Collaboration Routines
A Study of Interdisciplinary Healthcare

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Abstract
This thesis deals with routines for collaboration among specialists from different domains in healthcare. Healthcare policy is increasingly directed at transforming clinical healthcare into an interdisciplinary organization where diverse medical specialists collaborate in delivering complete treatments to the patient. However, as both practice and research repeatedly reports, achieving interdisciplinary collaboration is difficult. Due to the divides in knowledge and practice which exist between the medical disciplines, multidisciplinary clinics do not automatically lead to collaboration involving integration of disciplinary knowledge. Based on recent conceptualizations of organizational routines as sources of both stability and flexibility, this thesis concentrates on the type of routines that enable collaboration across domain boundaries. Collaboration routines, as they are called here, are suggested to support the interdisciplinary clinic in making use of its diversity in knowledge and practice. The thesis is comprised of four papers, including three empirical case studies of clinical healthcare. The combined findings indicate that collaboration routines support idea generation, testing of new joint practices and trial-and-error learning. Contrary to the common underlying conception of routines as blueprints, these findings bring to the surface an underlying logic of shared learning. Collaboration routines continuously support the formation and maintenance of shared cognition and shared motivation among different domain specialists, thereby assuming a function of continuous routinizing. The thesis contributes to the literature on routines by advancing research on how routines can support collaboration across domain boundaries within an organization.

Keywords: organizational routines, interdisciplinary collaboration, knowledge integration, healthcare organization.

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COLLABORATION ROUTINES

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A Study of Interdisciplinary Healthcare

Peter Markowski
For Jenny
List of appended papers

Paper A

Paper B

Paper C

Paper D
Abstract

This thesis deals with routines for collaboration among specialists from different domains in healthcare. Healthcare policy is increasingly directed at transforming clinical healthcare into an interdisciplinary organization where diverse medical specialists collaborate in delivering complete treatments to the patient. However, as both practice and research repeatedly reports, achieving interdisciplinary collaboration is difficult. Due to the divides in knowledge and practice which exist between the medical disciplines, multidisciplinary clinics do not automatically lead to collaboration involving integration of disciplinary knowledge. Based on recent conceptualizations of organizational routines as sources of both stability and flexibility, this thesis concentrates on the type of routines that enable collaboration across domain boundaries. Collaboration routines, as they are called here, are suggested to support the interdisciplinary clinic in making use of its diversity in knowledge and practice. The thesis is comprised of four papers, including three empirical case studies of clinical healthcare. The combined findings indicate that collaboration routines support idea generation, testing of new joint practices and trial-and-error learning. Contrary to the common underlying conception of routines as blueprints, these findings bring to the surface an underlying logic of shared learning. Collaboration routines continuously support the formation and maintenance of shared cognition and shared motivation among different domain specialists, thereby assuming a function of continuous routinizing. The thesis contributes to the literature on routines by advancing research on how routines can support collaboration across domain boundaries within an organization.

Key words: organizational routines, interdisciplinary collaboration, knowledge integration, healthcare organization
Samarbetsrutiner – en studie av interdisciplinär sjukvård


Denna avhandling utforskar rutiner för samarbete över specialistgränsar, för att bättre förstå hur kliniska rutiner kan stödja interdisciplinärt samarbete. Med hjälp av data från tre fallstudier undersöker denna avhandling de svårigheter som uppstår vid försök till organisering av interdisciplinärt samarbete, och belyser hur rutiner kan användas för att få till stånd samarbete trots dessa svårigheter. Avhandlingen har därmed sitt fokus ”på sjukhusgolvet”, i den interaktion, friktion och samskapande inom samarbetsrutiner som utgör grundbulten i de nya, interdisciplinära vårdprocesserna.

Medan varje fallstudie undersöker ett specifikt område visar en analys av de samlade resultaten på ett behov av att nyansera idén om rutiner när det gäller interdisciplinär samverkan. Samarbetsrutiner, som de kallas här, har som främsta uppgift att understödja gemensamt lärande över specialistgränsar. Detta kontrasterar med den vanliga synen på rutiner som planritningar som beskriver det som ska göras i detalj. Samarbetsrutiner behöver införas av ledningen med målet att stödja interdisciplinär samverkan, men de ska till stor del utformas av den sjukvårdspersonal som ska utföra samarbetet.

Dessa resultat indikerar behovet av en ny syn på processer i interdisciplinär sjukvård. Att organisera för lärande över specialistgränsar är ett långsiktigt åtagande och medför att rutiner kanske inte ger önskade resultat på kort sikt. Medicinska specialiteter är i sin kunskapsbas och praktik ”levande” och utvecklas ständigt. På samma sätt behöver en interdisciplinär organisation kontinuerligt se till att ny kunskap tas till vara och slussas in i den gemensamma
praktiken. Därmed kräver den interdisciplinära organisationen, med rutiner för samverkan över specialistgränser, en investering i form av ett kontinuerligt och långsiktigt engagemang från både ledning och vårdgivare.
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1 Introduction

1.1 Setting the scene: “A new organization can fix healthcare”

In November 2017, in the major Swedish daily Dagens Nyheter, the following opinion and story was published following the death of a cancer patient who was not treated in time:

The worst thing is that what happened [to the patient] did not have to happen. It can be fixed. It is not even very difficult. Let us call it the creation of a "multi-disciplinary flow". This problem is nothing but an organizational problem. [This can be fixed if the hospitals] organize their clinical work by creating a coherent team of, for example, receiving physicians, a team of different tumor specialists, an X-ray (MR or CT) resource, additional diagnostic and surgical resources. These teams could have a number of slots: visit day one, X-ray and other tests day two, team conference day three and surgery day four.

This excerpt from the largest newspaper in Sweden indicates at least three parallel stories. One, the quality and efficiency of the healthcare system is an issue that is at the centre of a welfare society. Two, how well healthcare delivery works is something that everybody, at some moment in time, will need to take into account. Three, healthcare delivery is largely an organizational issue, and an interdisciplinary organization, once established, can in a better way provide healthcare services to everyone in need. The latter issue is at the core of this thesis.

1.2 Organizing medical specialists

The organizational issue in healthcare has attracted much attention, and initiatives for transforming the way delivery is organized are at the heart of contemporary models for healthcare delivery. There is a generally supported idea that it is time to abandon the “old way” of organizing healthcare. Rather than seeing medical disciplines as the building blocks by which healthcare is organized, the “new way” brings the patient to the forefront. Two basic changes to the way healthcare is delivered are central to the models of the new healthcare organization. The first change is to bring down the silos of medical disciplines
and instead organize care delivery by gathering appropriate specialties around
the patient (Porter and Lee, 2013). There is general consensus that collabora-
tion among clinical specialists from different domains (i.e. interdisciplinary
 collaboration), in the treatment of each patient, is the essential way forward.
Interdisciplinary collaboration means more than just working side by side. By
using shared problem-solving processes, new knowledge can emerge that
combines knowledge from all specialists involved (Mitchell et al., 2009).

Secondly, the specialists should collaborate within designated flows, or pro-
cesses, which involve all the necessary steps in delivering a certain treatment.
The “flow” suggests that it is a process approach rather than a discipline ap-
proach that should be the preferred way of organizing. Furthermore, the
boundaries of disciplines should be questioned, or at least perforated, by in-
viting several specialties to join teams that, consequently, become ‘inter-dis-
ciplinary’ (Petri, 2010). The argument is that an organization that supports
interdisciplinary collaboration and learning among medical specialists has the
potential to provide better care for the patient. Having accepted this argument,
the next question is how to organize for this.

1.3 Research problem and aim of the thesis

The discourse in healthcare management is to a significant extent (see Paper
A) focused on collaboration between different medical specialists in deliver-
ing care to the patient. Petri (2010) finds in a concept analysis that interdisci-
plinary collaboration in healthcare can be described as “an interpersonal pro-
cess characterized by healthcare professionals from multiple disciplines with
shared objectives, decision-making, responsibility, and power working to-
gether to solve patient care problems” (p.80).

To denote collaboration between specialists from different medical domains,
the word “interdisciplinary” is commonly used in the healthcare management
literature (even though medical specialists could be argued to belong to the
same discipline, namely, physiology). Actually, for the purpose of this thesis,
the word “domain” provides a more accurate way to distinguish the area of
specialization than the word “discipline”. This is due to the nature of special-
ization studied here. The specialization in question can be within one of the
medical areas, such as surgery or oncology, but it can also be an orientation
towards a specific kind of work, such as medical research or clinical practice.
The crucial feature here is that specialization affects the way a specialist understands and justifies his/her work (Brown and Duguid, 1991, Boland Jr and Tenkasi, 1995), which has consequences for organizing collaboration. Nevertheless, to conform to the praxis of the healthcare management literature, the word “interdisciplinary” is also used in this thesis. The words “discipline” and “domain”, as well as the expressions “between domains” and “interdisciplinary”, are hereafter used interchangeably.

Findings from numerous studies show that organizing collaboration among healthcare specialists is difficult (Hall, 2005, Nembhard and Edmondson, 2006, Tucker et al., 2007). Edmondson et al. (2001) study the development of a new surgery routine as a result of new technology implementation. They show that even though the team members developing the new routine are well acquainted with each other, new routine developments require a substantial effort. Other studies show that additional difficulties arise when specialists come from different domains (Nugus et al., 2010, Salas and Rosen, 2013, Sims et al., 2015, Liberati et al., 2016) because the collective effort is hindered by a lack of understanding of the other domains.

Thus, one should not assume (as in the newspaper story above) that if specialists from different domains are gathered in the same clinic, the clinic automatically achieves interdisciplinary collaboration. While the diversity in knowledge and practices is the main asset in such an organization, it is also the main problem. The question is how to organize collaboration across domains in a dynamic, knowledge-intense environment, where specialists with different orientations need to find common ground. To investigate how such dynamics are supported in everyday practices, this thesis specifically deals with organizational routines¹ for interdisciplinary collaboration. Routines, which define recurring practices, are the backbone of clinical work. By focusing on routines for collaboration, the thesis thus puts emphasis on the way in which healthcare organizations go about organizing daily interdisciplinary work.

In common parlance, routines make sure that work is performed in an appropriate way in order to reach the desired results. In theoretical terms, the routine can be defined as “a repetitive, recognizable pattern of interdependent actions, carried out by multiple actors” (Feldman and Pentland, 2003, p. 96). Routines are sometimes said to embody what the organization does and make things

¹ “Organizational routines” and “routines” are here used interchangeably.
natural, or stable, in everyday work. The stability of routines has received the greatest attention in the literature in early work on routines (Stene, 1940, Simon, 1947, March and Simon, 1958, Cyert and March, 1963, Dosi et al., 2000a). This work highlighted their properties as standard operating procedures, implying that sequences of tasks are performed repeatedly, even “mindlessly”, without reflection. No doubt, there are many such routines, for example billing routines, where standardized tasks are used to reach a predetermined end result.

Yet, looking more closely at work in organizations, scholars have observed that many routines do not fit the above description. Empirically studying a hiring routine, Feldman (2000) observed that it did in fact change as a result of individuals adapting the routine to small changes in their environment as it was being carried out. This led scholars to start conceptualizing routines as flexible, which could explain how organizations handle variabilities in the environment. The dynamic view on routines conceptualizes them as sources of continuous change, thus as dynamic and flexible, fuelled by the actions of individuals carrying out the routine (Pentland and Rueter, 1994, Feldman and Rafaeli, 2002, Feldman and Pentland, 2003, Miller et al., 2014, Feldman et al., 2016). Building on this view, recent studies of organizations in dynamic (i.e. characterized by change) environments have even suggested that routines can serve as temporary enabling structures. Edmondson and Zuzul (2016) studied innovation projects and found that routines played a central role in connecting actors in order to enable “teaming”, that is coming together in a temporary constellation for a given purpose. The above studies have brought individuals into the theory of routines, highlighting that people need to interact and connect in order to make use of their knowledge collectively.

While a view on routines as flexible structures is emerging, there is still limited insight into how routines can enable the dynamics involved in collaboration between diverse actors. This is problematic in healthcare, where clinical routines, although employed to bring together specialists, often do not lead to the desired interdisciplinary collaboration where specialists engage across domains (Liberati et al., 2016; Liberati et al., 2015). As Feldman and Rafaeli (2002) assert, successful routines achieve connections among people, who form shared understandings of what needs to be done in the routine and what the overarching goal is. Management intensions, such as working in an interdisciplinary way, may need to be modified and translated into actual routines through interactions on the hospital floor (Rerup and Feldman, 2011). Taking
this perspective on routines in the context of interdisciplinary collaboration brings attention to the centrality of successfully forming shared understandings in daily clinical work among specialists from different disciplines.

Specialists from different domains, however, tend to have different cognitive structures (Baer et al., 2013), which means that shared understandings are not easily achieved. This has specifically been observed in healthcare (Evans and Baker, 2012), which involves highly specialized experts, each with extensive training within a narrow domain. Furthermore, healthcare has high knowledge-intensity and a focus on task efficiency, dictating that problems be solved as they arise. This hinders shared learning because individuals are motivated to focus on their own tasks rather than try to form shared working practices (Tucker and Edmondson, 2003). Such tendencies of isolation maintain differences in mental models and thus obstruct interdisciplinary collaboration (Körner et al., 2016; Mitchell et al., 2017). Scholars have begun investigating how routines connect actors (Feldman and Rafaeli, 2002; Edmondson and Zuzul, 2016; Feldman and Rerup, 2011), but the question of how cognitive and motivational differences between experts can be overcome using routines is still largely open in the literature.

The aim of this thesis is to contribute to the theory of routines by empirically studying how routines can support interdisciplinary collaboration in clinical healthcare. The thesis concentrates on routines that enable collaboration across domain boundaries, here called collaboration routines. The concept of a collaboration routine applies to organizational contexts characterized by high knowledge intensity that require collaboration between experts from diverse domains. Healthcare is a case in point. Here, routines need to support collaborative work which involves joint problem solving among highly specialized experts from different domains (Weinberg et al., 2011).

The thesis evolves around four papers, of which three report on empirical case studies of clinical healthcare, each analysing a certain aspect of collaboration between specialists from different domains. The case studies concentrate on interactions on “the hospital floor”, focusing on unpacking routines for interdisciplinary collaboration to identify the mechanisms at work. Focus is placed on interactions among clinical specialists to uncover frictions and enabling factors in routines for collaboration across domains. While each paper has its own specific aim, this cover paper uses selected parts of the studies to form an aggregated analysis of how collaboration routines enable interdisciplinary
collaboration. This thesis contributes to the literature on routines by empirically investigating how routines can support collaboration across domains.

1.4 Structure of the thesis

To investigate the formation and functioning of routines for interdisciplinary collaboration in healthcare, this thesis draws on the findings from four papers. This cover paper is based on a rereading of the papers from this specific vantage point. Thus, each paper has its own specific inquiry, addressing a question different from the aim of this cover paper. The papers are here interpreted together in an attempt to perform an analysis on a higher level. Paper A presents a critical literature review of interdisciplinary collaboration in healthcare, taking stock of the current discourse and identifying areas in need of further inquiry. Paper B develops a theoretical framework which is applied to a comparative case study, thereby identifying specific characteristics of routines for interdisciplinary collaboration. Paper C investigates how daily working routines in a clinic can be adjusted to accommodate interdisciplinary collaboration. Paper D analyses the formation of routines across medical domains.

The rest of the cover paper is structured as follows. The next section presents a conceptual overview. It discusses some of the central concepts of relevance to this thesis and positions them with regard to the literature. In the ensuing section, the methods used in this research are presented. This section contains a reflection on the research process and the choices that were made. It is followed by a summary of the four papers, which make up the body of this thesis, followed by a high-level analysis of the findings from the specific vantage point here chosen. In the ensuing section are the implications for theory and policy. Finally, limitations and avenues for future research are suggested.
2 Collaboration and routines

2.1 Routines – a short history and basic characteristics

In very general terms, a routine is the way things are done in an organization. Throughout the history of the concept, scholars have used different analogies to conceptualize organizational routines. Early conceptions compared routines to habits and saw them as automatic (cf. Stene, 1940). Cyert and March in *A behavioral theory of the firm* (1963) employed routines (denoted standard operating procedures) to describe structured ways of organizing work, likening them to programmes, or scripts. Nelson and Winter (1982) strongly contributed to the development of the routine concept in their work on evolutionary economics. They stated that the behaviour of firms can be explained by the routines that they employ, likening the routines to genes which together make up the firm’s DNA.

Although the literature on routines has grown a lot since the work by Nelson and Winter (1982), there is still no consensus on how they should be described, and different definitions exist in the literature. Notably, while early conceptions emphasize the stability of routines, more recent work highlights their flexibility (Pentland and Feldman, 2005). Feldman and Pentland (2003, p. 95) defined the routine as a “repetitive, recognizable pattern of interdependent actions carried out by multiple actors”. This definition is adopted in this cover paper.

Despite definitional differences, the notion of routines as the basis for what an organization can accomplish has become a cornerstone in several strands of organization theory, such as organizational capabilities theory (Teece and Pisano, 1994, Teece et al., 1997, Dosi et al., 2000a, Dosi et al., 2008, Winter, 2012) and organizational learning theory (Levitt and March, 1988, Levinthal and March, 1993, Argote, 2013).

Routines have been argued to serve as a means of coordination (Nelson and Winter, 1982). The coordinative effect comes from the possibility of supporting simultaneous activity, or in general - structuring interactions (Grant,

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2 Papers B and D employ definitions that are worded differently, depending on the focus of the paper, but still are consistent with the definition employed here.
1996). For example, in healthcare, routines are used to make sure that appropriate parts of care are provided at the right time, which is crucial for successful treatment. It has been suggested that the emergence of the coordinative effect requires shared understanding among individuals (Okhuysen and Bechky, 2009), allowing them to build relations to each other (Gittell and Douglass, 2012).

Routines have also been argued to allow the organization to economize on cognitive resources in terms of decisions and information processing. Since routines store experience of what works, cognitive resources can be focused on finding solutions to newly surfaced problems. Furthermore, routines help reduce uncertainty. This is mainly due to the increase of predictability, (which in addition contributes to freeing cognitive resources). Routines have also been argued to have a governing effect (Coriat and Dosi, 1995), based on the argument by Nelson and Winter (1982) that routines can be regarded as a “truce”. This explains how routines can function despite the differences in interests, which exist in an organization. Simply put, if there are routines, people in the organization are busy doing what they have to do and give up their own agenda. This kind of reasoning is the cause of routines having been associated with stability and rigidity (Leonard-Barton, 1995, Hannan and Freeman, 1984), and even competency traps (March, 1991).

While the repetitive nature of routines has led to scholars describing them as patterns, different suggestions have been put forward with regard to what these patterns contain. Each perspective provides an insight into what the routine entails. Routines have been studied as rules (e.g. standard operating procedures, see Cyert and March, 1963) and as activity patterns (meaning recurrent interaction patterns, cf. Becker, 2005; Becker and Zirpoli, 2008) and they have also been argued to be dispositions (Hodgson, 2009). Rules are regularities on the cognitive level and they guide individuals on what to do in a given situation. Activity patterns define the interactions of individuals in the routine, when it is performed. The idea behind routines as dispositions is that they exist regardless of whether they are used or not (e.g. they don’t disappear when the office closes).

Another dimension of routines which divides the literature is whether routines are automatic or “effortful accomplishments” (Pentland and Reuter, 1994, p. 488). Scholars proposing the first view see routines as carried out without much effort, or without even paying attention to them (Stene, 1940, Gersick and Hackman, 1990, Cohen, 1991, Dosi et al., 2000b). Essentially, this view
pursues the argument of routines as ways of saving cognitive resources. The second view suggests that routines are carried out with awareness and effort (Pentland and Rueter, 1994, Orlikowski, 2002, Rerup and Feldman, 2011, Pentland et al., 2012) and thus implies that routines can allow variation in terms of how tasks are carried out. As Becker (2004) points out, studies assuming the first perspective are almost all conceptual, while studies with the latter view are generally empirical. It thus seems that while the idea of “mindless” stability provides a useful theoretical conceptualization, it is not easy to reconcile with the routines observed in the real world (Feldman, 2000).

Many empirical studies describe organizational routines as collective phenomena (Gersick and Hackman, 1990, Grant, 1991, Cohen and Bacdayan, 1994, Cohen et al., 1996). As Weick (1990) concludes, routines can break down when individuals stop acting as part of a collective. Studying the Tenerife airplane disaster, he observes that highly trained experts failed to handle a difficult situation that seemingly could have been handled using existing routines, because they stopped using routines due to stress. Analogous observations have been made in healthcare, where team training and feedback in combination with routines coordinating the tasks of individual specialists have been found to reduce mistakes in perinatal care (Riley et al., 2016). Consequently, the theory of routines points to a conflict in that the individuals involved in a routine need to make their own decisions depending on the context, yet at the same time need to act as part of the collective. Separate tasks can be altered depending on the situation, but changes to individual tasks need be coordinated and integrated as part of collective output.

2.2 The flexibility of routines

Early work on routines has highlighted their rigidity, and even their tendency to hinder the organization from making progress. In this vein, routines have been seen as leading to inertia (Hannan and Freeman, 1984) and even becoming competency traps (March, 1991), which stop the organization from exploring new possibilities. However, scholars have suggested that organizations can change and adapt by changing their routines. Levitt and March (1988) suggested early on that routines change as a result of changes in the external environment. Stimuli can also originate inside the organization, for example, when formulating new goals (Cohen et al., 1996) or introducing new technology (Von Hippel, 1994). Since routines encode what the organization can do, changing them implies changes in the capability of the organization.
Routines have in this way been highlighted as key to organizational learning (Levinthal and March, 1993, Argote, 2013). Since they store experience, routines have also been likened to memory (Nelson and Winter, 1982).

Routines have in the literature largely been categorized into two levels: either as part of production, aimed at performing everyday working tasks that are core to the organization, or as an auxiliary function, typically aimed at gathering organizational members to handle issues outside of everyday production routines. Such routines could, for example, as Adler et al. (1999) found, be aimed at the improvement of production routines. Scholars have commonly used the term “search routine” or “higher-order routine”, to denote those routines which are not part of regular production (Collis, 1994, Zollo and Winter, 2002).

Scholars have more recently suggested that routines in themselves involve dynamics. They have highlighted that routines can change (Feldman and Pentland, 2003) and that they are flexible (Pentland and Feldman, 2005). As observed by Feldman (2000), this can be the result of individuals changing the way they carry out the routines. Thus, routines have been suggested to be flexible sources of continuous change, driven by the actions of individuals. An endogenous driver of change in routines comes from the actor’s ability to learn and change behaviour. For example, Pentland and Reuter (1994) liken routines to “grammars of action”, alluding to the possibility of forming routines to fit the situation at hand. Furthermore, as Rerup and Feldman (2011) assert, routines can have a dual role, both as the product of shared perspectives and as a means to engage the organization in learning.

It thus seems that routine flexibility could be understood as a combination of (emergent) incremental individual action and making deliberate changes to routines in response to change in the larger organization or environment. In both cases this seems to be the product of mindful effort, where organizational members attempt to find appropriate ways of handling the current situation, be it internal to the organization or part of environmental changes. Since routines are collective phenomena, such change and adaptation of routines involves efforts by several actors. As Feldman (2000) found, the hiring routine she studied was changed when a group of people came together to discuss previous iterations of the routine and form a shared understanding of how hiring should be carried out.
The interdependence between actions in routines means that forming and changing routines will require people to communicate and coordinate among themselves. This joint learning process has been found to require substantial collective effort. Edmondson et al. (2001) studied the implementation of new technology in a team surgery routine across 16 hospitals. They found that successful teams, focused on implementing the new technology, underwent certain stages in the implementation process, including enrolment, preparation, trials and reflection.

Routines have also been found to support temporary teaming among specialists. Edmondson and Zuzul (2016) studied an innovation project, which required teaming between specialists from several different organizations, and found that leaders used routines for communication and experimentation to bring together specialists in the project. In this way, routines are both the source and the product of change (Rerup and Feldman, 2011).

2.3 Routines for interdisciplinary collaboration in healthcare

Healthcare has high knowledge-intensity and treatments requiring many different specialists. Here groups of medical specialists, who have different knowledge and mental models of care (Körner et al., 2016), need to collaborate in routines to deliver care together throughout the patient’s treatment, which is referred to as a care pathway (van Hoeve et al., 2014). A typical part of a care pathway in a clinic delivering care to breast cancer patients may look as follows:

Discussion at the multidisciplinary team (MDT) meeting – the whole team meets to discuss patients who may have serious problems. Decision on the type of treatment needed. Pre-operative assessment (in cases when surgery is needed) by pre-assessment nurses and the breast care nurse. Surgery involving surgeon, anaesthetist and theatre nurses. A re-discussion at MDT meeting, to assess the result of the surgery and decide on further treatment. Continued treatment (e.g. chemotherapy)...

If broken down into parts, the integrated care pathway exemplified above contains several routines of different types and with different aims. These routines contain the collaborative interactions among specialists. The MDT meeting is a gathering of different specialists in order to decide collectively, based on the
combined input of each specialist, how to proceed in treating the patient. During surgery, medical specialists operate directly on the patient. At the re-discussion, medical specialists together assess results. These are all different examples of routines for interdisciplinary collaboration. The first has the purpose of deciding on treatment, the second has the purpose of delivering treatment and the third has the purpose of evaluating treatment methods. The care pathway may be thought of as consisting of bundles of routines which together serve to deliver care to the patient. In this way, routines in healthcare are interconnected, surrounded by and entangled with other routines (Howard-Grenville et al., 2016).

Scholars argue that interdisciplinary collaboration in healthcare is made difficult due to a combination of conflicting characteristics. The nature of medical treatment can often be fast-paced and complex, thus requiring an organization of high reliability (Baker et al., 2006), where specialists work together like a well-oiled machine. At the same time, medical knowledge and expertise are strictly differentiated into domains, which act as “invisible walls”, effectively obstructing collaborative work (Liberati et al., 2016). Consequently, and as repeatedly reported in the healthcare management literature (see Paper A), collaboration across medical domains requires substantial effort in order to actively bridge these boundaries.

As (Mitchell et al., 2009) suggest, interdisciplinary collaboration in healthcare essentially requires specialists to “drop their tools” and open up to the views and practices of other disciplines, allowing their current knowledge and views to be challenged and adapted. Whereas this can be more or less difficult in each specific case, the essential problem is how to effectively enable it throughout an entire organization (e.g. in an interdisciplinary clinic). As described in the newspaper clip in the introduction, the idea of interdisciplinary care involves making it the basic principle governing how treatment is delivered, which implies that it should be enacted in the routines of the clinic. A central area of inquiry in the healthcare management literature is how to organize in order to make use of the diversity in specialization yet at the same time foster the cohesion required for collaboration among specialties.

There is a central distinction between the knowledge of how to give treatment in collaboration within the clinic and the domain knowledge held by each specialist (see Figure 1). The routines here constitute the organizational “know-how” required to collectively deliver treatment, for example, to patients with
breast cancer. This “know-how”, embodied in the routines, is context-dependent, developed among the specific specialists collaborating in a specific organization. Independent of the routine is the domain knowledge of each specialist, who knows what to do, and how to do it, when providing treatment within his/her own area of expertise. This domain knowledge is based on medical training and experience and is largely independent of the organization in which the work is carried out.

Figure 1. Domain knowledge & organizational knowledge in healthcare

2.4 Routines and domains

Because individuals from different domains hold different knowledge and perspectives, they often employ different routines or understand and use the same routines in different ways (Howard-Grenville, 2005). The routines of each domain are based on the common understanding (within the domain) of what the work implies as well as on the shared knowledge of how to perform the work. Medical domains are strongly held together, as communities, which continually develop internal knowledge and practice. This directs members of each domain towards developing the domain-specific knowledge and practice, and it creates boundaries between the different specialized domains (Bechky, 2003, Carlile, 2002). Such domain boundaries hinder knowledge integration (Howard-Grenville and Carlile, 2006) required for collaboration. As Postrel
(2016) highlights, an essential problem is the inability to understand how specialists from another domain do their work. This has been observed to hinder collaboration in healthcare, where specialists from different domains have different language and mental models of care (Evans and Baker, 2012, McComb and Simpson, 2014). This cognitive diversity can lead to difficulties in reaching shared understanding, due to what Baer et al. (2013) call “representational gaps”, when specialists from different domains use the same terminology for different things. It can also cause an unwillingness to open up and adapt the own practices to those of other specialists with different training.

These “domain worlds” are largely independent of any specific organization, such as a hospital or clinical institution. As Glouberman and Mintzberg (2001) highlight, doctors work in hospitals, not for them. In essence, these medical disciplines can be understood as knowing communities, defined by Cohendet and Llerena (2008) as “inter- or intra-organizational, often geographically dispersed, groups of people that have a long-term orientation on knowledge sharing or knowledge creating activities. The groups have their own identities and focus their knowledge processes around a certain practice, i.e. a professional discipline, skill or topic” (p. 261). For example, surgeons are united in applying and developing surgical knowledge, regardless of which institution they currently work in (and many work in several places). Surgeons have joint research programmes and both teach each other and learn from each other how to be good surgeons in accordance with their community guidelines.

Domains are “living organisms” in the sense that they continually evolve through the development of knowledge and practice. For example, new biomedical discoveries, new technology and new treatment methods continually come about as medical science and practice progresses. This involves interaction between research and clinical practice (Morlacchi and Nelson, 2011). This continuous development of the domain knowledge base makes it possible for medical specialists to treat and cure new diseases.

While domain specialization enriches the organization with a vibrant diversity in knowledge and practice, it also creates boundaries which require effort to cross in order to develop shared routines. Studies suggest that conscious effort is required to enable specialists from different domains to collaborate, because they are prone to focus on their own area instead of the organization as a whole (Hall, 2005, Mitchell et al., 2009). For specialists from different domains to be able to form joint routines, they need to engage in building connections to
foster shared knowledge and aims (Feldman and Rafaeli, 2002). In a study of interdisciplinary surgical teams, Edmondson (2003) found that learning new routines relied to a large extent on finding and communicating rationales for change that could be understood by all specialists involved. Similarly, it was important for specialists to be able to speak up in the interdisciplinary group. Bechky (2003) asserts that, for routines to be understood and used across domains, it is necessary to create common ground by bringing to the surface the domain-specific differences that exist.

Table 1 summarizes properties of routines and properties of knowledge domains. Routines can be understood to have integrative properties, to bring together individual specialists by engaging them in common work. In contrast, specialized domains have differentiating properties and essentially pull apart specialists by separating them from each other in terms of knowledge and practice.

*Table 1. Integrative properties of routines & differentiating properties of specialized domains*

<table>
<thead>
<tr>
<th>Integrative properties of routines</th>
<th>Differentiating properties of specialized domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Are collective (involve several persons)</td>
<td>• Specialized knowledge</td>
</tr>
<tr>
<td>• Connect actors in the organization</td>
<td>• Cognitive structure</td>
</tr>
<tr>
<td>• Are the “know-how” of the organization, carry tacit knowledge</td>
<td>• Language</td>
</tr>
<tr>
<td>• Enable knowledge integration between organizational members</td>
<td></td>
</tr>
</tbody>
</table>
3 Research approach and method

This section presents the research approach and method employed. First the research design is presented, followed by a presentation of how data collection was carried out, and lastly how data analysis was performed.

3.1 Research design

3.1.1 Objective

The research was designed with the aim of providing empirical detail in order to enrich and develop current theory on routines. I adopted a qualitative research design, appropriate for the study of routines for interdisciplinary collaboration (Eisenhardt, 1989). I wanted to get insight into routines on an operational level, which is where medical specialists engage in collaboration. Therefore I was interested in interviewing and observing medical personnel on the hospital floor, where “the rubber meets the road”, rather than just higher-level managers. I was also looking for cases that specifically involved starting or enhancing collaboration between specialists from different domains. Thereby I wanted to investigate routines on a level where key interactions would be visible, and where obstacles as well as ways of overcoming them would come to the surface. I wanted insight into the “crossing” of domains, where knowledge and practices from different medical domains met “face to face”, in order to investigate and analyse the integrative properties of routines.

The thesis has a theoretical focus, aimed at contributing to the literature on routines by studying routines for collaboration across domains. However, the empirical case of the organization of healthcare is a central public issue. As the newspaper clip above shows, understanding how to organize for interdisciplinary collaboration in healthcare is at the heart of the current societal discourse. Gaining empirically based insight into the dynamics of interdisciplinary collaboration as well as how to achieve it thus serves a more general purpose of practical value.
3.1.2 Designing the studies

Routines are context dependent (Becker, 2004), so in order to address the aim of contributing to the theory of routines by studying routines for interdisciplinary collaboration in healthcare, I chose a research design based on several empirical case studies that would yield both depth and breadth (Yin, 2009). I also used different methods, which to some extent complement each other. I performed one study based on a literature review, one based on a comparative case study, and two based on inductive single case studies. Using several different methods allowed me to achieve more encompassing findings with the depth and breadth required to shed light on routines for interdisciplinary collaboration in healthcare.

The study presented in Paper A is a literature review within healthcare management. It surveys studies performed by scholars directly connected to healthcare. This provided insight into what scholars of healthcare have found and where this discourse is heading. It allowed me to identify missing pieces to which I could direct my attention.

The study reported on in Paper B is a comparative empirical case study. It is largely based on a deductive approach (although as stated in the paper, this is to some extent combined with induction). The study develops a framework for analysis based on theory of routines and theory of knowledge integration. The study compares two different care contexts and points out their specific characteristics. One is within a medical domain, and the other encompasses several domains. This serves to shed light on key differences in the routines analysed.

The studies in Papers C and D are based on single case studies. They are inductive, starting from empirical detail to generate insights and develop theory. Empirical detail is scarce in studies of routines (Becker, 2004), which motivated this approach as a complement to the theoretical (literature review) and deductive approaches used in Paper A and Paper B respectively.

I am aware that in a general sense I have studied “success stories”, meaning cases where there is progress and some success in enabling collaboration across domains. It would of course have been equally informing, if not more so, to find cases of failure. However, I was dependent on finding people who were willing to grant me access, and I most often found people who wanted to share something positive which they were working on. Cases of failure, I
believe, would have been more difficult to get access to, simply because people generally are not as keen on sharing these.

An important aspect is also that, since this is a compilation of papers based on case studies, the type of cases chosen of course also affects the findings. My analysis highlights properties of collaboration routines based on their (positive) capacity to support shared learning across different domains. No doubt, there are cases where routines of this kind do not support successful development of collaborative practice. As Paper D indicates, there are plenty of potential sources of conflict. For example, hierarchy and the status of individuals are at stake when new constellations of specialists are formed. My papers do not highlight such things, which is partly because conflict was not my main focus, and hence I collected and analysed the empirical material using a different “filter”. It is also, once again, due to the process of case selection, which was prone to result in positive success stories. While I am aware that I have focused only on a few aspects out of many, I believe my focus provides substantial insight and makes a meaningful contribution to the literature on routines.

Looking back at the research process, it has been a journey with several detours, and it is evident that things could have turned out differently. For example, had I not latched onto the access I was granted to the case study reported on in Paper C, and had I not had the luck of being invited to study the case reported in Paper D, perhaps I would have ended up somewhere else, having seen completely different phenomena in my material. There is surely an ounce of serendipity, intuition and luck involved in the research process which has led to this thesis as it turned out. Having said this, and given the process which unfolded during my PhD studies, I believe my findings are of value and can substantially contribute to research on routines for collaboration.

3.1.3 A short reflection on the chosen design

A weakness of the chosen design is that case study data are specific to the context studied. Meanwhile, the knowledge-intense context of healthcare is in some respects representative of modern organizations. A context characterized by knowledge intensity is today relatively general, and the results can be expected to be applicable to a variety of settings. Since the empirical base in theory of routines is relatively thin, there is still a need to achieve empirical detail before testing over a wider population. Detailed, qualitative, empirical
data collection can provide the insights that are lacking. It provides the deep insight that can be used for more aggregate studies further on, for example by testing the generalizability of findings over a larger population, then using a quantitative approach.

An alternative design would have been to perform a longitudinal study, which would have allowed me to gain deeper insights into, for example, the process of creating collaboration routines across domains. Unfortunately, I did not have the right circumstances to do this. However, while this would have yielded further depth, it would not have given the same breadth as the current design, which includes three separate case studies.

Within the chosen research design, I would have liked to perform more observations, including in the form of shadowing. It would have benefited this thesis through the possibilities of observing interactions and comparing those to empirical material from interviews. Unfortunately, my access was limited and did not permit much observation. Yet, in light of the cases I did get access to, along with some observational data and the chance to informally spend time at the studied clinics, I believe I have been able to generate substantial findings.

3.1.4 How I went about studying routines

In practice, routines have a purpose. In healthcare, their ultimate purpose is often to deliver care to the patient. As explained above, a common way of categorizing sets of routines aimed at patient care is to use the care pathway. It contains a multitude of different routines, which together serve to deliver treatment to the patient through a series of stages. Most of my empirical material is from the care pathway of breast cancer care. Paper C deals with routines within screening, which can be regarded as the first part of the care pathway. Paper D deals with routines among surgeons and oncologists, which is a later part of this care pathway. In these studies, I focus on interactions among specialists from different domains, either in the creation or modification of routines, which encompass collaboration. In Paper C, specialists working in routine screening for breast cancer are engaged in collaboration with researchers, combining elements of their respective working practices in order to systematically conduct research for a new screening method. In Paper D, surgeons and oncologists engage in integrating their working practices in daily care. In Paper B, I isolate and analyse collaborative interactions within routines aimed at finding a treatment.
To study the integrative property of routines for collaboration across medical domains, I focused my analysis on the interactions between specialists in recurrent practices. How does interaction take place? Are there frictions, and if so, what is their source? How are frictions overcome? Through systematic analysis I attempted to isolate the collaborative aspects of routines in the studied contexts and investigate their role in the collaboration across domain boundaries.

Differentiating between domains is rather easy in healthcare since they are pronounced (e.g. surgery versus oncology). They distinguish themselves in terms of their epistemic practices, that is, their ways of working closely tied to their specialized knowledge base. As the empirical material presented in Paper D shows, surgeons and oncologists can have very different perspectives on care and use different practices to deliver care. As Paper C shows, the same is true for researchers compared to clinical personnel. In fact, the community created among people who specialize in the same area creates boundaries between themselves and others. This differentiation is not specific to healthcare but has been observed in other sectors (Howard-Grenville and Carlile, 2006). I differentiated between domains by asking, “What are these people experts at?” This often provided a practical way of categorizing my empirics. However, I did not include divisions which may exist within domains, such as those between physicians and nurses.

3.2 Data collection

To study routines for interdisciplinary collaboration, I chose several different cases that I perceived would shed light on this phenomenon. I surveyed the field in search of cases by informally attending workshops, presentations and conferences where medical specialists and managers actively discussed and worked on issues related to my studies. The cases I chose were also based on where I could get access for data collection. Table 2 provides an overview of empirical material.

In the study of Paper B, I was looking for typical cases of solving medical problems involving a search for a new treatment. Here I was interested in how things were typically done so that I could pick apart routines and compare different types of care. In contrast, in Papers C and D, I studied non-typical cases. These were both initiatives aimed at radically changing how work was
performed. I was looking for initiatives that would allow me to study the frictions in using routines to integrate the work of specialists from different domains.

Gaining access to collect data was always difficult, and I constantly found myself knocking on people’s doors. Healthcare is an area with high data confidentiality and much protected patient information. For this reason, I was denied the possibility to conduct observations in patient care processes. In interviews, I always promised my respondents anonymity, which allowed me to get more open answers from them as well as more details. To the extent possible, I used different methods of data collection, specifically, semi-structured interviews, observations and specific documentation related to the cases studied.

3.2.1 Interviews

At an early stage, I conducted interviews with medical managers, policy personnel and clinical personnel in senior positions, who could inform me on the organization of healthcare and the types of phenomena I was after, as well as guide me towards relevant informants. This allowed me to discover and locate the cases I have studied, and also provided a broader and more nuanced picture against which I could contrast my findings. In sum, I have conducted 65 semi-structured interviews. Each interview typically lasted between 60 and 120 minutes each. To avoid bias, gather multiple perspectives and be able to cross-check information, I always tried to interview several people in different positions about the same phenomenon. Interviews were for the most part focused on identifying and understanding specific interactions, hindrances and methods used to get past the hindrances. When I identified crucial events, I probed to understand these better and asked other informants about them to get a nuanced picture. Interviews were audio-recorded and transcribed either completely or partially, focusing on certain sections. There are pros and cons with complete transcription. It provides a written account of each interview in its entirety, which is helpful at early stages when it is necessary to go back to the same material several times. However, complete transcription may also be time consuming. As the studies developed, I reached a point of saturation, where only certain phenomena were the focus of further study. At these times, it was more efficient to focus my efforts on analysing parts of the interviews which dealt with these phenomena.
Through interviews with individual specialists I have been able to investigate routines “bottom-up”, from the perspective of interactions required among specialists from different disciplines. This allowed me to get “under the hood” of routines by gaining insight into their antecedents and characteristics, as well as to describe otherwise elusive mechanisms involved in building shared understandings and accomplishing joint tasks. Managing to get the depth in the interview took some practice to master. I always tried to structure my interviews and probe for relevant aspects, but I definitely got better at this towards the end of the study, as the early interviews could be of a broader character.

In each study, I focused on interactions between specialists and on why and how things were done. Even though “routine” is a common word, I did not want to rely solely on the informants’ understanding of the word. In my interviews, I used both the “theme” of routines and other themes relating to regular activities, interactions and challenges to try to keep focused on what was done, how it was done, and why.

3.2.2 Observations

I only had limited opportunities to conduct observations, but nevertheless the observations I did enhanced my material substantially. In the second study on development of a new method for breast cancer screening, I attended 8 hours of meetings (four meetings), including a presentation aimed at clinical personnel. By attending presentations (by clinicians for other clinicians) within the bounds of the cases studied, I could observe and understand their interaction. The observations allowed me to compare what was said in interviews with what was said and done in meetings, which provided additional data and provided an understanding of underlying rationales. Both when I was conducting interviews and in between formal observations, I took the time to talk to people informally, for example, at the coffee machine, to gain additional insights. In addition to formal observations, I informally spent time in the clinical environment and research unit of the studied hospitals in order to enhance my understanding of the specific context.

3.2.3 Documentation

When applicable, documentation allowed me to understand how an initiative was described formally, aimed at another audience. Analysing what was described and not, and in what manner, gave me a nuanced picture. In the cases where I was studying a formal initiative (Papers C and D), documentation
made it possible to gather background information. In Paper C, a web page and handouts regarding the initiative were part of creating new routines for collaboration among researchers and clinicians. In Paper D, detailed background information and a description of how new cross-clinical routines and working practices could aid clinical care provided valuable insight into the initiative of creating new cross-disciplinary routines in breast cancer care. In general, I could also use documentation as a form of triangulation to compare data from multiple sources. By becoming very familiar with the contexts I was studying, I could more easily ensure the validity of my data.

Table 2. Overview of empirical material.

<table>
<thead>
<tr>
<th>Study</th>
<th>Empirical case</th>
<th>Study C</th>
<th>Study D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study B</td>
<td>Comparative case study</td>
<td>Single case study</td>
<td>Single case study</td>
</tr>
<tr>
<td>Study C</td>
<td>Introducing the combination of exploration and exploitation in breast cancer screening</td>
<td>Forming routines across epistemic communities in breast cancer care</td>
<td></td>
</tr>
<tr>
<td>Study D</td>
<td>Search routines for new treatments in clinical healthcare, comparing two care types</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviews/observations</td>
<td>26 interviews</td>
<td>17 interviews</td>
<td>22 interviews</td>
</tr>
<tr>
<td>Documents</td>
<td>--</td>
<td>- Documentation of clinical routines and new X-ray technology</td>
<td>- Report about the initiative including background, organization and vision.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Documentation describing the initiative</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Data analysis

I generally started data analysis while the fieldwork was still ongoing. My data analysis evolved during the scope of my studies, partly because I became more familiar with the method, but also because I became more familiar with the studied phenomena and could more easily look for crucial events. I always started by summarizing notes directly after interviews and creating short case descriptions, which both aided my analysis and helped me gather key pieces of data from one interview in order to probe further in the next. I used “analytic memoing” (Miles et al., 2013) to continuously put down my reflections throughout the research process. For example, at interviews and observations,
I would almost always talk to people informally at the coffee machine, and I made it a habit to always note down thoughts and input from these short talks. Similarly, a lot of interesting material usually came through at the end of an interview, once I had turned off the audio recorder. Catching these scattered bits and pieces by noting them down in my notebook provided much additional insight and could guide further data collection.

I used different methods of coding and ordering data, such as Nvivo, mind maps and posters with “Post-its”. The latter methods proved the most powerful for me, as they gave me direct contact with my data in a way that Nvivo could not. In the later studies, I also listened to my interviews in detail by winding back and forth, making notes on parts that were of specific interest to me. For example, when studying the formation of routines across disciplinary communities, I could pick up the part about placing tape on wounds after surgery and probe further within this area in subsequent interviews. As my proficiency in qualitative data analysis progressed, I used more advanced coding schemes. In Paper D, I explicitly used first and second cycle coding (Miles et al., 2013) and created a formal data structure.

I chose the above-described methods of analysis – using codes and categories, and ordering these by, for example, using Post-it notes – because they allowed me to categorize and see patterns in my data. A challenge with qualitative data is that it is very rich in detail, which makes it difficult to interpret in its raw format. Therefore, I used qualitative data analysis to identify patterns, or a story, which could say something about the studied phenomenon. This was centrally about understanding how pieces fit together. For example, this could involve identifying what was difficult in a certain part of collaboration, why it was difficult, how the difficulty was overcome and so on. Of course identifying such patterns involved (subjective) interpretation. Everyone associates differently and thinks of different things when interpreting accounts of what people say and do. In this respect, the data structures presented in the papers (for example, Paper D) are interpretations, and the data could be interpreted in a different way than I did. However, having said that, I believe my coding and interpretation does provide increased knowledge of the studied phenomenon, offering a picture of general value.
4 Summary of the papers

This section briefly introduces each of the four papers comprising this study.

Paper A - Interdisciplinary collaboration in healthcare – A review of healthcare management literature.

Interdisciplinary collaboration is central in the discourse in healthcare management. However, such collaboration has proven difficult to achieve, and healthcare management literature devotes much attention to understanding the factors that inhibit and enable it (Mitchell et al., 2009). The paper critically reviews central contributions to the healthcare management literature of the past 10 years and analyses it by drawing on recent literature of organizational routines. The paper contributes to the literature on interdisciplinary collaboration by identifying and discussing three main themes: the need for interdisciplinary collaboration in healthcare, enablers and barriers to interdisciplinary collaboration, and identification of focused strategies and mechanisms for interdisciplinary collaboration. The paper cross-examines the identified themes and develops a more holistic view of the conflicts inherent in interdisciplinary collaboration. The roles of shared mental models, relational coordination and routines in interdisciplinary collaboration are discussed and put into the perspective of organizational routines, focusing on how to achieve the individual autonomy and collective cohesion identified as central for interdisciplinary collaboration. By suggesting how to combine the different strands of this literature, the paper provides guidance for future research.

Paper B - Collaboration for continuous innovation: Routines for knowledge integration in healthcare

Although scholars have found that routines can be both rigid and adaptable, the current high-level descriptions of routines lack the detail to account for this tendency in terms of mechanisms at the operational level (Felin and Foss, 2009). Paper B sets out to describe routines at the operational level. Using Becker’s (2005) framework, this paper “picks apart” routines and begins to explore which factors inherent in different contexts affect routine characteristics. A type of problem requiring adaptability and search is problems related to innovation. The aim of the paper is to explore how knowledge is integrated
in search routines for innovation, and how search routines differ between contexts. The empirical material is based on interviews.

The paper creates a framework for the analysis of search routines and exemplifies the forms of routines in two different contexts. The two contexts differ in terms of the complexity of the problem addressed and the whether or not several disciplines need to be involved to solve the problem. Routines are analysed in terms of antecedents and characteristics of the search process. The paper contributes to theory on routines by illustrating how organizations conduct structured searches for new knowledge, and how routines with different characteristics, matching the specific context, can support this.

Paper C – Finding the new whilst maintaining the old – introducing ambidexterity in clinical healthcare

In healthcare there is substantial pressure for exploration of new treatment methods, but the dependence on delivering uninterrupted care to patients preserves a focus on exploiting current methods to uphold short-term cost efficiency. Exploring new knowledge areas and exploiting current knowledge in parallel requires the organization to be ambidextrous, a term coined by Duncan (1976) to stress the difficulties in managing both types of activity at once. Paper C starts off from this identified tension and brings the analysis to the operational level where different problems are addressed through collaboration between specialists. The paper reports on an empirical case study of a breast cancer screening clinic which gradually integrates its high-volume screening procedures with research on new screening methods.

Clinical specialists engaged in exploitation have a certain mindset, focused on trying out different alternatives in the current organizational milieu. Research specialists, engaged in exploration, employ a different mindset, bringing focus to new areas. To combine both of these ambitions in the same clinic requires collaborative efforts among clinicians and researchers. By studying such collaborative efforts, the paper investigates the practices by which organizations may transition from an exploitative focus to one combining exploration and exploitation. The study shows how mandated measures such as performance reporting and operational planning interact with emergent mechanisms such as perspective shifting and awakening interest to create progress towards ambidexterity in the organization.
Paper D - Forming routines across epistemic communities – a study of interdisciplinary routine creation in breast cancer care

Modern healthcare is characterized by the need to handle increasingly complex patient conditions, such as comorbidity, where patients suffer from several conditions at once. This requires clinicians to collaborate across disciplines in structured ways. The aim of Paper D was to explore how routines spanning different medical specialties in breast cancer care are created. The paper draws on the theory of knowing communities (Boland Jr and Tenkasi, 1995, Cohendet and Llerena, 2008, Håkanson, 2010), highlighting that development of specialized knowledge poses a challenge to interdisciplinary collaboration in the organization.

The paper reports on a case study of the formation of routines involving specialists in surgery and oncology in breast cancer care. The results indicate an iterative process of boundary spanning, internal analysis and subsequent synthesis to form routines consistent with the practices of different disciplines. The paper contributes to literature on routines by investigating the role of knowledge communities in routine formation (cf. Cohendet and Llerena, 2003).
5 How routines can support collaboration across domains

This section presents an analysis that cuts across all four papers and attempts to draw more general conclusions on the nature of collaboration routines.

5.1 Functions of collaboration routines

In the studied clinics, specialists from different domains develop collaboration in order to address problems which require their combined expertise. The case studies deal with different situations, and taken together they can form a basis for a picture of how routines for collaboration across domains function. The papers provide insight into the functions of collaboration routines.

Idea generation. Routines can be used to generate ideas for new collaborative ways of working. This is exemplified in Paper C, where collaboration between specialists from different domains is supported by altering everyday routines. New technology is inserted, which spurs interest and ideas from clinicians. Routines used to screen for breast cancer thereby acquire a new purpose, which is to enable collaboration across domain boundaries. These alterations to current routines are complemented with new routines for knowledge exchange and discussion, used to continually evaluate and discuss progress and possibilities for collaboration. In this way new ideas for collaboration emerge and are put into practice.

Negotiation and testing of joint practices. Collaboration routines can be used for developing and testing joint practices. In the case studied in Paper D, this was an iterative process where specialists negotiated shared practices by learning about the practices of other domains, as well as reflecting on possible collaborations within the own domain. Routines for knowledge exchange were used to support this learning process. Possible new joint clinical routines were tried out and modified until they fit with the needs of both domains.

Structuring of trial and error. As described in Paper B, when working on a patient condition for which there is no known treatment, medical specialists from different domains use a routine based on the mechanism of trial and er-
ror. What one specialist does, may affect the next part of the treatment delivered by another specialist. The physicians thus have to adjust their own part of the treatment based on the results of the others. The specialists regularly gather to assess the results of their trials and together decide which direction they should take in treating the patient.

The above-described functions of collaboration routines can be understood as a response to the obstacles presented by domain boundaries. Using routines for idea generation mitigates the inability of specialists from different domains to see directly the benefits of collaboration (i.e. it addresses their lack of motivation to collaborate). Using routines for negotiation and testing of new joint practices can be understood as a response to the lack of shared knowledge required to find successful joint practices. Finally, using routines to structure trial and error serves to mitigate the difficulties in formulating a joint routine when the set of possibilities of each specialist is masked behind domain boundaries.

A central feature of collaboration routines is that they support the creation of shared meaning among individuals who belong to different thought worlds. The integrative function of these routines counteracts the differentiating properties of domains. The routines serve to enable the interactions required to continuously reconcile views between different specialists, spark interest among them, and share knowledge across domain boundaries. Specialists need to be willing to take part in collaboration and to know how to do it. They thus need to have a shared understanding of what the collaborative work implies and be willing to engage in it. Collaboration routines are the vehicle for the development of shared cognitive models and shared motivation.

As found in the review of interdisciplinary collaboration (Paper A), shared cognitive models have been found to constitute a cornerstone in collaboration across medical domains. In the empirical studies reported on in Paper C and Paper D, to create shared cognition among specialists it was essential that the management refrain from prescribing how collaborative work should take place. Instead, shared cognitive models were allowed to emerge, fuelled by the interaction among specialists from different domains. Using routines for experimentation, testing of joint practices and trial and error indicates the centrality of a bottom-up process, where collaboration is initiated through interaction on the hospital floor.
The above functions of collaboration routines suggest how they serve to build motivation among specialists for taking part in collaboration. Idea generation, negotiation and testing of joint practices as well as trial and error all engage specialists in the pursuit of something which they are to discover and, in a sense, define. The underlying logic of these practices is to support shared learning, where all specialists are engaged in contributing to a joint solution. Motivation for collaboration is built through the process of discovering new things together with people of different expertise. This is supported largely by providing the possibility for people throughout the organization to engage, within their daily work routines, in trying new approaches that make sense from their own perspective.

Our results can be compared to those of Edmondson and Zuzul (2016), who study routines in the context of a temporary project, where specialists from many different organizations come together to create a new product. Interestingly enough, our findings indicate generative functions similar to those described in their innovation study. The findings indicate that the essential element of these routines is the ability to engage actors in shared learning. In the cases studied here, this is a special kind of learning, where specialists build and develop collaboration across domains. They all have well-developed knowledge and practices within their own domains, yet need to find fruitful ways of integrating their expertise in daily practice with specialists from other domains in order to solve medical problems.

5.2 Collaboration routines support continuous routinizing

The empirical findings of this thesis resonate with a dynamic view on routines, highlighting their flexible properties. This thesis brings to the surface aspects related to collaboration across domains, which have previously not been given much attention in the literature on routines. In the cases studied here, dynamics are the result of continuous reconciliation of views and of practices among people with different specializations. Dynamics are fuelled by continuously having to handle differences in cognition and motivation among actors. This provides a new perspective on the role of routines.

In the case of collaboration across domain boundaries, routines take on the role of an integrating structure in an otherwise differentiated landscape of
competence and interests. This brings to the surface factors related to motivation, which have not received much attention in previous literature on routines (on this topic, see Cohendet and Llerena, 2008; Becker, 2005). It has been more or less implicit in studies of routines that, while actors in the organization surely have different interests, their mere participation in routine work signifies that they have, at minimum, agreed to disagree and to work together. This is the foundation for the proposition of routines as truce (Nelson and Winter, 1982). In this respect, routines have been thought of as a form of governance, guaranteeing continuous output despite the differences in interests which exist among people in an organization (Coriat and Dosi, 1995). Implicit in the definition of routines has thus been saving of cognitive efforts as well as their governing effect through the creation of truce (i.e. not giving space to the different wills among individuals). Meanwhile, studies in healthcare have found that the motivation cannot be taken for granted. Altering or developing new routines requires actively working with motivation to produce the required effort (Edmondson, 2003).

A central function of collaboration routines is to provide support to reconciliation of differences in views and practices. What was largely taken for granted in earlier conceptualization is here instead at stake. Since collaboration routines serve to enable collaboration, their ability to provide the required support for specialists from different domains in integrating their knowledge and formulating shared objectives is their defining attribute. This requires supporting increased interaction, and channelling joint efforts. In this capacity, collaboration routines are enabling structures, or platforms, for building collaboration across domains.

A crucial difference compared to situations where groups of specialists start implementing a new technology (Edmondson et al., 2001) or adopt a concrete shared goal to produce something new (Edmondson and Zuzul, 2016) is that in those scenarios specialists can, with time and through shared learning, be expected to converge towards a common understanding of how to work together on the specific task in question. The need to put effort into establishing collaboration is in those cases only temporary. In the situation studied here, on the contrary, the nature of domain specializations can be expected to produce the opposite effect, instead pulling apart specialists further as they develop their expertise and delve more deeply into their respective areas. This despite the fact that they may be working in the same institution or even on
Consequently, an integral characteristic of collaboration routines is the continuously ongoing efforts directed towards bringing together actors, both cognitively and in terms of motivation. These routines in a sense involve continuous routinizing, since their prime purpose is to enable the handling of the frictions which continuously surface among specialists from different domains. Collaboration routines are not merely the end result of organizational effort. They are part of an ongoing process, in which they have the role of a catalyst and enabler (cf. Rerup and Feldman, 2011). They make it possible for the organization to make use of its diversity in knowledge and practice. To borrow terminology from physics, domain specialization acts as a centrifugal force, continuously pulling apart specialists as they progress within their respective domains. To enable these diverse specialists to collaborate (and for the organization to function), the routines need to act as a centripetal force which pulls the specialists back towards a common centre (i.e. a common understanding).

Scholars have argued that routines have both mindful and mindless components (Levinthal and Rerup, 2006), and studies of routines have found them to be both emergent (Rerup and Feldman, 2011) and the result of directed effort (Edmondson et al., 2001). The findings of this thesis indicate that collaboration routines, in their role as enabling structures, come about as a result of a combination of these two processes. The functions of collaboration routines described above all have strong emergent components, where routines provide the structure that enables shared ideas and practices to come about across domains. Meanwhile, there is also a mindfully directed “top-down” effort to provide the means, or the infrastructure, for collaboration, for example, in terms of routines for knowledge sharing. Corroborating Edmondson and Zuzul (2016), leadership obviously has a role in providing the resources to start building collaboration across domains. Yet, while a supporting infrastructure can be created this way, it is clear from the studies that shared ideas and practices emerge through the resulting interaction across domain boundaries.

In collaboration routines, failure is accepted (where failure is an attempt at collaboration which does not yield the desired outcome). Iteration between different alternatives in order to find viable solutions is here a central component (see Paper D). This directly contrasts with earlier conceptualizations of
routines. If there was failure, this was not part of the routine, because routines were successful solutions to problems. In collaboration routines, failure can even be said to be part of their core, since it is part of learning. The learning logic governing collaborative efforts implies that routines will also lead to collaborations which turn out to fail. This is so because these routines are not blueprints for achieving a given solution but rather enablers for attempts at solving problems collectively. From a broader perspective, collaboration routines build on a new logic of organizing, where collaboration is placed at the forefront. Rather than eliminating variation and minimizing the need for interaction (Gersick and Hackman, 1990), collaboration routines increase variation in output and interaction among individuals. Collaboration routines make use of the diversity in knowledge and practices present in the organization.
6 Implications and contributions

6.1 Theoretical implications of collaboration routines

This thesis concerns routines as a means of organizing collaboration between specialists from different domains. An underlying assumption in early frameworks is that routines have a single predefined purpose and that they are carried out as blueprints to reach a desired goal (March and Simon, 1958). Routines have largely been seen as solutions to specific problems, at a stage where actors no longer need to question how and why things should be done in a specific way. Routines have thus traditionally been conceptualized as stable, which implied that actors had shared cognitive models and shared motivation to carry them out.

The more recent dynamic view on routines has suggested that routines are flexible structures which can accommodate change (Feldman, 2000, Pentland and Feldman, 2005). This thesis contributes to the dynamic view on routines by investigating routines for collaboration across domain boundaries in the organization. At the intersection of domains, there are often no set expert teams and no well-established way to carry out collaborative work. As Weinberg et al. (2011) point out, this is the most common situation in healthcare, where specialists are always on the move and team compositions continuously change. Based on three empirical studies of routines for collaboration across domains in healthcare, the findings of this thesis indicate how collaboration routines can serve to bridge domain boundaries and act as an integrating force.

The findings of this thesis suggest that collaboration routines enable the flexibility required to unite specialists in shared practices in a context where there is no prior ground for joint work. It thus corroborates studies highlighting the flexible nature of routines (Howard-Grenville, 2005; Pentland and Feldman, 2005). The present findings further point to a role of collaboration routines as a supporting vehicle for developing both shared cognitive models and shared motivation across domains. A central function of collaboration routines is to actively support the reconciliation of differences in understanding and motivation among actors. While each domain specialty has its own set of
knowledge, perspectives and practices, there is a need to reconcile and integrate these to enable collaboration. This requires creating shared understanding and willingness to contribute to a joint objective.

This thesis thereby suggests a different underlying logic of organization than is typically theorized in the literature on routines. In line with research by Edmondson and Zuzul (2016), we see that a cornerstone in routines for collaborative practice is learning, not doing according to a blueprint. In a knowledge-intense environment such as healthcare, with several domains of substantial knowledge depth, learning and innovation are core parts of everyday collaborative practice.

This thesis contributes to theory on routines by suggesting that a main function of collaboration routines is to support shared learning across domain boundaries. Shared learning requires continuous interaction, including such activities as testing of joint practices and generation of new ideas. This generative role of collaboration routines makes them a source of possible shared practices rather than ready-made solutions (Rerup and Feldman, 2011). By supporting shared learning, collaboration routines make it possible for specialists from different domains to develop shared understanding and shared goals in everyday practices. This function of collaboration routines, as support for an increase in interaction and cognitive effort among actors, contrasts with the earlier conceptualizations of routines as blueprints which eliminate frictions between individuals. Rather than being structures defining how to go about work, collaboration routines provide an infrastructure for engaging specialists.

Lastly, this thesis indicates that collaboration routines involve continuous routinizing. Since collaboration between specialists from different domains does not emerge once and for all, shared understanding and shared motivation among these actors need to be supported continuously. Differences between knowledge domains make it necessary to continually bridge the gap in order for interdisciplinary collaboration to be upheld. At the divide between domains, there are substantial dynamics involved in finding common ground and putting it into practice.
6.2 Policy implications

Organizing care to integrate different domain specialties in treatment of patients is a central aim for policy makers and managers (The Swedish Agency for Health and Care Service Analysis, 2016). This thesis indicates that a major task for policy in this area is to overcome the barriers to collaboration.

Collaboration cannot be created solely by top-down measures. While collaboration in its abstract form may be intuitive, it is less so when it comes to defining how one should achieve it. This is the difficulty in organizing interdisciplinary clinics. As the newspaper clip in the introduction shows, it is easy to say that medical specialists should collaborate, but it is very difficult to say how to get there. Policy makers and managers need to support the interdisciplinary organization in developing collaboration.

From a policy (or management) perspective, interdisciplinary care may benefit from a shift in how care processes, and their constituting routines, are regarded. Routines are often seen as means to increase control in an organization (March and Simon, 1958) and implemented with this purpose in mind. Not least in healthcare, there is a (natural) tendency to focus primarily on the task output of routines. However, as this thesis has indicated, interdisciplinary collaboration does not lend itself very well to this management logic. With its strength as a care method which freely combines knowledge from different domains comes substantial complexity and unpredictability, both in terms of process and immediate output. This may call for a shift in management principles. Rather than focusing on immediate task output, interdisciplinary care needs a focus on creating routines that generate useful shared understandings across domain boundaries. These shared understandings are essential building blocks of interdisciplinary collaboration. This implies that, contrary to the common logic of healthcare management, routines which do not accomplish immediate tasks may not be a waste of time.

This more nuanced understanding of collaborative routines can also prove fruitful in diagnosing problems that arise. Managers can evaluate how well the new interdisciplinary clinic is functioning in terms of collaboration and tailor interventions to enhance collaboration where required. Lastly, policy should view transformation towards interdisciplinary clinics as a gradual, incremental change, rather than the often desired “big bang”. Each domain’s knowledge and practices are a natural starting point for the new organization making it unnecessary to try to step straight into completely new ways of working.
6.3 Avenues for further research

This thesis has investigated collaboration routines in interdisciplinary healthcare. Yet there is still much to be understood regarding routines for interdisciplinary collaboration. An avenue for further research would be to use different methods than those used in this thesis. For example, one could perform longitudinal studies to learn how such routines change over time. It would also be of interest to compare these findings to similar studies in a broader population including other types of organizations. Healthcare has its specific characteristics, and it could be of interest to see if other sectors provide similar findings.
7 References


