Chapter 6) are more important than certain characteristics described in literature. Organizing quality improvement work in projects creates a sustainability problem. As soon as the project team is disassembled, the improvement wheel gradually stops running and the gained results disappear over time. Project team members did not feel responsible for keeping the wheel turning. In addition, a quality improvement project means a lot of (extra) work and can be tiring. Most project teams are supported by (policy) advisers (mostly academically educated) and a secretary. The advisers or secretary took on the role of project 'workhorse', spending much time doing chores for the project team. As soon as the project stops, the 'workhorses' are assigned to other tasks. None of the projects studied had a timeframe for transferring responsibility for the project to formal management or handing over tasks to key employees (establishing an informal structure) to sustain the gained improvements. The acquired knowledge and dissemination of knowledge and translation of the gained understanding to other employees received no attention in the improvement projects studied. This is not surprising since the objective of the project team was focused on the 'content' of the project and not on developing the skills in others. Thus, using project teams for quality improvement work is loosely coupled to the formal organizational structure, resulting in ingrained un-embeddedness in the formal organization.

The single-loop approach could be to make project team members responsible for education and involving other employees. Formal education and guides can be offered to help transfer information or explain the improvement methodologies



**Figure 10.6.**

used. Hospitals must create suitable ways of supporting the flow of knowledge from project team members to other employees. Since healthcare professionals learn especially in Participation and Discovery learning style environments <sup>[20,21]</sup>. Social learning contexts can be set up to share experiences and combine 'real life' experiences with other people. The Discovery learning style focuses more on individual insights whereas the Participation learning style focuses more on collectively gained insights. However, the research on the quality improvement collaboratives (see Chapters 4-6) showed that educating people in 'how to' work was not successful. The Faster Better collaborative described and explained the change package well at centrally organized educational meetings. Nevertheless, project team members suggested that actually improving their practices was different from what was taught. The challenges project team members faced in their hospital were not the same as those presented.

The double-loop learning challenge is to view improvement projects as objects of learning. Team members could be encouraged to set up improvement activities,

which involve all employees. In a collective spiralling process, the competence of the organization to deal with quality issues and problems expands. Also, inter- and intraproject learning activities involving all employees could make implicit/tacit knowledge more explicit and shared with others. This supports (inter-project) translation of knowledge to other improvement aims and situations.

## **10.4 Reflection on methodology**

The previous section provided findings on the hindering and supporting factors of 'how to' do quality improvement work. Various methods to collect data in each unit of the case study were used, but action research data gathering was involved in every case study. Action research is a process-oriented methodology grounded in experience that is used in healthcare for identifying and improving problems in practice [26, 27]. Action research is appropriate when key stakeholders are actively engaged in a reflective process to evaluate, improve, and monitor or study practice [28]. There are two reasons for complementing other sources of data with action research data. First, some qualitative research methods will not provide the deep insights needed. Interviews, focus groups and narratives most probably support the espoused theory: respondents will tell you what they think should be done instead of what is actually done (theory in use) [15]. Second, more in-depth research was needed. This required participation in improvement work to gather data from observations, conversations and reflection with healthcare professionals on their improvement work. As Reason [14] puts it, research should be done 'with' people, not 'to' them to gain a true understanding of how several variables interact. In this way more insights were gained into the (hidden) change methodology, into how healthcare professionals influenced the educational components offered and how informal learning processes influenced organizational development and culture [28, 29].

In action research, the practitioner and researcher are combined in one person. By nature this combination creates tensions between science and practice. The next section offers reflections on this combination and the limitations of the presented research. Section 10.3.1 shares reflections on combining action research with quality improvement methodology. Section 10.3.2 reflects on the role of researcher and Section 10.3.3 reflects on the adviser's role.

### 10.4.1 Reflection on (action research) methodology

In all the research presented in this thesis, the **practitioner** (who is trying to advice and support healthcare professionals aiming to improve quality) is combined with the **researcher** (who wants to discover the hidden mental models of improvement work). Combining the two roles in one person is common in action research, which simultaneously combines data gathering, feedback on practices, and action in practice to develop new theoretical insights<sup>[30]</sup>. Action research combined with a case study design is well described in the literature<sup>[14, 31]</sup>. Action research in case studies is recommended when the research question is explorative, due to a lack of empirically grounded concepts and theories<sup>[7, 32]</sup>. Most importantly, this method is favourable when it is not easy to gain insights, because the subject is 'fuzzy' and has no strict borders. Studying how healthcare professionals can be educated to do improvement work is fuzzy, because what is regarded as education or learning is not well defined, nor is the potential benefit of the improvement effort.

Some authors feel that action research in case studies is not rigorous enough, as the lack of strict controls in data gathering lead to not very valid generalisations<sup>[33]</sup>. Others complain about unsystematic data analysis<sup>[11]</sup>. In this thesis data gathering rigor was obtained by triangulating various types of data and sometimes postponing the analysis until the role of adviser ended. Consequently in these cases, the practice could moderately be influenced by research findings. Therefore, all double-loop learning challenges explained in the previous section can only be seen as suggestions. Other care improvement projects are invited to test and reflect on these<sup>[34]</sup>.

Action research is an emergent process with ethical, role, politics, dynamics and context issues influencing the data collection and analysis<sup>[5, 35]</sup>. The next sections I reflect on the roles of researcher and adviser, and explain how I dealt with the **tensions** in the loyalty to academic rigour versus practical relevance<sup>[36]</sup>.

### 10.4.2 The role of researcher

Healthcare professionals and managers sometimes complain that academic research is not relevant to their problems and needs. One hospital manager complained to me, "I ask you academics to help me to solve this problem, but you come back with a 20-page report explaining that I have a problem and elaborating (on) all the aspects and consequences of this problem. This is not what I want, or what I need." Professionals call for research to find solutions for their problems and needs. On the other hand, academics denigrate the quality of

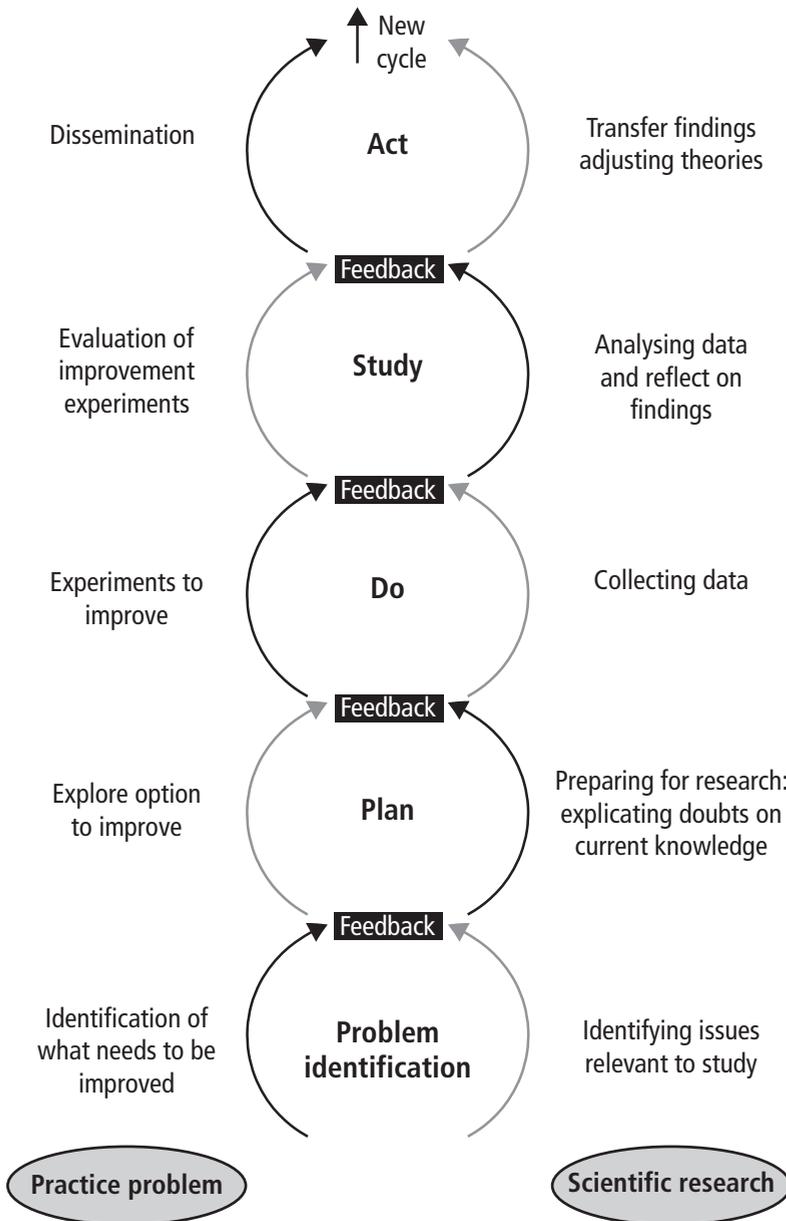


Figure 10.7

research done by practitioners and data collection with action research, because they consider it not rigorous enough <sup>[37]</sup>. One of my excellent colleagues, who has my sincere appreciation, wrote to me about one of the papers in this thesis. "I tend to keep the last part (the action research data) out of the findings and want

to use this in the discussion section.” An editor of a journal wrote, “We were somewhat concerned that the authors of the paper were also advisers to the collaborative under study, and thus may not have been completely impartial.” In my opinion, these viewpoints demonstrate the importance of reflection on data gathering in the tradition of action research. The benefit of action data is that it produces more in-depth knowledge on the ‘what and how’ of influences on particular improvement processes in healthcare practice. However, as an adviser I was an active participant of the ‘object’ of this study. I engaged with healthcare professionals in their Plan-Do-Study-Act improvement processes and had lots of opportunities to influence what was going on. Reflecting on the various stages of the Plan-Do-Study-Act improvement cycle explains the influence of both roles (see Figure 10.7)

### **Problem identification**

Understanding the problems and needs of healthcare professionals meant I could design an aligned research agenda. Project team members were invited in meetings to discuss the current problems, issues and desires which needed to be addressed in the improvement project. This provided me with the basic information on: what is the challenge, why does this problem exist and persist, who is involved and how, what is needed to get improvement going and what should we do more, less or stop doing. Burke <sup>[38]</sup> proposes using narratives in quality improvement research about purposeful moments and suggests that researchers reflect on five key elements:

1. The act (what is done).
2. The scene (the context in which it is done).
3. The agent or actor (who does it).
4. The agency (how it is done).
5. Purpose (why it is done).

In addition, at these meetings I gained more understanding of the norms, values, language used and mental models of individuals and the differences between individuals.

I learned that in this first phase of the Plan-Do-Study-Act cycle tension can arise in relation to the study object, specifically, the degree of influence that actors have on the research question. In this phase, healthcare professionals are invited to express their subjective opinions of the problem and improvement aims. Thereby they influence the improvement work, but as practical relevance is important too, they can also influence the research questions. Allowing healthcare professionals to determine the goals, the changes needed, improvement methodology used,

and the 'success' means that they also have a strong influence on data gathering and analysis. In contrast, the researcher could easily influence the improvement goals by asking certain questions and suggesting to collect specific data to identify the problem (see § 10.3.3).

### **Plan**

The plan phase of the cycle sets the improvement goal and determines the research question. When improvement work and research are aligned I learned the benefits of using the literature. It provided healthcare professionals with insights from current evidence allowing healthcare professionals to choose a more scientifically based improvement experiment. The literature also shows which research questions have not yet been (sufficiently) answered.

In this phase it is important for research to reduce complex issues to research questions, which can be studied within a limited time frame. Otherwise, an overwhelming number of data gathering moments lurks. This was the case in the care pathway project (Chapter 7) where I almost 'drowned' in the data. It took over a year to transcribe and code everything. This reveals the tension between including everything and making (sharp) cuts between pieces. Pieces/parts help to focus, to embark upon improvement work and choose wisely in which data to collect. However, splitting things into pieces easily distracted me from touching the underlying causes or seeing the wickedness of problems. It stopped me from seeing and studying how the separate pieces influence one another and thus from gaining a clear overview of the whole 'system'. When I shared my analyses with healthcare professionals I sometimes gave them single-loop suggestions, since the conclusions were biased because data was missing or excluded. I learned that when I did not offer my analysis as an expert on the matter, but as a process adviser offering a way to start a discussion with the healthcare professionals involved.

The experience with the large amounts of data showed me the value of keeping a systematic research diary. It helped me to gather everything, understand the structure of the data and, afterwards, decide how to proceed in the analysis, for example, what to transcribe and which minutes to include, and narrowing my coding because themes had already emerged. I found the research diary helpful in distancing myself from practice and making data meaningful.

### **Do**

During the do phase, improvement experiments start in practice, trying out different solutions and change methodologies. Action research is characterised as a collaborative process between researcher and practice, trying to improve

practice with new approaches (i.e. activities, change methodology or mental models) <sup>[14]</sup>. The results of the improvement experiments – action research calls these interventions – are studied and reflected on in this phase. Afterwards, if the desired outcome is not achieved, a new experiment starts; at least this should be an ongoing process in continuous quality improvement. For practice, the relevance of the experiments is crucial. However, research sometimes requires you to stick to a solution, and gather enough data to conclude (scientifically) that this is not the way to proceed. This shows the tension between solving the problem in daily practice and scientifically concluding there is a lack of improvement despite the intervention.

In addition, in the literature authors complain that too many action research findings are presented in the name of relevance, without a basic research methodology <sup>[35]</sup>. I learned that without a proper research design it is easy to get an uneven data collection and flawed or even questionable conclusions. Using several interventions at the same time and shifting or drifting during the improvement phase challenges the researcher to keep the project team on track. I learned that the ‘solution’ was to establish a rigorous data collection plan/research protocol upfront and involve healthcare professionals in research. When professionals are involved they are less likely to undermine the research protocol. Nevertheless, there were limitations to planning and predicting the change process that affect the data collection and analysis plan. Bate argues that “change is not imposed, or even knowable, but discovered as it happens as part of an ongoing learning process” <sup>[36 p. 491]</sup>. Therefore, established data collection plans/research protocols sometimes needed adjustment, because new themes emerged or interesting new topics could be studied. This decreased the validity of the research, but increased the help offered to practice. Besides this, the practice (i.e. healthcare professionals, advisers, managers) also contributed to the rigour of data collection and data analysis. For instance, I asked them to collect data or systematically reflect on the data. In the care pathway project, advisers were involved in data collection of the ‘how’ (process) of improvement work too, writing reflective journals on their experiences (see Chapter 7).

### **Study**

The study phase centres around feedback cycles on the performed improvement work to determine if the goals are received. Especially in this feedback phase I sometimes felt a tension between presenting my scientific findings and what practice needs to engage healthcare professionals in improvement work. My scientific findings were sometimes brutally honest, exposing unwritten rules that everyone implicitly knows should not be revealed. Revealing dysfunctional mind-sets too easily ‘accuses’ people, teams or disciplines, or discloses a system

of escalating and self-perpetuating problems. I learned that using their words, explaining my findings in metaphors or visuals (e.g. pictures, models) and sharing quotes helps to get the message across while dodging sensitivities. In addition, formulating my findings as possible (but not necessary!) ways of looking at things stopped people from becoming offended or defensive. Bate wonderfully refers to this as "...making the familiar strange. A lot of issues in organizations are 'known but not said' and certainly not shared" <sup>[36 p. 482]</sup>. I also noticed that using humorous remarks and including myself as one of the team – using words like us and our – helped to prevent negative aspects arising. I reframed my findings in generalised stupidities, collective exasperations or commonly used hindrances to the ways of doing things. In addition, I used the 'sandwich' technique to share my findings in a more positive light, first explaining what is good and helpful, only then coming up with the more negative remarks and summarising my findings afterwards. This showed the two sides of the coin: both the positive and negative.

## **Act**

In the Act phase, successful experiments are disseminated in practice, scaled up, and implemented (in other settings). I used systematic reflections in the Act phase in all the projects studied to 'defrost' implicit knowledge based on experiences of the improvement work. The aim was to collectively learn about what was often a difficult and challenging process. However, this also provided relevant insights for research. Bruner <sup>[38]</sup> distinguishes two ways of reasoning that can be combined in this phase. The first is logical-scientific reasoning, which understands specific phenomena as an example on which to base generalisations. Logical-scientific reasoning is in the presentation of the research findings. The other is narrative reasoning, used to understand the human experience and purposes. Narrative reasoning can be part of the collective process of giving meaning or sense making which highlights the important elements, letting others fade away. I learned that other data is shared in the Act phase than in the study phase. In the latter, healthcare professionals are in the middle of their improvement work. As a researcher I was still in the process of making sense of the data and understanding how we should proceed. In the Act phase both healthcare professionals and researcher are not impartial enough. I learned it is most helpful to reconstruct improvement work and at the same time reflect on the research performed. I mirrored the healthcare professionals' assumptions, beliefs and sometimes showed them contrasting views. Next, I elicited discussions of my findings on their daily practice and customary ways of collaborating on improvement work. I hope that I thus helped not only to clarify their problems and needs (single-loop learning), but also in 'educating' them to reflect upon these (double-loop learning). Reflecting on collected data was beneficial for science, because then I could collect additional data. During conversations and discussions, the professionals (see Chapter

7) and experts (see Chapter 6) clarified, explained, and supplied missing information. Their interpretations of my findings gave me deeper insights and were helpful for member-checking reasons too.

### 10.4.3 The role of adviser or coach to improvement teams

Given the nature of individual self-serving biases <sup>[40]</sup>, most advisers believe in the efficacy of what they are doing and are likely to see their effort as having a positive effect. Therefore, I chose not to analyse myself in the three case units (presented in Chapters 3-8), but looked at the educational environment that others have shaped and the improvement work done by healthcare professionals. However, I conducted the research with an applied research focus in mind: What questions from healthcare professionals need an answer? What can research tell us that can help them?

In this section I reflect on my role as adviser in the cases studied and how it influenced the research. I hope this reflection provides new insights into the role that advisers and faculty can play in supporting the learning processes in hospitals and the education of healthcare professionals in improvement work.

In all three case study units I was an external adviser. Coming from outside the hospital, I was never a formal team member. Hence, I was not constrained by local political issues and power dynamics between team members or stakeholders. Nor was I involved in or gained benefits from the targeted improvement goals. Therefore I could be an objective bystander. On the other hand, I am trained and shaped as a healthcare professional (registered nurse) and have been involved in quality improvement work in hospitals for over 20 years. I understand the mores and norms of healthcare professionals collaborating on quality improvement work. Therefore I am per definition not an objective outsider. Yet I tried to work with the “heart of an insider and the view of an outsider” <sup>[41]</sup>. Being an ‘outsider’ allowed me to ask frank questions, give reflections, provide just-in-time learning input by sharing my opinion of what was going on, and questioning the team’s perspective <sup>[42]</sup>. Yorks et al. describe this role as “sophisticated barbarian, who by his/her very outsider nature, is intended to see the situation through fresh eyes and then use those insights to raise critical questions to help reframe the participants’ understanding” <sup>[43 p.381]</sup>. In all case units, I arranged written agreement upfront on my independence as a researcher and prohibited censorship or screening of my work.

As an adviser, my role was to coach/support teams or management in their improvement aim. This involved giving intellectual input to the improvement processes and helping the teams bring about change in their practice, including daily processes, culture, and routines. I was specifically interested in developing and enhancing the skills needed for ongoing improvements to daily practice. Wageman et al. describe this role as “coaching in direct interaction with a team intended to help members make coordinated and task-appropriate use of their collective resources in accomplishing the team’s work” [44 p.269]. Using myself as a tool to foster the team member’s development and, on the other hand, being the researcher of this topic was a challenging combination [15]. I learned that I usually base many of my interventions intended to help people and teams on intuition, or tacit knowledge. This research challenged me to examine my verbal interventions (in countless hours of listening to recordings of meetings, conversations, and interviews) and thus learn more about my assumptions and personal feelings (double-loop learning).

I gained more understanding of the appropriate time and way to do an intervention. Most (healthcare) advisers, including myself, are trained to intervene when problems arise. Taking the responsibility to solve the problem by providing the ‘right answer’ either for the next step in the process or explaining the solution or my diagnosis of the problem [45]. This can be seen as giving support to single-loop learning, and helping the healthcare professionals to work within the existing paradigm. I learned that a focus on the educational approach and the development of healthcare professionals provides a new view on the task of advisers. I noticed that allowing problems to occur, and sometime even (subtly) making them worse, is ‘good stuff’ to use as learning material. Quick interventions are less helpful when the primary aim is the development of healthcare professionals. Asking questions and mirroring my observations enabled me to help healthcare professionals reflect on their assumptions of the diagnoses of problems and the way they usually solved their problems. This meant double-loop learning was more the focus of my interventions.

According to O’Neil and Marsick [45], the practice that supports learning from experiences includes active listening, questioning, non-verbal behaviour, giving motivational/developmental feedback, exploring assumptions, reframing and silence. The principle of “saying nothing and being invisible” [46 p. 273] was sometimes hard for me, due to my advisory role in all the case studies. Especially in the care pathway programme (see Chapter 7) I often felt that the team members put me under pressure to take on the role of educator/expert instead of facilitator of the learning process. I experienced that helping healthcare professionals to learn through and from their own experiences is not easy. Do nothing, let team

members work things out for themselves because this best fits their learning style (see Chapter 5) and is the best response in a strategically educational focus. However, for me it was the most 'energy-devouring' task.

The same occurred in my feedback conversations, when I shared my scientific findings and newly gained theoretical insights with the professionals. I impacted directly on their improvement work: problem diagnoses, context definition, and action taking. I tried to be careful and not force them to apply my mental models, but to develop a reflective mode or a kind of awareness of their own mental models, by contrasting both our models. I tried to shape myself as a 'reframing device' to help healthcare professionals step outside their normal mode of thought and reposition or realign themselves to new ways of thinking or adjust their mental models. In this I was less an expert on the subject and more a learning-process facilitator.

In summary, in this section I studied myself in my dual role of researcher/adviser, but not with the aim of providing scientific evidence on how action research in improvement work should be done. Rather, to show how I personally dealt with the combination of practice and science and how I managed the tensions arising from this connection. Now I understand more about the sometimes blurred and fragile line I am walking on. I feel committed to the improvement aim, yet also understand the importance of robust data for science. This thesis and each case unit of research was a mutual learning process in which I collaborated with healthcare professionals and managers on the aim of discovering what the quality issues are, why quality problems exist, and how we can address them.

## 10.5 Further research

A complex phenomenon such as quality improvement cannot be fully captured by research undertaken from one dominant perspective (i.e. learning theories). Several perspectives are needed to provide opportunities for contrasting and complementary interpretations of the phenomenon. The multiplicity of possible theoretical views helps us to gain a better overview of the interdependencies that influence quality improvement work. Using the learning perspective as a backdrop made it easier for me to identify theoretical findings that could help both understand and explain the interdependencies between the (in)formal education of healthcare professionals in improvement work and the way learning can simultaneously be supported during improvement work.

Further research is needed to gain more understanding of the improvement skills necessary for healthcare professionals to change their daily practices [47, 48]. Although retention of all knowledge and skills is difficult to achieve and a challenge for faculty, developing the skills to continuously improve practice should be the ultimate goal [49]. Therefore, better assessment methods must be developed, which not only address the knowledge, but the multifaceted skills necessary to engage other professionals in improvement activities.

In addition, more research into the transfer of knowledge and skills would be useful. In a systematic review Nadeem et al. [50] studied the connection between the educational components of quality improvement collaboratives, such as phone meetings, collaborative extranet, site visits, learning sessions and training (see Chapters 5–6) and achieved improvement goals. They conclude that it is impossible to identify effective educational components, because of imprecise reporting. Most articles report only objective results of the improvement work based on the improvement aim and not on actual increase in skills. The same conclusion can be drawn of educational programmes for healthcare professionals [51] (see § 1.2.2). The question, are professionals competent enough to make quality improvements after taking these courses is hardly addressed in science [52]. Hence, there is little scientific knowledge on the effectiveness of educational efforts to teach healthcare professionals the methods and approaches of quality improvement. Several research questions should be answered to justify the money spent and effort put into educational programmes. For instance, how did participants apply the new knowledge and skills in their organization beyond the course of the quality improvement programme? Which learning activities are the most effective to teach knowledge and develop skills? Future research should also include how learning styles can meet in different phases of improvement projects. Further work is needed on the interplay between the participants' learning styles, learning approaches in educational programmes (such as quality improvement collaboratives) and how this can be geared to facilitate the improvement processes in healthcare professionals' daily practice. Using more of the learning opportunities in and around the workplace would meet the preferred learning style Discovery and Participation. Further research can help crack open how healthcare professionals reflect on their experience in improvement work. Relevant research questions include: What is the nature and extent of social learning processes among healthcare professions? How do these processes support double- and triple-loop learning? How can advisers and faculty support the examination of mental models?

From a methodological perspective, more research on how to conduct rigorous action research is needed. Each analysis gave me the opportunity to learn more

about the relationship between educating healthcare professionals in improvement work, and how this education contributes to the success or failure of quality improvement work in hospitals. During these analyses, I developed theoretical ideas that abstract the essence of what I observed or measured and the relationships I noticed <sup>[12]</sup>. In a deductive process I tried to take these theoretical ideas from one case unit to the next, testing if newly gained insights were confirmed in the next case. Note that this 'hypothesis testing' will continue after this thesis is completed, because I need many more cases to test and confirm (or reject) my findings. New research will help further specification and more precisely define the studied phenomenon (e.g. circumstances, correlations of educating healthcare professionals to perform quality improvement work) as well as ways to develop myself as an action researcher serving both practice and science <sup>[53]</sup>.

## 10.6 Concluding remarks

The combination of doing quality improvement work aimed at tangible improvement in the quality of care and, at the same time, developing employees has not been studied yet in the field of healthcare. Research suggests that lack of knowledge and skills among healthcare professionals and managers is a barrier to quality improvement <sup>[54]</sup>. The literature stresses the importance of educating healthcare professionals in improvement work <sup>[55-57]</sup>. Some research in this respect has been done in organizational studies, focused on 'learning by doing' <sup>[20, 58]</sup>. Research is focused on solving real work problems in real time and the "balance to their work with the learning from that work" <sup>[20, p.2]</sup>. Despite numerous articles, not much was known about the knowledge and skills participants need for improvement work <sup>[45, 59, 60]</sup>. Therefore, my overarching research question was: *Which issues support and hinder the development of healthcare professionals working in hospitals to perform improvement work?*

This thesis showed that the quality improvement agenda of Dutch hospitals is heavily influenced by demands from various external stakeholders. The common way to work on improvements in the Netherlands is to start an improvement project. Management (carefully) assembles a project team and gives them the task to create the change needed to achieve their goals. The task for this project team is to solve quality problems or implement (outside-driven) new initiatives. Healthcare professionals in these project teams receive some educational support. The current notion in Dutch quality improvement work is that when we educate healthcare professionals to perform improvement work, the project

team members can change the context (structures, cultures, people) while they do this work. Therefore, the educational approach is mainly focused on transferring bite-sized bits of information on activities based on best practice connected to the improvement objectives. However, this research showed that the educational support offered in quality improvement collaboratives (as forms of communities of practices) does not match the preferred learning style, nor is the content taught. The skills connected to the improvement aim are seen as the most important skills to develop. The participants regarded project and change management skills as more important. These skills were hardly addressed in the educational components and participants felt that the content was not based on the 'real thing' they were facing in their hospitals. The participants' preferred learning styles, Participation and Discovery, both ask for realistic situations that reflect every-day practice. The participants' daily practice was only a moderately important educational component and educational approaches such as site visits, on-the-job training (Discovery), and peer-to-peer consultation, as well as dialogues with experienced project leaders and/or leading consultant clinicians (Participation) were all lacking. Thus participation in the educational components declined and this led to a decrease in collective learning. Given the importance of collaboration in the daily practice of healthcare professionals, it is remarkable that developing social skills and knowledge to work collaboratively on improvements in daily practice is regarded as something that will occur naturally and teaching how to perform continuous quality improvement does not require educational efforts. Hesse et al. <sup>[64 p. 38]</sup> define collaborative improvement effort in daily practice as "approaching a problem responsively by working together and exchanging ideas... particularly useful when dealing with problems that are complex." This thesis showed that collaboration in improvement work relies on preconditions of a learning organization (see Chapter 4). These preconditions can be understood from the social and technical perspective. In the social perspectives, more attention is given to a collaborative process of building a shared vision of a desirable future state, interpretation of information about performance and through dialogue and discussion analysis. In the technical perspective, the emphasis lies on making formal agreements with quantified targets, on learning technical skills to measure, analyse and interpret results, and on establishing different communication channels for the flow and transfer of information.

Based on the results of this study I conclude that the way improvement projects are organized facilitates single-loop learning: fixing the 'deficit' or perfecting what is already there. Sometimes this is enough to attain the goals, because the problem is well understood and easy to achieve. If this is the case, one can question why an improvement project was needed. This research showed that in these cases other educational approaches, such as displaying gain-framed

messages on a screensaver, are useful. However, most quality improvement aims are not easily obtained, because the context is complex. Pronovost states, “Many quality improvement projects often fail to achieve their goals... An even larger number of projects fail because of adaptive challenges. Adaptive challenges can only be addressed through changes in people’s priorities, beliefs, habits, and loyalties” <sup>[61 p. 560]</sup>. Research has shown that changing people’s behaviour requires more than getting them to follow given directions <sup>[62]</sup>. This suggests that more double-loop learning is needed. Double-loop learning involves examining the dominant assumptions and opinions (mental models) about oneself, the task or situation and the others involved. I showed how team members collectively make a mental representation of the problem state (discrepancy between current state and desired state) and in a process from inductive to deductive thinking gain understanding of the patterns and relationships between the different actors and elements involved. In the research on frictions occurring in pathway development and implementation – presented in Chapter 7 of this thesis – I showed how double-loop learning can be supported. In addition, in this final chapter I explained five mental models that hinder healthcare professionals in their attempt to improve quality and I provided double-loop insights as challenges for the future. I hope that these insights will drive a shift away from the current way of looking at quality improvement. The current way in quality improvement is driven by outside pressure, with assessment based on measures and projectification. I call for a process where healthcare professionals are supported to work continuously on quality improvement, because they have gained the reflective skills needed for double-loop learning. Boud and Walker <sup>[63]</sup> identified the most influential barriers to learning from experience. These include not recognising one’s own assumptions, not being able to reflect on one’s own experiences and lack of skills to change established thinking patterns. “Reflection consists of those processes in which learners engage to recapture, notice and re-evaluate their experiences, to work with their experience to turn it into learning” <sup>[65 p.9]</sup>. Learning increases when team members are supported in the process of learning from examining and discussing the perceptions of other team members.

## References

1. See: <http://squire-statement.org/guidelines> Accessed December 27, 2014.
2. Shojania KG, Grimshaw JM. Evidence-based quality improvement: the state of the science. *Health Affairs* 2005;24 (1):138-150.
3. Buist MD, Middleton SL. What went wrong with the quality and safety agenda? An essay by Michael Buist and Sarah Middleton. *British Medical Journal* 2013;347:f5800.
4. Schön D. *The Reflective Practitioner, How Professionals Think In Action*. Basic Books, 1983.
5. Coughlan P, Coughlan D. Action research for operations management. *International journal of operations & production management* 2002;22 (2): 220-240.
6. Rashman L, Withers E, Hartley J. Organizational learning and knowledge in public service organizations: A systematic review of the literature. *International Journal of Management Reviews* 2009;11 (4):463-494.
7. Gerring J. *Case study research: principles and practices*. Cambridge University Press, 2007.
8. Baker GR. The contribution of case study research to knowledge of how to improve quality of care. *BMJ Quality and Safety* 2011;20:i30-i35.
9. Robert G, Anderson J, Burnett S, Aase K, Andersson-Gare B, Bal R, Calltorp J, Nunes F, Weggelaar AM, Vincent C, Fulop N and the QUASER team. A longitudinal, multi-level comparative study of quality and safety in European hospitals: the QUASER study protocol. *BMC Health Services Research* 2011;11 (1): 285-289.
10. Vos L, Dückers M, Wagner C. *Evaluatie Sneller Beter pijler 3: resultaten van een verbeterprogramma voor ziekenhuizen*. Utrecht: NIVEL, 2008.
11. Miles MB. Qualitative data as an attractive nuisance: the problem of analysis. *Administrative science quarterly* 1979;590-601.
12. Fitzgerald L, Dopson S. Comparative case study designs: their utility and methods. In: Buchanan DA, Bryman A, eds. *The Sage Handbook of Organizational Research Methods*. Thousand Oaks, CA: Sage, 2009:465-483.
13. Yin RK. *Case study research: Design and methods*. Thousand Oaks, CA: Sage, 2009.
14. Reason P, Bradbury H. *Handbook of action research: Participative inquiry and practice*. Thousand Oaks, CA: Sage Publications Limited, 2001.
15. Argyris, C., & Schön, D. (1978) *Organizational learning: A theory of action perspective*, Reading, Mass: Addison Wesley.
16. Swinglehurst D, Emmerich N, Maybin J, et al. The many meanings of 'quality' in healthcare: interdisciplinary perspectives. Cumberland Lodge, 2013. <http://www.cumberlandlodge.ac.uk/Programme/Recent+events/Quality+in+Healthcare> Accessed March 15, 2014.
17. Tetroe JM, Graham ID, Foy R, et al. Health research funding agencies' support en promotion of knowledge translation: An international study. *Milbank Quarterly* 2008;86:125-155.
18. Kierkegaard S. *The concept of dread*. Princeton: Princeton University Press, 1957.
19. Hart W, Buiting M. *Verdraaide organisaties: terug naar de bedoeling*. Deventer: Kluwer, 2013.

20. Simons P, Ruijters MC. Varieties of work related learning. *International Journal of Educational Research* 2008;47 (4):241-251.
21. Ruijters M. *Liefde voor leren: over diversiteit van leren en ontwikkelen in en van organisaties*. Deventer: Kluwer, 2006.
22. Murray M, Berwick DM. Advanced Access: Reducing Waiting and Delays in Primary Care. *JAMA* 2003;289 (8):1035-1040
23. SMART is an acronym for Specific, Measurable, Attainable, Result-driven and Timely.
24. Senge P. It's the learning: the real lesson of the quality movement. *Journal for Quality and Participation* 1999;34-40.
25. Winter R, Munn-Giddings CA. *Handbook for action research in health and social care*. London: Routledge, 2001.
26. Waterman H, Marshall M, Noble J, et al. The role of action research in the investigation and diffusion of innovations in healthcare: the PRIDE project. *Qual Health Research* 2007;17:373–381.
27. Morrison B, Lilford R. How can action research apply to health services?. *Qualitative Health Research* 2001;11 (4):436-449.
28. Pawson R, Tilley N. *Realistic Evaluation*. London, England: Sage Publications Ltd, 1997.
29. Berwick DM. The science of improvement. *JAMA: the journal of the American Medical Association* 2008;299 (10):1182-1184.
30. Zuber-Skerritt O. *New directions in action research*. Brighton: Falmer Press, 1996.
31. Coghlan D, Brannick T. *Doing action research in your own organization*. Thousand Oaks, CA: Sage Publications Limited, 2009.
32. Bradley EH, Curry LA, Devers KJ. Qualitative data analysis for health services research: developing taxonomy, themes, and theory. *Health services research* 2007;42 (4):1758-1772.
33. Campbell DT. Degrees of Freedom and the Case Study. *Comparative political studies* 1975;8 (2):78-193.
34. Schein EH. Process consultation, action research and clinical inquiry: are they the same? *Journal of Managerial Psychology* 1995;10 (6):14-19.
35. Susman G, Evered R. An assessment of the scientific merits of action research. *Administration Science Quarterly* 1978;23:582–603.
36. Schein EH. *Clinical Inquiry/Research*. In: Reason P, Bradbury H. (eds.) *Handbook of action research. Participative inquiry and practice*. Thousand Oaks: Sage, 2001
37. Hyatt D, Cropanzano R, Finfer LA, et al. Bridging the gap between academics and practice: Suggestions from the field. *Industrial Psychologist* 1997;35 (1): 29-32.
38. Greenhalgh T, Russell J, Swinglehurst D. Narrative methods in quality improvement research. *Quality and Safety in Health Care* 2005;14 (6):443-449.
39. Bate P. Synthesizing research and practice: using the action research approach in healthcare settings. *Social Policy & Administration* 2002;34 (4):478-493.
40. Fiske ST, Taylor SE. *Social Cognition*. New York: Mcgraw-Hill Book Company, 1991.
41. Quote from my esteemed friend Birgit Dewez
42. Dilworth RL, Boshyk Y. *Action learning and its applications*. Hampshire: Palgrave Macmillan, 2010.

43. Yorks L, O'Neil J, Marsich VJ, et al. Boundary management in action reflection learning research: Taking the role of a sophisticated barbarian. *Human Resource Development Quarterly* 1996;7 (4):313-329.
44. Wageman R, Fisher CM, Hackman JR. Leading Teams When the Time is Right: Finding the Best Moments to Act. *Organizational Dynamics* 2009;38 (3):192-203.
45. O'Neil J, Marsick VJ. Action Learning Coaching. *Advances in Developing Human Resources* 2014:1-20.
46. Coghlan D, Casey M. Action research from the inside: issues and challenges in doing action research in your own hospital. *Journal of advanced nursing* 2001;35 (5):674-682.
47. Mittman BS. Creating Evidence Base for Quality Improvement Collaboratives. *Annals of Internal medicine* 2004;140:897-901.
48. Boonyasai RT, Windish DM, Chakraborti C, et al. Effectiveness of teaching quality improvement to clinicians: a systematic review. *JAMA* 2007;298 (9):1023-1037
49. Davies P. What is evidence based education?. *British journal of educational studies* 1999;47 (2):108-121.
50. Nadeem E, Olin SS, Hill LC, et al. Understanding the components of quality improvement collaboratives: A systematic literature review. *Milbank Quarterly* 2013;91 (2):354-394.
51. Windish DM, Reed DA, Boonyasai RT, Chakraborti C, Bass EB. Methodological rigor of quality improvement curricula for physician trainees: a systematic review and recommendations for change. *Academic Medicine* 2009;84 (12):1677-1692.
52. Lipstein EA, Kronman MP, Richmond C, et al. Addressing core competencies through hospital quality improvement activities: attitudes and engagement. *Journal of graduate medical education* 2011;3 (3):315-319.
53. Dyer WG, Wilkins AL. Better stories, not better constructs, to generate better theory: a rejoinder to Eisenhardt. *Academy Management Review* 1991;16 (3): 613-619.
54. Audet AMJ, Doty MM, Shamasdin J, Schoenbaum SC. Measure, learn, and improve: physicians' involvement in quality improvement. *Health Affairs* 2005;24 (3):843-853.
55. Daugherty JD, Blake SC, Kohler SS, et al. Quality improvement training: experiences of frontline staff. *International journal of healthcare quality assurance* 2013;26 (7):627-641.
56. Shojania KG, Silver I, Levinson W. Continuing medical education and quality improvement: a match made in heaven? *Annals of internal medicine* 2012;156 (4):305-308.
57. Wong BM, Levinson W, Shojania KG. Quality improvement in medical education: current state and future directions. *Medical education* 2012;46 (1):107-119.
58. Coffield F, Mosely D, Hall E, Ecclestone K. *Learning Styles and Pedagogy in Post-16 Learning: A systematic and critical review*. London: Learning Research and Skills Center, 2004.
59. Rimanoczy I, Turner E. *Action reflection learning: Solving real business problems by connecting learning with earning*. Davies-Black Publishing, 2008.
60. Sofo F, Yeo RK, Villafaña J. Optimizing the learning in action learning: reflective questions, levels of learning, and coaching. *Advances in Developing Human Resources* 2010;12 (2): 205-224.

61. Pronovost PJ. Navigating adaptive challenges in quality improvement. *BMJ quality & safety* 2011;20 (7):560-563.
62. Lamm SL. Doctoral dissertation: The connection between action reflection learning and transformative learning: An awakening of human qualities in leadership. Columbia: Teachers college, 2000.
63. Boud D, Walker D. Promoting reflection in professional courses: The challenge of context. *Studies in higher education* 1998;23 (2):191-206.
64. Hesse F, Care E, Buder J, Sassenberg K, Griffin P. A framework for teachable collaborative problem solving skills. In: Griffin P, McGaw B, Care E. *Assessment and teaching of 21st century skills*. Dordrecht: Springer, 2015:37-56.
65. Boud D, Cohen R, Walker D. *Using experience for learning*. Buckingham, United Kingdom: Open University Press, 1996.

## Summary



## Summary

This thesis focuses on the connection between learning and quality improvement in health care. I explored this from the macro, meso and micro level perspectives. The central research question of this thesis is:

**Which issues support and hinder the development of healthcare professionals working in hospitals in their quality improvement work?**

To investigate how healthcare professionals can be supported in their quality improvement work, I employed a case study methodology. I studied three different cases over the course of five years. The first case was the national Dutch Faster Better programme. The second case was a number of different improvement projects in an academic hospital. For the third case I was intensively involved for a period of 18 months in a Dutch teaching hospital. In all three cases I used different methods for data collection and data analysis, varying from quantitative analyses of questionnaires to action research. By combining different research methods I gained more insight into the complexity associated with healthcare professionals' learning to conduct improvement work.

In order to carry out research into quality improvement work, one must first specify what quality actually is. Literature showed that the concept of **quality** is a complex phenomenon, since there is no universally accepted definition of quality and nor is there a universal set of quality dimensions. The same applies to the concept of **quality of health care**. Depending on one's role and position in the healthcare system, different aspects of quality are seen as having a greater or lesser degree of importance. These diverse perspectives influence improvement work, because people have different ideas about what to improve and where to start. Often quality aspects are complementary and can be combined in improvement work, but sometimes different aspects cannot be combined. For example, improving patient-centeredness and increasing organizational efficiency; sometimes increasing patient-centeredness leads to decreased organizational efficiency. Such tensions need to be balanced between the different stakeholders involved. The Dutch healthcare system is characterized by having many stakeholders with sometimes differing views on which aspects are important. Patients (representative organizations), health insurance companies, professional bodies, governmental actors such as the Healthcare Inspectorate, Dutch Healthcare Authority and National Institute for Healthcare Quality are influential stakeholders which all request hospitals to make improvements in

quality of health care. To influence the quality agenda of hospitals, laws are created, regular inspections are carried out by the inspectorate, external audits are performed and hospitals must be accountable for quality of care on the basis of performance indicators. Balancing the demands of these different stakeholders requires healthcare professionals to gain a deeper understanding of the definition of quality of care across the different levels of our healthcare system (macro, meso micro) and from the perspectives of the diverse roles/positions (patients, insurers, inspectorate). Contrasting definitions of quality of care also exist within individual hospitals. Different organizational layers within the hospital (Supervisory Board, Board of Directors, middle management, professionals), individual disciplines (medical specialists, nurses, poli-clinic employees, paramedics etc) and departments (surgery, obstetrics, oncology etc) all impose different demands on quality of health care. When there are so many diverging ideas about the importance of different aspects, one can ask: *How do organizations with a mediating role between hospitals and the national government, and vice versa, influence the development of healthcare professionals in order to perform quality improvement work in hospitals?*

In the Netherlands, professional associations and consultancy firms (such as the Dutch Institute of Quality Improvement, the CBO) support quality improvement activities at hospital level via (national) improvement programmes and projects. The methods and resources which they employ for this purpose are diverse. One can think of Business Process Redesign, Theory of Constraints, Six Sigma, Lean, Clinical Pathways, Breakthrough and so forth. In certain aspects these methods use different approaches, but in essence all of them utilize a systematic improvement process (based on Deming's Plan-Do-Study-Act). All methods employ a fundamental process of continued improvement which leads to incremental organizational development. By understanding what the problem is and how processes and supporting systems within the organization can be modified, healthcare professionals learn to initiate a process of permanent quality improvement. These quality improvement methods thereby focus not only on the actual improvement of healthcare quality, but also on the training and development of healthcare professionals to enable them to set this process in motion. Healthcare professionals need to learn to assess their daily working practices and where necessary to change these towards the desired situation. However, systematic reviews of scientific articles show that little research has been conducted into the actual training and development of healthcare professionals in order to carry out this quality improvement work. It is clear that there is insufficient knowledge of *Which factors hinder or benefit healthcare professionals in their learning to perform quality improvement work?*

One method commonly used for the simultaneous training of healthcare professionals and improvement of health care quality is the so-called 'Quality Improvement Collaborative'. In such a collaborative, several healthcare organizations work together using the Breakthrough methodology to achieve substantial improvements in relation to a specific subject. An example of such a subject could be the reduction of access time or the reduction of bedsores in patients, or decreasing the number of hospital-acquired infections. From a learning perspective, a collaborative can be seen as a 'community of practice', a temporary learning network of professionals whose aim is to transform the organizations involved into learning organizations. In these learning organizations quality improvement work is seen as part of daily practice and all kinds of structures and systems are in place to support this. However, despite the popularity of collaboratives, both in the Netherlands and beyond, there is inconclusive evidence for their effectiveness: some research shows improvement in quality of care, while other research indicates that in the long term the collaboratives' results are minimal. The assumption is that these disappointing long terms results occur primarily because the professionals involved have not sufficiently taken the material on board and made it their own. The educational/development side of collaboratives has hardly been researched at all. Knowledge is lacking on which learning environments and educational content are most important and effective, although it is known that all kinds of quality improvement training courses, workshops, conferences etc are offered. Much has already been written about the content of quality training or the role quality plays in the curriculae of professional education. Unfortunately however, only a small number of articles describe the actual results of the quality training and not a single research project has been undertaken into the development of the competencies necessary to really bring about quality improvements. So I asked myself: *'How can a learning environment contribute to the development of healthcare professionals in order for them to perform quality improvement work in their own hospitals?'*

My research therefore concerns the way in which we can train healthcare professionals to achieve improvements in healthcare quality. In order to research this it is necessary to define 'learning' in further detail. This is especially important because learning and improvement activities in the context of quality improvement are intertwined and both follow a cyclical process. In this thesis learning is understood to be: all processes which lead to a **change of knowledge, skills, attitudes, opinions, and competences** with the aim of applying this in activities. Learning comprises the content (**what**), the process (**how**) and the motivation (**why**). Learning can take place individually, in collaboration with others, and at the organizational level. Learning can involve:

- Individual internal learning processes and interaction with others.
- Formal education and training and implicit learning processes.
- Conscious and goal-oriented learning and subconscious and incidental learning.
- Direction by trainers/teachers and self-directed.
- Utilizing explicit and tacit (subconscious) knowledge.
- Tapping into single and multiple learning styles.
- Aiming for first, second and third order learning.

To answer the central research question I carried out research for a duration of five years. In three different cases I investigated from different perspectives how we can teach healthcare professionals to improve their own activities. In the different cases I unearthed various pieces of the puzzle. In the following paragraphs these different puzzle pieces are explained.

In the EU funded QUASER research into hospital quality I studied the **macro context**: the healthcare system. I researched **organizations which fulfil an intermediary role** (see *Chapter 3*). These kinds of organizations link hospitals and the national government; in the Dutch system these are often semi-governmental organizations, such as the inspectorate. I attempted to discover how these intermediary organizations influence, support and steer healthcare professionals in their quality improvement work. Data (document analysis and 89 semi-structured interviews within 57 different organizations) was gathered in five European countries: England, Norway, Sweden, Portugal and The Netherlands. I explored what the dominant governance models are in the different healthcare systems and what influence this has on quality improvement. Next to this I studied how three commonly used quality improvement methods are applied to influence hospitals from the outside: accreditation, quality improvement guides and performance indicators. My findings revealed that the way in which these methods are used and the consequences of this for quality work in hospitals varies vastly between countries. The aim (why), the actors involved and who gives the impetus (who), and the methods or forms used (what) differ. On the basis of this research I conclude that the organization of the healthcare system has a huge influence on the way in which quality improvement work is steered and supported. Our Dutch system with all the different actors with sometimes differing demands requires coherence and coordination. If this does not occur sufficiently at the national level, it must be taken up at hospital level, otherwise healthcare professionals become overloaded with new initiatives.

The **meso level** was studied in the Faster Better quality improvement programme, which was subsidized by the Dutch Ministry of Health, Wellbeing and Sport. Its

aim was to achieve substantial improvements in Dutch hospitals through the implementation of best practices. At the core of the Better Faster programme was the formation of a temporary learning system (quality improvement collaborative) in which 24 hospitals learned how to achieve quality improvement. In this learning system healthcare professionals learned new change and improvement methods and had the opportunity to experiment with these in their own hospitals. During the Faster Better programme I was assigned to three hospitals as an adviser: two general hospitals and one academic hospital. In these hospitals I carried out action research into the training/educational components of Faster Better and how this training of healthcare professionals influenced the improvement work in the hospitals.

I conclude on the basis of my research into Faster Better that from a technical perspective the conditions required to create a learning organization were present. However, from a social perspective considerable challenges still remained. (see *Chapter 4*). The approach of the Faster Better programme led to problems with the different disciplines, because they had different expectations compared with what was offered in the educational/training components. Furthermore, all kinds of problems arose related to the **set goals of the Faster Better programme**. In addition, the collective learning as a team/work group was not easy for many participants.

Supplementary to these insights I deepened this research by exploring the **learning style preferences** of the Faster Better participants (see *Chapter 4*). 124 participants (83.5% response rate) from the collaboratives Advanced Access (aiming to reduce access time) and Process Redesign (aiming to reduce throughput time) completed the learning style questionnaire of Manon Ruijters and Robbert Jan Simmons. On the basis of this I revealed that the most preferred learning styles of the participants were **Discovery of new insights** and **Participation with others**. The learning style Acquisition of knowledge was moderately preferred and Apperception from others and Exercising in fictitious situations were least preferred. Only slight differences in learning style preference were found based on age, gender, professional background and project role. Unfortunately the Faster Better learning environments, such as national conferences, half-day peer-learning sessions, site visits from the leaders of the collaborative and use of an online tool, were primarily aligned with Acquisition and Apperception. Neither of these learning styles were the dominant preference of the participants.

Next I looked at the **content of the learning**: what knowledge and skills do healthcare professionals need in order to accomplish logistic improvements in their hospitals (see *Chapter 6*). Using the **Delphi Method**, scientific and experienced experts helped me to determine which skills are important. This resulted in a list of 18 skills for Advanced Access (reducing access time) and 21 skills for Process Redesign (reducing throughput time). The participants of both Faster Better col-

laboratives completed a questionnaire which asked them whether these skills: 1) were **important**, 2) were **available** and 3) **increased** during Faster Better. Based on 121 completed questionnaires (68.8% response rate) I concluded that the respondents agreed with the findings of the Delphi study, scoring all skills as important. They felt that project management and change management skills were lacking and that analytical skills increased the most. The skills required for the primary goal of the improvement projects (reducing access and throughput times) only increased to a limited degree. Data gathered with action research helped to understand the consequences that this lack of alignment with the dominant learning style and the limited development of skills had on participation in Faster Better (see *Chapters 4 – 6*). The data showed that the **participants' satisfaction** with the educational approaches offered **changed** in the course of the programme. During national meetings in Faster Better, much use was made of presentations by experts (Acquisition of knowledge) and by experienced peers (Apperception). Initially these presentation were well-received, and generated enthusiasm and motivation to change. The stories from the experienced peers showed that improvement is achievable, and in the presentations by the experts it was clearly explained what was necessary to do to achieve the desired improvements. However, in the course of time the participants became less satisfied with these stories and presentations, because they felt that that they made it all sound too easy. The stories and presentations didn't fit sufficiently with the problems that the participants were facing in their own hospitals. The consequence of this was that the participants were less motivated to attend the national meetings, because insufficient attention was given to the 'softer' skills necessary for change, such as motivating colleagues or transferring knowledge and skills to others. Next to this, the participants tended to be less inclined to stick to the national goals and many teams also moved away from using the Faster Better handbook. They sought, in accordance with their dominant learning style Discovery, their own way.

It is scientifically interesting to conclude that it didn't work as well as it could have, but also practically-speaking it is relevant to bring forward ideas about how things could be improved. In two meetings with experts (professors in logistics and the programme leaders of Faster Better), the results of the research were presented. The experts then brainstormed about possible causes and solutions. The first of these was that Faster Better paid too little attention to the skill of transferring knowledge to others, adjusting logistic principles to the specific situation, and inter-project learning. As a second point the experts suggested that a process-oriented learning approach, learning as a team, would be more stimulating and would therefore make the learning process easier. The experts felt that, if transfer of knowledge and skills was improved, healthcare professionals would be in a better position to achieve the desired results.

The results of the Faster Better research helped the programme leaders of other collaboratives and other improvement project leaders to set up learning environments which fitted the preferred learning style of the participants. It also helped them to pay more attention to the content of the programme, in order that it would give maximum support to the participants in their improvement work.

At the **micro level** I studied two different improvement topics. The first was a commonly used improvement approach: the development of care pathways, also known as clinical pathways. The second aimed at the reduction of hospital-acquired infections by improving hand hygiene practice.

In an academic hospital I studied ten work groups involved in developing and implementing a **care pathway** (see *Chapter 7*). Care pathways are seen in the scientific literature as complex interventions for change aiming to enhance quality of care. A care pathway focuses on the standardization (in terms of content and organization) of the way in which care is provided for a well-defined group of patients. With care pathways risks to patients are reduced, safety and patient satisfaction is increased and more efficient use of manpower and resources is strived for.

In the Netherlands care pathways are mostly developed in **work groups**/project groups/project teams. These work groups consist of employees contributing on behalf of different departments or professional disciplines. During a 14 month long **action research** study I explored the key **challenges** which these multidisciplinary work groups faced during the development and implementation of the care pathway. An important point of attention in this research was how work group members learnt to deal with the problems they encountered. The research revealed **14 frictions**. Frictions are issues which affect, whether positively (constructively contributing) or negatively (destructively hindering), the development and implementation of a care pathway. Three frictions were related to the internal dynamics within the work group, such as 1) personal interests which conflicted with the aim of the care pathway, 2) insufficient 'manpower' and time for all the work that needed to be done, and 3) having the opportunity to share emotions when things got really difficult. I also found frictions related to how the work group members could influence and engage other colleagues:

1. Use a vision or ambition for the future rather than specific goals.
2. Use narratives and visuals (of data) in the communication.
3. Use knowledge about assumptions/prejudices within the organization to adapt your communication to the different target groups, so that employees are willing to keep to the new way of working.
4. Ensure that all work group members give feedback to employees, despite differences in culture, (power)status and role in the organization. By

making use of written agreements it is easier to give feedback, because then feedback is not associated with personal opinions, but on previously formed agreements.

5. Organize learning spaces to reflect on the development and implementation of the care pathway, so that work group members can make the lessons learnt explicit and can apply them in other places.

Other frictions were related to the role of management in getting other employees on board and communicating the goals they are striving for with care pathways.

The second subject which I studied as an example of improvement work was the reduction of infections occurring in hospitals, the so-called hospital-acquired infections. **Hospital-acquired infections** are a persistent problem that cause pain and discomfort and threaten patients' health. Moreover, hospital-acquired infections result in an increase in costs. The causes of these infections and the steps healthcare professionals must take in order to prevent them is well known. The most important prevention measure is improving hand hygiene practice (the right method at the right time). Educating healthcare professionals and increasing the availability of disinfectant dispensers are the most important improvement methods. However, despite all the attention for and training in this subject, the hand hygiene practice of healthcare professionals remains woefully poor. Improvement in hand hygiene requires a change in routine behaviour and that is not so easy to achieve. In the first study (see *Chapter 8*) a **screen saver** was used in a 27-bed paediatric intensive care unit to bring to the attention of employees the **benefits of good hand hygiene**. By highlighting the benefits of complying instead of the disadvantages or risks of not complying with procedures, people are subconsciously influenced to adapt their behaviour. During the study I employed electronic devices to measure the frequency at which the hand alcohol dispensers were used, and employees were observed. The research revealed that during the time that the messages were displayed on the screen saver, the frequency at which employees disinfected their hands increased.

In the QUASER research mentioned previously I studied together with my colleagues from the other countries how hospitals across Europe work on reducing hospital-acquired infections (see *Chapter 9*). In addition, we studied how our insights might contribute to how (European) countries could learn from each other. In five hospitals, one in each country, we followed improvement projects aimed at reducing hospital-acquired infections. On the basis of observations, documentation and semi-structured interviews, I identified three methods that are used in all five countries for reducing hospital-acquired infections: 1) the use of visuals in giving feedback to healthcare professionals 2) spreading different kinds of knowledge and ensuring that this knowledge is relevant to the specific

situation, and 3) supporting the process of learning from each other (between different organizational levels, departments and disciplines). Despite these similarities between the five countries, I concluded that inter-country learning is complicated. Every country has a different dominant method for quality improvement and in order for countries to learn from each other it is crucial to take into consideration their different healthcare systems.

With this thesis I would like to contribute to the improvement of both theory and practice by spreading knowledge about the issues which hinder and support the development of healthcare professionals in order to perform improvement work. The three case studies provided me with further insight into the dynamics around the way we in the Netherlands deal with quality improvement in hospitals. In my combined role as adviser and researcher in all cases I had greater access to meaningful and relevant data which I would not have been able to obtain in solely a research role. By using action research I obtained greater insight into what was actually happening, as opposed to what people say that they do (as happens in interviews). Healthcare professionals and advisers seemed keen to be involved in my research and were often highly motivated to support me by gathering data in a valid and reliable way. They often gave me direct feedback on my findings or helped me, with their questions, to explore my data even more deeply in order to understand what the problem was or what the 'active element' was in this situation. Furthermore, they were also prepared to try out my ideas on how things could be done better (on the basis of data analysis) and together to discover what the effects of this were.

In summary, I have learned that the usual way to perform improvement work in the Netherlands is via projects. The current assumption is that when we teach healthcare professionals to perform quality improvement work, the project team members can change the context (structures, cultures, employees), while they are working on the improvement goal. Unfortunately however, this study shows that the current way in which we 'educate' healthcare professionals doesn't fit with their preferred learning style. Furthermore, the skills which we try to develop in the professionals don't include all the skills which they consider important and necessary to achieve sustained change. This study shows that particularly project management and change management skills must be given more attention. Next to this I learnt that from a social perspective the conditions for creating a learning organization are still not sufficiently developed. Moreover I conclude that the way in which we organize improvement projects particularly supports **first-order learning**: solving the problem or perfecting what is already there. Sometimes first-order learning is enough, because the problem is sufficiently clear enough and the solution is obvious. An example of this would be improving

hand hygiene to reduce hospital-acquired infections. When this is the case, it is not necessary to start an improvement project. My research shows that in such cases other methods can also be effective, such as displaying messages on a screensaver. Unfortunately however, most quality improvement goals are not so easy to achieve, because the context in which the problem lies is complex and the problem is not so easy to fathom. For these types of goals, **second or third order learning** is necessary. Second and third order learning involves exploring the dominant presumptions and opinions (mental models or thought frameworks) about oneself, the task, the situation and other involved parties. By expanding one's thought frameworks, other observations can be made and interpreted differently, problems can be defined differently and through this the way in which people behave changes.

As adviser, work group coach and team coach and as member of the programme team I learnt how to stimulate learning. I developed more feeling for the way in which improvement goals can be achieved, and also how I can pass on skills, in particular project management and change management skills. By creating environments in which Discovery and Participation learning styles flourish, healthcare professionals and advisers start communicating with each other about their assumptions/thought frameworks and their views about acquired experiences.

I also learnt the importance of healthcare professionals collectively testing, with the help of experiments, the various methods of achieving the desired improvements. This experimentation ensures that there is an organizational development process based on continuous initiation and incremental improvements.

During this research I also learnt a great deal about to conduct good quality research in the role of adviser. In a reciprocal process between science and practice I experienced as researcher certain tensions. Are you primarily loyal to the science to ensure good data or do you especially want to help in practical terms? I discovered four ways to deal with this conflict. Firstly, in conversation with healthcare professionals I tried as much as possible to use their words, images and metaphors rather than my own. In this way I remained close to my data and avoided making all kinds of additions. As adviser this is also helpful, because you link with their experiences and feelings. Secondly, I primarily presented my findings as researcher as possible ways to look at the problems, possible ways to make improvements. As a scientist this often delivers the most interesting discussions about the data (member checking) and you quickly see where extra analysis is necessary. This also helped me as adviser, because suggestions of ways of looking differently feel like advice for the healthcare professionals. I noticed that I received less defensive responses where employees became defensive or tried to persuade me that they were right. Thirdly, by using humour and by explicitly positioning myself as a part of their team, I could more easily share my findings. By clearly indicating that it was our problem and our way of slaying the dragon,

it was easier to give employees insight into the data. Fourthly, I was sure to point out the value of the things that were already working really well. As adviser I could then strengthen what was already present. In this way the negativity which sometimes comes with improvement work was compensated. Also in my role as scientist it helped to look at what was evidently working well.

## Notes

<sup>1</sup> Although the term 'I' is used here, it actually means 'we', since I have never worked alone on this research. The 'we' comprises all the healthcare professionals and managers involved in the research and especially my scientific colleagues with whom I discussed the research data.



## **Samenvatting**



## Samenvatting

De samenhang tussen leren en kwaliteitsverbetering in de gezondheidszorg staat centraal in dit proefschrift. Ik onderzoek deze samenhang vanuit een macro, meso en micro perspectief. De centrale onderzoeksvraag was:

***Wat bevordert en wat belemmert de ontwikkeling van zorgprofessionals werkzaam in een ziekenhuis, die zich bezig houden met kwaliteitsverbeteringen?***

Om te onderzoeken hoe zorg professionals kunnen worden ondersteund in hun kwaliteit verbeteractiviteiten, gebruikte ik de casestudy onderzoeksmethode. Ik <sup>1</sup> onderzocht drie verschillende casussen in 5 jaar. De eerste casus was het nationale Sneller Beter verbeterprogramma. De tweede casus was een aantal verschillende verbeterprojecten in één academisch ziekenhuis. Voor de derde casus was ik gedurende 1,5 jaar intensief betrokken één Nederlands opleidingsziekenhuis. In alle drie de casussen gebruikte ik voor de data verzameling en data analyse verschillende methoden, variërend van kwantitatieve analyses van vragenlijsten tot aan actie onderzoek. Door verschillende onderzoeksmethoden te combineren kreeg ik meer inzicht in de complexiteit die samenhangt met het leren uitvoeren van kwaliteit verbeteractiviteiten door zorg professionals.

Als je onderzoek wilt doen naar kwaliteit verbeteractiviteiten, moet je eerst bepalen wat kwaliteit is. Literatuur laat zien dat het begrip **kwaliteit** een complex begrip is, omdat er geen universeel geaccepteerde definitie over kwaliteit bestaat. Ook is er geen algemeen geaccepteerde set van aspecten die samenhangen met kwaliteit. Hetzelfde geldt ook voor **kwaliteit van zorg**. Afhankelijk van jouw rol en de positie in het gezondheidszorg systeem worden andere aspecten van de kwaliteit van zorg meer of minder belangrijk gevonden. Deze verschillende perspectieven beïnvloeden verbeteractiviteiten, omdat mensen verschillende ideeën hebben over wat verbeterd moet worden en waarmee dus gestart moet worden. Vaak zijn de verschillende aspecten complementair en kunnen zij gecombineerd worden in verbeteractiviteiten, maar soms zijn verschillende aspecten niet te combineren. Bijvoorbeeld het verbeteren van de patiëntgerichtheid en het verhogen van efficiëntie; soms leidt meer patiëntgerichtheid tot inefficiëntie. De Nederlandse gezondheidszorg wordt gekenmerkt door veel verschillende belanghebbenden, die soms verschillende aspecten belangrijk vinden. Patiënten(vertegenwoordigers), zorgverzekeraars, beroepsverenigingen en overheidsdiensten zoals de Inspectie voor de Gezondheidszorg, NZA en het Zorginstituut vragen aan ziekenhuizen om de kwaliteit van zorg te verbeteren. Om de kwa-

litateitsagenda van ziekenhuizen te beïnvloeden worden wetten gemaakt, doet de inspectie regelmatig onderzoek, worden externe audits gedaan en moeten ziekenhuizen op basis van indicatoren verantwoording afleggen over de kwaliteit van zorg. Het balanceren tussen die verschillende belanghebbenden vraagt van zorgprofessionals dat zij meer begrip hebben over de definiëring van kwaliteit van zorg door de verschillende niveaus in ons zorgstelsel (macro, meso, micro) en vanuit de diverse rollen/posities (patiënten, verzekeraars, inspectie). Verschillende definities voor kwaliteit van zorg zijn ook aanwezig binnen een ziekenhuis. Zo, stellen de verschillende organisatielagen in een ziekenhuis (Raad van Toezicht, Raad van Bestuur, midden managers, professionals) en verschillende disciplines (medisch specialisten, verpleegkundigen, polikliniek medewerkers, paramedici enzovoorts) en afdelingen (chirurgie, verloskunde, oncologie enzovoorts) andere eisen aan de kwaliteit van zorg. Als er zoveel verschillende ideeën zijn over welke aspecten van belang zijn kun je je afvragen: ***Hoe beïnvloeden organisaties -die een rol spelen om te mediëren tussen ziekenhuizen en de nationale overheid en vice versa- het leren uitvoeren van kwaliteit verbeteractiviteiten door zorg professionals in ziekenhuizen?***

In Nederland ondersteunen organisatie-advies bureaus (zoals het CBO) en beroepsverenigingen met (nationale) verbeterprogramma's en projecten de kwaliteit verbeteractiviteiten op ziekenhuisniveau. De methoden en hulpmiddelen die zij daarvoor gebruiken zijn divers. Te denken valt aan Business Process Redesign, Theory of Constraints, Six Sigma, Lean, Klinische Paden, Doorbraak enzovoorts. Deze methoden hebben op onderdelen verschillende aanpakken, maar in essentie gaan ze allemaal uit van een systematisch verbeterproces (gebaseerd op Deming's Plan-Do-Study-Act). Alle methoden hanteren als basis een proces van continue verbeteren die leidt tot incrementele organisatie ontwikkeling. Door te begrijpen wat het probleem is en hoe processen en ondersteunende systemen in de organisatie kunnen worden aangepast leren zorgprofessionals een proces van permanente kwaliteitsverbetering op gang te brengen. Deze kwaliteit verbetermethoden richten zich daarmee dus niet alleen op het daadwerkelijk verbeteren van de kwaliteit van zorg, maar ook op het 'opleiden' van zorgprofessionals om dit proces op gang te krijgen. Zorgprofessionals moeten leren om hun dagelijkse praktijk te beoordelen en die indien nodig te veranderen richting de gewenste situatie. Systematische reviews van wetenschappelijke artikelen laten zien dat er weinig onderzoek is gedaan naar het 'opleiden' van zorgprofessionals om kwaliteitsverbeterwerk uit te voeren. Onvoldoende is nog duidelijk ***Welke factoren belemmeren of bevorderen zorgprofessionals in het leren uitvoeren van verbeteractiviteiten?***

Een van de methoden die veel gebruikt wordt voor het opleiden van zorgprofessionals en tegelijkertijd verbeteren van de kwaliteit van zorg is een zogenaamde 'quality improvement collaborative'. In een collaborative werken verschillende zorgorganisaties samen en gebruiken ze de Doorbraak methode om substantiële verbeteringen te krijgen ten aanzien van een specifiek onderwerp. Bijvoorbeeld het verminderen van de toegangstijd of het verminderen van doorligwonden bij patiënten of verminderen van het aantal ziekenhuisinfecties. Vanuit een leerperspectief kan een collaborative gezien worden als een 'community of practice', een tijdelijk leernetwerk tussen professionals, die tot doel heeft om de betrokken organisaties te veranderen in lerende organisaties. In deze lerende organisaties zijn kwaliteit verbeter activiteiten onderdeel van het dagelijkse werk en zijn allerlei systemen en structuren aanwezig om dit te ondersteunen. Ondanks de populariteit van collaboratives, zowel in Nederland als andere landen, is er onduidelijk wetenschappelijke bewijs voor hun effectiviteit. Sommige onderzoeken laten verbeteringen van de kwaliteit van zorg zien, andere onderzoeken laten zien dat op de langere termijn de resultaten gering zijn. De aanname is dat dit vooral komt doordat de betrokken professionals zich onvoldoende de materie eigen hebben gemaakt. De educatieve/ontwikkelingskant van collaboratives is heel beperkt onderzocht. Kennis ontbreekt over welke leeromgevingen en leerinhoud belangrijk zijn. Kennis is wel aanwezig over allerlei opleidingen, workshops, conferenties over kwaliteit verbeteractiviteiten. Er is al veel geschreven over de inhoud van kwaliteitsopleidingen of welke rol kwaliteit speelt in het curriculum van beroepsopleidingen. Helaas beschrijven maar een paar artikelen het resultaat van die kwaliteitsopleidingen en is nog geen onderzoek gedaan naar de ontwikkeling van competenties die nodig zijn om kwaliteitsverbeteringen te bewerkstelligen. Ik vraag mij dus af: *Hoe kan een leeromgeving bijdragen aan de ontwikkeling van zorgprofessionals om kwaliteitsverbeteringen te bewerkstelligen in eigen ziekenhuis?*

Mijn onderzoek ging dus over de manier waarop we zorgprofessionals kunnen leren om verbeteringen in de kwaliteit van zorg te realiseren. Om dat te kunnen onderzoeken is het ook nodig om leren nader te definiëren. Dit is vooral van belang, omdat leren en verbeteractiviteiten in kwaliteit verbeteractiviteiten elkaar vervlochten zijn en beiden een cyclisch proces volgen. In dit proefschrift wordt onder leren verstaan: alle processen die leiden tot een verandering in de **kennis, vaardigheden, houding, mening en competenties** met als doel dit **toe te passen** in activiteiten. Leren omvat de inhoud (**wat**), het proces (**hoe**) en motivatie (**waarom**). Leren vindt op individueel niveau plaats, in samenwerking met anderen en op organisatie niveau. Leren kan betrekking hebben op:

- Individuele interne leerprocessen **en** in interactie met anderen.
- In formele opleidingen **en** impliciete leerprocessen.
- Bewust en doelgericht **en** onbewust en toevallig.
- Vanuit opleiders/onderwijzers georganiseerd **en** door zelfsturing.
- Door expliciete **en** tacite (onbewuste) kennis te gebruiken.
- Sluit aan op enkele **en** meerdere leerstijlen.
- Met als doel eerste, tweede **en** derde orde leren te stimuleren.

Om antwoord te geven op de centrale onderzoeksvragen deed ik gedurende vijf jaar onderzoek. In drie verschillende casussen onderzocht ik vanuit verschillende perspectieven hoe we zorgprofessionals kunnen leren om hun eigen werkzaamheden te verbeteren. In de verschillende casussen vond ik stukjes van de puzzel. In de volgende paragrafen worden de verschillende puzzelstukjes toegelicht.

In het door het Europese Unie gesubsidieerde QUASER onderzoek naar kwaliteit in ziekenhuizen onderzocht ik de **macro context**: het gezondheidszorg systeem. Ik deed onderzoek naar **organisaties die een intermediërende rol** vervullen (zie **hoofdstuk 3**). Dit soort organisaties verbinden de landelijke overheid en ziekenhuizen; vaak zijn dit in het Nederlandse systeem semi-overheidsorganisaties, zoals de inspectie. Ik probeerde te ontdekken hoe die intermediërende organisatie zorgprofessionals beïnvloeden, ondersteunen en sturen in hun kwaliteitsactiviteiten. Data (documenten analyse en 89 semi-gestructureerde interviews met 57 verschillende organisatie) werd verzameld in vijf Europese landen: Engeland, Noorwegen, Zweden, Portugal en Nederland. Ik keek naar wat het dominante governance model was in de verschillende systemen en welke invloed dit had op kwaliteitsverbetering. Daarnaast onderzocht ik hoe drie veel gebruikte methoden werden ingezet om ziekenhuizen van buitenaf te beïnvloeden: accreditatie, indicatoren en handleidingen. Ik ontdekte dat hoe die methoden werden gebruikt en de gevolgen die dit had voor kwaliteitsactiviteiten in ziekenhuizen tussen de landen uiteenliep. Het doel (waarom), de betrokken actoren en wie een verbeterimpuls geeft (wie) en de methode of verschijningsvorm (wat) verschilde. Op basis van dit onderzoek concludeer ik dat de **organisatie van het zorgsysteem van grote invloed is op de manier waarop je kwaliteitsactiviteiten** kunt aansturen en ondersteunen. Het Nederlandse zorgsysteem met alle verschillende actoren met soms verschillende eisen vraagt om het aanbrengen van samenhang en afstemming. Als dit onvoldoende op landelijk niveau gebeurt, moet dit binnen ziekenhuizen opgepakt worden, anders raken zorgprofessionals overladen met nieuwe initiatieven.

Het **meso niveau** werd onderzocht in het nationale **Sneller Beter** kwaliteitsverbetering programma. Sneller Beter werd gesubsidieerd door het Ministerie

van VWS en had tot doel het realiseren van substantiële verbeteringen in Nederlandse ziekenhuizen door het implementeren van best practices. De kern van Sneller Beter was het opzetten van een tijdelijk leer-systeem (een quality improvement collaborative) waarin 24 ziekenhuizen leerden om kwaliteitverbeteringen te realiseren. In dit leer-systeem leerden zorgprofessionals nieuwe verbeter- en verandermethoden en kregen zij de mogelijkheid om daarmee te experimenteren in hun eigen ziekenhuis. Ik was adviseur van drie ziekenhuizen tijdens Sneller Beter: twee algemene ziekenhuizen en één academisch ziekenhuis. In deze ziekenhuizen deed ik actie onderzoek naar de opleidingskant van Sneller Beter en hoe de educatie van zorgprofessionals de verbeteractiviteiten in de ziekenhuizen beïnvloedde.

Ik concludeer op basis van mijn onderzoek naar Sneller Beter dat de voorwaarden voor een lerende organisatie vanuit een technisch perspectief bekeken aanwezig waren. Echter, vanuit een sociaal perspectief waren er nog behoorlijk veel uitdagingen (zie **hoofdstuk 4**). De aanpak van Sneller Beter leidde tot problemen met de verschillende disciplines, omdat zij andere verwachtingen hadden ten aanzien van het onderwijsaanbod. Daarnaast ontstonden allerlei problemen die samenhangen met **de gestelde doelen vanuit het Sneller Beter** programma. Ook was het gezamenlijk leren als team/werkgroep voor veel deelnemers niet zo eenvoudig.

In aanvulling op deze inzichten verdiepte ik dit onderzoek door te kijken naar de **leerstijl voorkeur** van de Sneller Beter deelnemers (zie **hoofdstuk 4**). 124 deelnemers (83.5% respons) van de collaborative Werken zonder Wachten (toegangstijd verminderen) en Herontwerpen van processen (doorlooptijd verminderen) vulden de leerstijlen vragenlijst van Manon Ruijters en Robbert Jan Simons in. Op basis hiervan concludeer ik dat **Participatie met anderen en Ontdekken van nieuwe inzichten** de leerstijl voorkeur is van de deelnemers. De leerstijl Kennis verwerven werd matig gewaardeerd en de Kunst afkijken bij anderen en Oefenen in fictieve situaties het minst. Kleine verschillen in de leer voorkeur werden gevonden op basis van leeftijd, sexe, discipline en project rol. Helaas werden de Sneller Beter leeromgevingen - zoals landelijke conferenties, korte intervisie bijeenkomsten, werkbezoeken van de collaborative leiders en een website - vooral op basis van Kennis verwerven en Kunst afkijken ingericht. Beide leerstijlen waren niet de dominante leervoorkeur van deelnemers.

Vervolgens keek ik ook naar de **inhoud van het leren**: welke kennis en vaardigheden hebben zorgprofessionals nodig om (logistieke) verbeteringen te realiseren (zie **hoofdstuk 6**). Met behulp van de **Delphi methode** hielpen zowel wetenschappelijke als ervarings-experts mij om te bepalen welke vaardigheden belangrijk zijn. Dit resulteerde in een lijst van 18 vaardigheden voor Werken zonder Wachten (toegangstijd verminderen) en 21 vaardigheden voor Herontwerpen van processen (doorlooptijd verminderen). De deelnemers van beide Sneller

Beter collaboratives vulden **een vragenlijst** in waarbij ik hen vroeg of deze vaardigheden 1) **belangrijk** waren 2) **aanwezig** waren en 3) **toegenomen** waren tijdens Sneller Beter. Gebaseerd op 121 ingevulde vragenlijsten (68.8% respons) concludeer ik dat de mensen die de vragenlijst invulden het eens waren met de uitkomsten van het Delphi onderzoek; ze vonden alle vaardigheden belangrijk. Zij vonden dat de projectmanagement en veranderkundige vaardigheden onvoldoende aanwezig waren en de vaardigheden om te analyseren het meeste toenamen. De vaardigheden voor het primaire doel van het verbeterproject (toegangstijd en doorloop verminderen) namen maar heel beperkt toe.

Data verzameld met **actie onderzoek** hielp om te begrijpen welke gevolgen het niet aansluiten op de dominante leerstijl én beperkte ontwikkeling van vaardigheden had op hun deelname aan Sneller Beter (zie **hoofdstuk 4 tot 6**). Uit de data bleek dat **tevredenheid van de deelnemers** met de aangeboden leeromgevingen in Sneller Beter **veranderde** in de loop van het programma. Tijdens landelijke bijeenkomsten in Sneller Beter werd veel gebruik gemaakt van lezingen, gegeven door experts (Kennis verwerven) en door ervaringsdeskundigen (Kunst afkijken). In het begin werden die lezingen goed ontvangen. Het genereerde enthousiasme en motivatie om te veranderen. Het verhaal van de ervaringsdeskundige liet zien dat het haalbaar was en in de lezing van de experts werd duidelijk uitgelegd wat je moest doen. Echter na verloop van tijd waren de deelnemers niet meer zo tevreden hierover, want zij vonden dat het allemaal veel te makkelijk werd voorgesteld. De lezingen en verhalen sloten onvoldoende aan bij de problemen die zij ervaarden in hun eigen ziekenhuis. Gevolg was dat de deelnemers minder bereid waren om naar de landelijke bijeenkomsten te gaan, omdat daar onvoldoende aanknopingspunten werden geboden ten aanzien van de wat meer 'zachtere' verandervaardigheden, zoals het motiveren van collegae of het overdragen van de kennis aan anderen. Daarnaast waren de deelnemers minder geneigd zich te houden aan de landelijke doelen en weken ook veel teams af van het Sneller Beter handboek. Zij zochten, conform hun dominante leerstijl Ontdekken, hun eigen weg.

Het is wetenschappelijk interessant om te concluderen dat het onvoldoende werkt, maar voor de praktijk is het relevant om ook ideeën aan te dragen over hoe het beter kan. In twee bijeenkomsten met experts (hoogleraren logistiek en de programmaleiding van Sneller Beter) werden de resultaten van het uitgevoerde onderzoek gepresenteerd. De experts brainstormden over mogelijke oorzaken en oplossingen. De eerste was dat in Sneller Beter te weinig aandacht schonk aan het belang van en de vaardigheid om kennis over te dragen, logistieke principes te kunnen aanpassen aan de eigen situatie en inter-project leren. Als tweede suggereerden de experts dat een proces georiënteerde leeraanpak het in teamverband leren meer stimuleert en daardoor het leren makkelijker wordt. De gedachte van de experts was dat als het overdragen van kennis en

vaardigheden beter gaat, zorgprofessionals beter in staat zijn om de beoogde verbeterresultaten te behalen.

De resultaten van het Sneller Beter onderzoek helpt de programmaleiding van andere collaboratives en projectleiders van verbeterprojecten om leeromgevingen in te richten die passen bij de leerstijl voorkeur van de deelnemers. **Daarnaast daagt het hen uit** om meer aandacht te schenken aan de inhoud van het programma, zodat dit de deelnemers maximaal ondersteunt in hun verbeteractiviteiten.

Op **micro niveau** onderzocht ik twee verschillende onderwerpen. Als eerste een veel gebruikte aanpak om verbeteringen te realiseren: zorgpaden, ook wel klinische paden genoemd. Als tweede het verminderen van ziekenhuisinfecties door het verbeteren van de handhygiëne.

In een academisch ziekenhuis onderzocht ik tien werkgroepen die een **zorgpad ontwikkelden en implementeerden** (zie *hoofdstuk 7*). Zorgpaden worden in wetenschappelijke publicaties gezien als een complexe veranderkundige interventie die tot doel heeft de kwaliteit van zorg te verbeteren. Een zorgpad richt zich op het (inhoudelijk en organisatorisch) standaardiseren van de wijze waarop zorg wordt aangeboden aan een afgebakende groep patiënten. Met zorgpaden worden risico's voor patiënten verminderd, veiligheid en patiëntentevredenheid vergroot en gestreefd naar een efficiëntere inzet van mankracht en middelen. In Nederland worden zorgpaden meestal ontwikkeld in **werkgroepen/projectgroepen/projectteams**. Deze werkgroepen bestaan uit medewerkers die namens hun afdeling of beroepsgroep bijdragen. In een veertien maanden durend **actie onderzoek** keek ik naar welke **uitdagingen** deze multidisciplinaire werkgroepen hadden tijdens de ontwikkeling en implementatie van het zorgpad. Belangrijk aandachtspunt in dit onderzoek was hoe werkgroepleden leerden omgaan met de problemen die zich voordeden. Het onderzoek liet **14 fricties** zien. Fricties zijn punten die zowel positief (constructief bijdragend) als negatief (destructief bemerrend) bijdragen aan de ontwikkeling en implementatie van een zorgpad. Drie fricties hadden te maken met de interne dynamiek in de werkgroep, zoals persoonlijke belangen die haaks staan op het doel van het zorgpad, onvoldoende mankracht en tijd hebben voor al het werk dat gedaan worden en de mogelijkheid om emoties te delen wanneer het allemaal niet zo gemakkelijk gaat. Ik vond ook fricties die samenhangen met de manier waarop je collegae kunt betrekken:

1. Gebruik een visie of ambitie voor de toekomst in plaats van specifieke doelen.
2. Gebruik verhalen en beelden (van gegevens) in de communicatie.
3. Gebruik kennis over aannames die leven in de organisatie om je communicatie aan te passen aan de verschillende doelgroepen, zodat medewerkers

- bereid zijn zich te houden aan de nieuwe werkwijze.
4. Zorg dat alle werkgroep leden feedback geven aan medewerkers, ondanks verschillen in cultuur, (macht)status en rol in de organisatie. Door gebruik te maken van schriftelijke afspraken is het makkelijker feedback te geven, omdat feedback niet gebaseerd is op persoonlijke opinies, maar op gemaakte afspraken.
  5. Organiseer leerruimte om te reflecteren op de ontwikkeling en implementatie van het zorgpad, zodat werkgroepleden geleerde lessen expliciet maken en ze kunnen toepassen op andere plekken.

Andere fricties hadden betrekking op de rol van het management in het afstemmen met anderen en communiceren van het doel dat zij met zorgpaden nastreven.

Het tweede onderwerp dat ik als voorbeeld van verbeteractiviteiten onderzocht was het verminderen van infecties die ontstaan in het ziekenhuis, de zogenaamde ziekenhuis gerelateerde infecties. **Ziekenhuisinfecties** zijn een hardnekkig probleem dat pijn en ongemak veroorzaakt en de gezondheid van patiënten bedreigt. Daarnaast zorgen ziekenhuisinfecties voor een toename van de kosten. De oorzaak van deze infecties en wat zorgprofessionals moeten doen om dit te voorkomen is bekend. De belangrijkste verbeteractiviteit is het verbeteren van de handhygiëne (juiste manier en juiste moment). Onderwijs aan zorgprofessionals en zorgen voor meer desinfectans zijn de belangrijkste verbetermethoden. Ondanks dat er veel aandacht en scholing voor het onderwerp is, is de handhygiëne van zorgprofessionals erbarmelijk slecht. Het verbeteren van de handhygiëne vraagt om een verandering van routinematig gedrag en dat is niet zo eenvoudig te realiseren.

In het eerste onderzoek (zie **hoofdstuk 8**) werd op een kinder intensive care (27 bedden) een **screensaver** gebruikt om bij medewerkers het **voordeel van handhygiëne** onder de aandacht te brengen. Door het benoemen van het voordeel in plaats van de nadelen of risico van je niet houden aan de voorschriften worden mensen onbewust beïnvloed hun aan te passen. In het onderzoek maten we met een elektronisch hulpmiddel het aantal keren dat alcoholdispensers werden gebruikt en observeerden we medewerkers. Uit het onderzoek bleek dat tijdens het tonen van deze boodschappen op de screen saver het aantal malen dat medewerkers hun handen desinfecteerden toenam.

In het QUASER onderzoek onderzocht ik samen met mijn collegae uit de andere landen hoe ziekenhuizen werken aan het verminderen van ziekenhuisinfecties (zie **hoofdstuk 9**). In aanvulling daarop onderzochten we hoe onze inzichten kunnen bijdragen aan hoe (Europese) landen van elkaar kunnen leren. In vijf ziekenhuizen – in ieder land één - volgden we een verbeterproject over ziekenhuisinfecties. Op

basis van observaties, documenten en semi-gestructureerde interviews ontdekte ik drie manieren die in alle landen werden gebruikt voor het verminderen van het aantal ziekenhuisinfecties: 1) het gebruik van beelden in het geven van feedback aan zorgprofessionals 2) verspreiding van verschillende soorten kennis en zorgen dat deze kennis betekenis krijgt voor deze specifieke situatie en 3) het stimuleren van leren van elkaar (tussen verschillende organisatieniveaus, afdelingen en disciplines). Ondanks deze overeenkomsten tussen de verschillende landen concludeer ik ook dat het leren tussen landen ingewikkeld is. In ieder land is een andere manier om kwaliteit te verbeteren dominant en als je van elkaar wil leren wil stimuleren moet je rekening houden met gezondheidszorgsysteem.

Met dit proefschrift wil ik bijdragen aan het verbeteren van zowel de wetenschap als de praktijk door kennis te verspreiden over de dingen die bijdragen of verhinderen dat zorgprofessionals zich ontwikkelen om kwaliteit verbeteractiviteiten uit te voeren. De drie casussen zorgden voor meer inzicht in de dynamiek die samenhangt met de manier waarop we in Nederland omgaan met kwaliteitsverbetering in ziekenhuizen. In de combinatie van adviseur en onderzoeker in alle casussen had ik meer toegang tot betekenisvolle en zinvolle data dan ik ooit als alleen onderzoeker had kunnen krijgen. Door gebruik te maken van actie onderzoek kreeg ik beter inzicht in wat er daadwerkelijk gebeurde, in tegenstelling tot wat mensen zeggen dat zij doen (zoals in interviews gebeurt). Zorgprofessionals en adviseurs bleken gemakkelijk te betrekken bij mijn onderzoek en zij waren vaak super gemotiveerd om mij te ondersteunen in het op valide en betrouwbare wijze verzamelen van data. Vaak gaven zij mij direct feedback op mijn bevindingen of hielpen zij mij, met hun vragen, om nog beter naar mijn data te kijken om te begrijpen wat het probleem was of het 'werkzame' bestandsdeel in deze situatie. Daarnaast waren zij ook vaak bereid om mijn ideeën over hoe het beter kon (op basis van de data analyses) uit te proberen en gezamenlijk te ontdekken wat de effecten daarvan waren.

Samenvattend, ik leerde dat we in Nederland verbeteractiviteiten vaak onderbrengen in projecten. De huidige aanname is dat als we zorgprofessionals leren om kwaliteit verbeteractiviteiten uit te voeren, de werkgroepleden de context (structuren, culturen, medewerkers) kunnen veranderen, terwijl zij werken aan het verbeterdoel. Helaas laat dit onderzoek zien dat de huidige manier waarop we zorgprofessionals 'onderwijzen' niet goed aansluit bij hun leerstijl voorkeur en de vaardigheden die we aanleren ook niet alle onderwerpen dekken die zij belangrijk vinden. Met name projectmanagement en veranderkundige vaardigheden moeten meer aandacht krijgen blijkt uit dit onderzoek. Daarnaast leerde ik dat vanuit sociaal perspectief de voorwaarden voor lerende organisatie nog niet voldoende ontwikkeld zijn. Bovendien concludeer ik dat de manier waarop

we verbeterprojecten organiseren vooral **eerste orde leren** ondersteunt: het oplossen van het probleem of perfectioneren wat er al is. Eerste orde leren is soms genoeg, omdat het probleem voldoende duidelijk is en de oplossing voor de hand ligt. Zoals het verbeteren van de handhygiëne om ziekenhuisinfecties te verminderen. Wanneer hiervan sprake is, is het niet nodig om een verbeterproject te starten. Mijn onderzoek laat zien dat dan andere methoden ook kunnen werken, zoals het tonen van boodschappen op een screensaver. Helaas zijn de meeste kwaliteitsdoelen niet zo makkelijk te realiseren, omdat de context waarin het probleem zich voordoet complex is en het probleem niet zo makkelijk te doorgronden. Voor deze doelen is **tweede of derde orde leren** nodig. Tweede en derde orde leren draait om het onderzoeken van de dominante veronderstellingen en meningen (mentale modellen of denk kaders) over jezelf, de taak, de situatie en andere betrokkenen. Door jouw denk kaders op te rekken worden andere observaties gedaan, waarnemingen anders geïnterpreteerd, problemen anders gedefinieerd en daardoor verandert ook de wijze waarop mensen zich gedragen.

Als adviseur, coach van werkgroepen en teams of als lid van het programma team leerde ik hoe ik het leren kon stimuleren. Ik kreeg meer gevoel voor de manier waarop verbeterdoelen bereikt kunnen worden, maar ook hoe ik vaardigheden – en in het bijzonder projectmanagement en veranderkundige vaardigheden – kan overdragen. Door omgevingen te creëren waarin de Ontdekkende en Participerende leerstijl floreren, gingen zorgprofessionals en adviseurs met elkaar in gesprek over hun aannames/denkkaders en hun beelden over opgedane ervaringen.

Ook leerde ik dat het belangrijk is dat zorgprofessionals leren om (extern gedreven) verbeterdoelen te verenigen, de verschillende organisatie niveaus te verbinden en een gezamenlijke visie of ambitie voor de toekomst te formuleren. Daarnaast leerde ik het belang van het gezamenlijk uittesten met behulp van experimenten van verschillende wegen en manieren om de gewenste verbeteringen te bereiken. Dit experimenteren zorgt voor een organisatie ontwikkelingsproces gebaseerd op voortdurend initiëren van incrementele verbeteringen. Daarnaast leerde ik tijdens dit onderzoek ook veel over hoe ik in de rol van adviseur goed onderzoek kan doen. In een wederkerig proces tussen wetenschap en praktijk had ik als onderzoeker te maken met bepaalde spanningen. Ben je vooral loyaal aan de wetenschap en zorg je voor mooie data of wil je de praktijk vooral verder helpen? Ik vond vier manieren om met die spanning om te gaan. Als eerste, in gesprekken met zorgprofessionals probeerde ik zoveel mogelijk hun woorden, beelden en metaforen te gebruiken. Daarmee bleef ik dicht bij mijn data en deed niet allerlei toevoegingen. Als adviseur is dit ook behulpzaam, omdat je aansluit op hun belevingswereld, ervaringen en gevoelens. Als tweede om mijn bevindingen als onderzoeker vooral te presenteren als mogelijke

manieren om te kijken naar de problemen, mogelijkheden om te verbeteren of context. Als wetenschapper geeft dit vaak de mooiste discussies over de data (member checking) en zie je snel waar nog een extra analyse slag nodig is. Als adviseur helpt mij dit ook, omdat suggesties van manieren van kijken anders voelen als advies bij zorgprofessionals. Ik merkte dat minder defensieve reacties krijg waarin medewerkers zich verdedigen of mij probeerden te overtuigen van hun gelijk. Als derde het gebruik van humor en door mijzelf nadrukkelijk als onderdeel van hun team te positioneren kon ik makkelijker mijn bevindingen delen. Door duidelijk aan te geven dat het ons probleem is en de draak te steken met 'onze' manier, was het makkelijker om medewerkers inzicht te geven in de data. Als vierde door vooral waardierend te benoemen wat al heel goed gaat. Als adviseur kan ik dan versterken wat al aanwezig is. De negativiteit die soms samengaat met verbeteractiviteiten worden daarmee gecompenseerd. Ook als wetenschapper helpt het om te kijken naar wat als vanzelfsprekend goed gaat.

## Noten

<sup>1</sup> Voor de leesbaarheid wordt hier 'ik' gebruikt, maar eigenlijk moet er 'wij' staan, want ik heb nooit alleen gewerkt aan dit onderzoek. De 'wij' omvat de bij dit onderzoek betrokken zorgprofessionals en managers en vooral ook mijn wetenschappelijke collegae met wie ik discussieerde over de onderzoeksdata.



# **Acknowledgement**

## **Acknowledgement**

Pursuing a PhD is a privilege for which I am grateful. The process of finishing a PhD, besides being a mom, wife, sister, informal care giver, friend, teacher, colleague, employer, and adviser was sometimes challenging.

Like most worthwhile things in life, completing this thesis - and especially several articles – would have been impossible without the help and involvement of many people. I know I will not be able to mention every single one of you. Therefore, from this page I would like to say: Thank you all for touching my life. Thank you for contributing to my (professional) development in recent years, both in and outside academia and business.

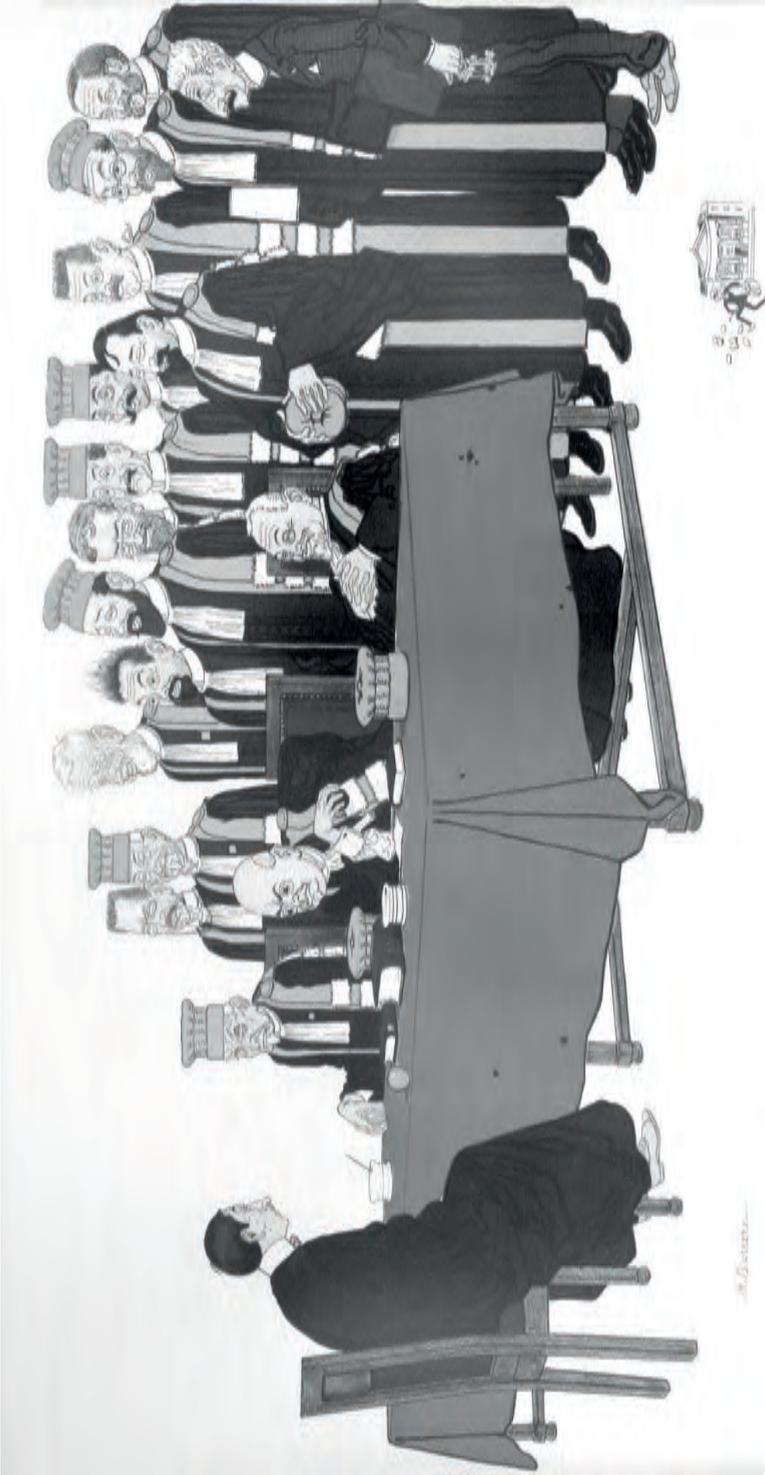
Thank you for all the support I received from your friendly questions, encouraging postcards and emails, cups of tea and fresh orange juice, dinners to relax, discussions about findings, co-reading, and so on. Some of you may recognize our connection and your contribution to this thesis by the pictures on the next pages. I put them there especially for you!

According to Arianna Huffington success is based upon a balance between well-being, wisdom, wonder and generosity. I am privileged to have people surrounding me who support me in all four of these dimensions, especially my family. This dissertation marks the close of another successful chapter in my life. I look forward to the beginning of a new one based on well-being, wisdom, wonder and generosity.

Anne Marie, 2015



Craft made by Elske



Adrien Barrère, Professeurs a la Faculte de Droit, 1874-1931

Acknowledgement



Mothers day Gift, 2010



Rooster Rings van Anthony Howe,  
DeCordova Museum in Lincoln Mass



Black and White fire by Pillemaster

**Bio**

## About the author



Anne Marie Weggelaar-Jansen was born July 5, 1969 in Amersfoort, the Netherlands. She is married to Dennis Weggelaar and has three children: Bas (1996), Sven (1999), and Elske (2001).

She was a registered nurse (MBO-V and part-time HBO-V). From 1991 to 1993, she studied Care and Policy Sociology part-time at the Faculty of Social and Behavioural Sciences of the University of Amsterdam. This programme teaches policy making for welfare-state funded organizations. She studied Advanced Change Methodology at Sioo, an inter-university centre for organization studies, change management, innovation and learning, obtaining a Master's degree in Change Management (MCM) in 2005.

Anne Marie started her working life in healthcare as a weekend nutrition assistant on an oncology and HIV ward. There she learned that quality of care is all about the small things that patients do not expect, and on providing care based on the latest evidence available.

After finishing her nursing training, she worked on pretty much every ward of a hospital. She had the privilege to be on a team that developed one of the first geriatric wards in hospitals and experienced the fun of aiming for better care. In 1994, after finishing her Master's in Sociology, she worked at the CBO, the Dutch institute of healthcare improvement. For several years she worked as project leader of quality improvement projects. In this position, she became 'infected' with the quality improvement virus, which has shaped her career tremendously. Next, she worked in various positions in several hospitals and for the Dutch Paediatric Association. Her job always concerned the development of quality improvement policy, teaching improvement tools and using improvements methods to improve care.

Since 2004, Anne Marie has a consulting practice and she has collaborated with over 50 organizations on change and innovation challenges. She has a special interest in assignments on organizational development, improvement of daily practice and developing innovative methods and tools (such as e-health). In addition, she coaches top managers and organizes management development courses.

In 2007 Anne Marie was appointed as a part-time researcher at the Institute of Health Policy and Management at Erasmus University. She participated in the Faster Better quality collaborative, advising three hospitals including two peripheral and one academic hospital. Following this, Anne Marie was an active researcher in a programme aimed at implementing care pathways in an academic hospital. Next, Anne Marie was a member of the Dutch QUASER team. In the QUASER research quality improvement work in hospitals was studied; the study was funded by the European Union. Recently she studied quality governance in Dutch academic and teaching hospitals commissioned by the Dutch Quality Institute on behalf of the NFU Quality Consortium. Alongside her research, she also teaches several courses (change and innovation, health service operation management, personal effectiveness, quality and safety management) and supervises Master's and Bachelor's theses.

