Organizing Innovation in Health Care

A case study of patient pathways at Oslo University Hospital

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Abstract

Health care systems will face several challenges in the near future. Some relates to demographics, higher expectations and limited resources. Because resources are limited and the demand for health care services is high, a pressure is put on the health care system to find new ways of organizing health care services. Innovation and learning are two essential factors for a best possible organization of the health care system. It has been devoted increased attention to find solutions for how care processes can be organized efficiently and cost-effectively, while at the same time maintaining high quality medical care. Changing the organization of care processes entails changes in both the organizational aspect and service aspect. The process of implementing such complex changes requires close interaction and collaboration, much like an innovation process. The current study presents an innovation in cancer care, namely the implementation of case pathways and the development of cancer patient pathways at Oslo University Hospital (OUH). An investigation of how OUH organize improvement projects and foster incremental learning through practices supporting doing-, using-, and interacting has been conducted. In addition, the study has identified the prominent barriers experienced with the implementation of case pathways and improvement of cancer patient pathways.

Through the use of qualitative in-depth interviews with hospital staff at Oslo University Hospital and content analysis, this study has provided insights of how the use of incremental learning practices have increased the generation of ideas and implementation of innovative solutions. The hospital organizes improvement and innovation projects separate and use Leans tools to organize these improvement projects. The use of Lean tools with incremental learning practices were shown to be positive for generating novel changes and improvements of cancer care pathways. Complexity, culture, attitude differences, pace of change and absence of capacity for organizational learning was the prominent barriers. The cancer treatment process is similar to an innovation process, where interaction and knowledge-sharing are essential. Employing innovation literature and the DUI-mode of innovation framework are therefore suitable to study care processes in hospitals. In addition, findings in the study show the crucial importance of sound collaboration for incremental learning in a hospital environment.
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I did it!

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Abbreviations

CI – Continuous improvement

CP – Case pathway

CPP – Cancer patient pathways

DUI - Doing, using and interacting (mode of learning and innovation)

OECD – Organization for Economic Co-operation and Development

OUH - Oslo University Hospital

OUH CCC – Oslo University Hospital Comprehensive Cancer Centre

R&D - Research and development

STI - Science, technology and innovation (mode of learning and innovation)
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1 Introduction

Changed demographics put pressure on the health care system. People live longer and populations are growing in many countries. At the same time, health care becomes more advanced. More technologies are implemented, and the medical profession becomes more specialized. Over the last decade, stories have emerged about how patients have been thrown between different parts of the health care system (Dommerud, 2016; Hafstad, 2019; Solli, 2019). Patients have had to wait too long for treatment and experience an unpredictable course of treatment. All humans are dependent on receiving good care when needed and have an inherent trust and high expectations towards the health care system. When you are in need of health care, you trust that you will receive the best care possible and be prioritized throughout the process. However, because resources are limited and the demand for health care increases, the health care system may not be able to live up to such high expectations. These issues put an economic and quality pressure on hospitals, and will shape the way health care are formulated, delivered and assessed (Cunningham, 2005).

There is thus a need to find new ways of organizing health care services. Hospitals are knowledge-intensive organizations and face a complex challenge to optimize clinical outcomes with limited resources. Innovation and learning are therefore essential factors for a best possible organization of the health care system (Djellal & Gallouj, 2005; Metcalfe, James & Mina, 2005; Salge & Vera, 2009). Scholars and governments, as well as clinicians and managers at hospitals, have devoted increasing attention to find a solution for how care processes can be organized efficiently and cost-effectively, while at the same time maintaining high quality medical care (Campbell, Hotchkiss, Bradshaw & Porteous, 1998; Pearson, Kleefield, Soukop, Cook & Lee, 1995; Vanhaecht, De Witte & Sermeus, 2007). Changing the organization of care processes entails changes in both the organizational aspect and service aspect. The process of implementing such complex changes will therefore require close interaction and collaboration, much like an innovation process (Van de Ven, Polley, Garud & Venkataraman, 2008).

Innovation in the public sector has received increased attention over last decades, and an emphasis has been put on innovation in relation to continuous improvement (Bessant & Caffyn, 1997; Osborne & Brown, 2011). Innovation within hospitals are often focused on improving
care in different aspects, being research on new treatment regimes, implementing new medical technologies or effectively delivering services. The majority of studies on hospitals and innovation have focused on a narrow range of hospital activities, primarily concerning science-based innovations and implementation of new treatment regimens and technologies (Thune & Mina, 2016).

With this as a background, this study examine innovation in a hospital context based on two ideal modes of innovation: the science-, technology-, and innovation (STI) mode of innovation and the doing-, using-, and interacting (DUI) mode of innovation (Jensen, Johnson, Lorenz & Lundvall, 2007). Studies have revealed that hospitals are important generators of medical innovation and have strong indicators of the STI-mode of innovation (Jensen et al., 2007; Salge & Vera, 2009, 2013). However, the organizational capacity of hospitals to generate innovations and practices directed towards the DUI-mode of innovation have been underinvestigated (Djellal & Gallouj, 2005). In addition, few studies have addressed the question of how organizational characteristics and DUI-practices are beneficial for the generation of novelty or implementation of innovative solutions (Dias & Escoval, 2013; Garcia-Goñi, Maroto & Rubalcaba, 2007; Hernandez, Conrad, Marcus-Smith, Reed & Watts, 2013; Lee & Hong, 2014; Ugurluoglu, Ugurluoglu Aldogan & Dilmac, 2013). Research has called for contributions on hospitals as important generators of novelty and a further investigation into incremental innovations and practice-based innovation initiatives such as with subjective point of view from hospital staff because these activities often remain hidden and struggles to get attention (Djellal & Gallouj, 2005; Salge & Vera, 2009, 2013; Thune & Mina, 2016). This study aims to shorten this knowledge gap.

The present study describes an innovation in cancer care, namely the development of cancer patient pathways and the implementation of case pathways at Oslo University Hospital (OUH). The introduction of a case pathways was prompted as a possible solution to problems of long waiting time, lack of a streamlined process and coordination between different parts involved in a patient’s cancer care. With this case, the study attempts to highlight the importance of incremental learning in hospitals in light of improving a service embedded in daily practices. The thesis will focus on an innovation process that is incremental and organizational. The innovation in question can be viewed as a hybrid form between service and organizational innovation (De Vries, Bekkers & Tummers, 2016). However, in this study the innovation will be considered from an organizational viewpoint, where organizational practices and structures
are emphasized. Innovation as a term has different meanings depending on who is asked. The notion of innovation outside of academia, for instance among hospital staff, might blur the understanding of the concept. This study has therefore tried to break into the black box of the hospital with the purpose of contributing to a fuller understanding of innovation in hospitals.

1.1 Research questions

The overarching research question of this study is “How can hospitals best organize care processes to meet future societal challenges?”. The purpose is not to give a definitive answer to this question, nor is this possible due to the scope of this thesis. Rather, the aim is to contribute with insights on a how specific approach for organizing care processes have played out at Oslo University Hospital. To be able to provide this understanding, three specific research questions have been developed. These three are:

(1) How are innovation and improvement projects organized at Oslo University Hospital?
(2) How does Oslo University Hospital foster incremental learning?
(3) What are the perceived barriers of the implementation of case pathways and the improvement of cancer patient pathways?

The societal relevance of and theoretical motivation behind these research questions is thoroughly described in the closing section of chapter 4. By investigating these research questions, this study has revealed that collaboration and employee involvement are two components of great importance for hospitals’ innovativeness. Enhancing organizational practices such as suggestion blackboards and multidisciplinary team meetings, stimulated to knowledge-sharing between actors. This in turn generated the emergence of new ideas and learning opportunities and led to several improvements. The study also shows that the use of Lean tools and incremental learning practices can complement each other in innovation processes. The results underline that innovation at hospitals implies an intensive organizational development effort.
1.2 Thesis outline

This introductory part, chapter 1, has presented the research topics, research questions, the main findings and it will now provide an outline of the thesis. Chapter 2 presents the contextual framework and gives an elaborate explanation of the chosen case. The chapter begins by giving an overview of Oslo University Hospital, followed by an introduction of care pathways. The chapter concludes with a presentation of pathways in a Norwegian context, elaborating on the difference between case pathways and cancer patient pathways.

In chapter 3, the theoretical framework will be presented. The chapter starts with an introduction of the traditional innovation field where innovation is defined. Theories on learning and innovation, with an emphasis on the DUI-mode of innovation and incremental learning are also reviewed in this section. The next section introduces innovation in a public sector context before presenting innovation in a hospital context. Chapter 4 provides a description of the methodological approach and choices made in this thesis. The research process is described, including accessing the field, data collection and analysis. A reflection of ethical concerns concludes the chapter.

In chapter 5, the empirical findings and analysis is presented. The chapter is divided in four sections based on the research questions asked. The first section discusses how innovation and improvement projects are organized at Oslo University Hospital. Second, the perceptions of innovation and a discussion of the relationship between Lean and innovation is presented. The third section discusses how Oslo University Hospital fosters incremental learning and the relationship between tacit and codified knowledge in patient pathways is illuminated. The fourth section presents the barriers related to the implementation process of case pathways and the improvement process of cancer patient pathways. Last, the chapter ends with a discussion of how hospitals can organize care processes in the best way to meet future societal challenges. Chapter 6 will provide a summary of the research questions together with discussion of the overarching research question. Implications and limitations of the study are reflected upon and suggestions for further research are provided.
2 Contextual framework

This chapter will provide background information about the case studied in this thesis. The first section will give a brief overview of Oslo University Hospital with a presentation of the organizational structure. Following this section are a presentation of the concept care pathways, which case pathways\(^1\) (CP) and cancer patient pathways\(^2\) (CPP) have emerged from. The aim of this section is to provide an explanation of what pathways entails, and how it has become a widely used approach for organizing care processes. The next section begins with an illustration of the relationship between case pathways and cancer patient pathways, before the two concepts are described separately. The chapter ends with an introduction of the involved support functions at OUH.

2.1 Oslo University Hospital

Oslo University Hospital is Norway’s, and one of Scandinavia’s, biggest hospitals. The hospital has a budget of approximately NOK 22 billion and a staff of 23 000 people (Oslo University Hospital [OUH], 2019). Oslo University Hospital was founded in 2009 as a result of a merge between Aker Hospital, Ullevål Hospital, Radiumhospitalet, and Rikshospitalet. The hospital serves as a local hospital for parts of Oslo’s population, an emergency hospital for large parts of the Oslo area and a regional hospital for the population in the South East Health Region. The hospital is responsible for a number of national tasks and operates in over 40 locations. A large part of the medical research and education of health personnel in Norway is conducted at Oslo University Hospital (OUH, 2019).

Oslo University Hospital is a highly complex organization. The hospital consists of 14 divisions in addition to the unit Oslo Hospital Service, delivering non-medical services to the hospital (OUH, 2019). The hospital is organized after specializations with one line of management per division, commonly labeled as silo-organization. As Figure 1 illustrates the

\(^{1}\) The term case pathways refers to the Norwegian term “pakkeforløp for kreft”. The concept of case pathways is a Norwegian-Danish phenomenon and lacks an authoritative English term for the concept. The author has therefore developed an own term for the concept, case pathways. This is not an institutionalized term, but for the purpose of this study, case pathways will be utilized.

\(^{2}\) The term cancer patient pathways refers to the Norwegian term “standardiserte pasientforløp for kreft”. The concept is described by a range of different terms. The most common being clinical pathway, care pathway, integrated care pathway and coordinated patient pathways (De Bleser et al., 2006). Cancer patient pathways are used by scholars at Oslo University Hospital, which made the author decide to apply this term.
depicted divisions in orange are transversal, primarily delivering services to other clinics, while the blue divisions are specialized and deliver services connected to the respective division. Each division have underlying departments and units, each with their own line manager. The underlying departments and units deliver both medical and non-medical services, as well as being transversal.

**Oslo University Hospital**

Figure 1: Organizational chart of Oslo University Hospital (see appendix for higher resolution) (OUH, 2019).

The hospital’s size, complexity and structure complicate the course of treatment for patients. A patient diagnosed with for example cancer will have to engage with several clinics and departments, sometimes located at different locations. Figure 2 shows the clinics significantly in cancer care at OUH.
OUH has implemented an approach, commonly referred to as care pathways, as a solution to make the care process more efficient for the patients and increase the quality of cancer care in addition to laying the foundation for better interaction in the care process between the health care professionals (Iversen & Bjertnæs, 2016). The next section will give an introduction of the concept of care pathways, following with a presentation of how this concept has been customized to a Norwegian context.

### 2.2 Defining care pathways

Care pathways have become a popular method to standardizing care processes. Budgets, quality goals and political directives demands closer interaction in a fragmented healthcare system and are pressing for a need to streamline and standardize processes (Halvorsrud & Skjuve, 2018). Care pathways considers the journey a patient will experience during his/her course of treatment, all the way from diagnosing to the end of recovery phase (De Bleser, Depreitere, Waele, Vanhaecht & Sermeus, 2006). Care pathways represents a method which formalizes a patient’s journey by standardizing the different procedures and processes that are conducted throughout the process, such as sending/receiving referrals, sharing information with patients, taking MRIs, and more. It is a method for monitoring the processes with the
The purpose of reducing the length of stay, in addition to designing care plans for implementing care governance and streamline the delivery of care (Campbell et al., 1998; Vanhaecht et al., 2007). The overall goal is to improve the quality of care. Standardization is a way of making use of the available knowledge optimally, evidence-based, and systematically describe it and put it into a system, by i.e. specify the content of work processes (Mintzberg, 1979). Standardization is a type of language that represents codes for diagnostics and treatments in the medical profession. By having standard codes, everyone will speak the same language and the interaction will run more smoothly. The purpose of standardization in medicine is to create quality assurance and reduce variation that cannot be medically justified (Iversen & Bjertnæs, 2016).

Pathways include two contextual elements; national action plans and the pathway itself. These two are linked together and illustrates the coordination. The core of care pathways is a single common understanding about procedures and processes and how to make the right diagnosis and choices of treatment. In addition to the medical aspect, interdisciplinary knowledge is important for the process to run smoothly. Today, care pathways are implemented in healthcare systems worldwide as a method to make care processes more transparent and standardized and to improve the efficiency and quality in line with a patient-centered care concept (Vanhaecht et al., 2007).

Although care pathways have been used for over two decades there is still great uncertainty surrounding the concept in terms of the definition, the actual use and purpose, the dissemination and knowledge sharing, the methods used to develop and implement pathways, and the effect of pathways on outcomes (De Bleser et al., 2006; Vanhaecht et al., 2007). De Luc (2001) found 17 different terms used to describe the concept. The lack of an agreement on one definition makes the concept confusing and the usage unclear. One misconception is that care pathways only represent written instructions in patient’s records and a “blueprint” of care processes (Vanhaecht et al., 2007). Care pathways require that the entire process of care is discussed and shared by multidisciplinary teams, continually working with improving the quality of care. An unrecognized purpose of care pathways is actually to promote the involvement of clinicians in quality management (Berwick, 1992). The uncertainty concerning the dissemination and knowledge sharing relates to the fact that multidisciplinary teams, both within the same organization and across institutions, do not share their practical knowledge on how care processes are organized (Vanhaecht et al., 2006).
The confusion around care pathways also involves all the different methods used to develop, implement and evaluate a pathway. Care pathways are developed and implemented by healthcare professionals, with little knowledge of quality management and pathway methodology, and with little input from patients (Vanhaecht et al., 2007). Despite several papers and research on care pathways, the effect of pathways on outcomes remains unclear (Pearson et al., 2001; Sermeus et al., 2005; Trowbridge & Weingarten, 2001). The mentioned uncertainties make it hard to develop and implement care pathways, as well as evaluate and study them. It reduces the understanding of healthcare professionals on the new practice being implemented and what the impacts will be.

2.3 Pathways in Norway

In Norway, the concept of pathways is twofold. The first concept, cancer patient pathways, reflects the concept described above. The second concept, case pathways, is a type of pathway developed explicitly as a time-based schedule for cancer and stroke patients, and later also for mental health patients (Directorate of Health, 2019). This study will only discuss pathways in relation to cancer patients. Because the two concepts are so closely intertwined it can be confusing to follow along with the discussion. When the discussion revolves around the concepts as two distinct processes the respective terms will be used, being case pathways and cancer patient pathways. In other cases, the concepts are discussed in general, i.e. on organizing care processes of a cancer patient’s journey. Here, the terms patient pathways or pathway-approach are applied. An illustration and brief explanation of the differences is presented as an attempt to reduce the confusion, before a closer introduction to the two concepts are presented.

2.3.1 Illustrating the difference between cancer patient pathways and case pathways

The concept of case pathways and cancer patient pathways merge and are overlapping in both elements, goals and requirements. The differences between the two have emerged as a Scandinavian phenomenon, making it difficult to provide an adequate explanation in English. Case pathways are in fact based on cancer patient pathways and included as a small part of cancer care pathways. The main difference between the two concepts is the complexity, length and level of details described in the pathways. Case pathways only apply to a limited part of a
cancer patient’s course of treatment, while cancer patient pathways cover the entire journey of the patient from admission to the hand-over to the primary health care system (Oslo University Hospital Comprehensive Cancer Centre [OUH CCC], 2017). Case pathways describe how and how quickly examination and treatment should be organized. They do not interfere with the actual examination and treatment of the disease. This is covered by the national action plans. The normative times in case pathways are set from when a referral is received to the start of treatment at the hospital. Thus, case pathways only cover a limited part of the cancer patient pathway. Figure 3 illustrates the difference between the two pathways.

The new National Cancer Strategy (Department of Health and Care Services, 2018) states that the Directorate of Health has been given the task to develop “case pathway home” for cancer patients. “Case pathway home” will include follow-up of patients after having undergone treatment in the specialist health service and will ensure the patient’s needs in the transition from hospital to primary care service (SINTEF, 2018). The implementation of “case pathway home” has not yet begun at Oslo University Hospital and will therefore not be discussed further in this study.

Case pathways are used as an indicator to measure whether the hospital manages to perform the necessary care within the normative times, and thus if the pathway fulfill its purpose. This requires good communication, coordination and sequencing of the activities in the care process. In other words, the success of a case pathway for any given cancer diagnosis are dependent on a well-functioning cancer patient pathway.

![Figure 3: The limited part case pathways cover of cancer patient pathways (SINTEF 2018).](image-url)
2.3.2 Cancer patient pathways

The definition used for cancer care pathways is based on The European Pathway Association’s definition and states that “a care pathway is 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” (European Pathway Association, 2007). Cancer patient pathways are described as holistic, knowledge-based and standardized pathways that will help all patients to get the right treatment at the right time. The pathways should be customized to each individual patient’s situation and needs. Zander and Bower (2000) states that pathways are used for high volume, high cost, high risk and high predictable patient groups. Cancer patients fit these descriptions, making it a suitable patient group to use the pathway-approach for. The foundation of cancer patient pathways are national clinical guidelines based on best practice, evidence and patient’s expectations and characteristics. The goals and key elements comprising a pathway include facilitating communication, coordinating responsibilities and roles engaged in the process, and sequencing the activities of multidisciplinary teams, patients and their relatives (Campbell et al., 1998; Directorate of Health, 2016; Vanhaecht et al., 2007). In addition to this, the purpose is also to enhance the quality of care by increasing patient satisfaction, decrease unwanted variations and risks in treatment and use resources more efficiently.

The multidisciplinary teams (MDT) consist of all main professions involved in patient care (Directorate of Health, 2016). The team discusses all the relevant aspects about the patient’s case before making a recommendation for treatment. The clinical decision is made together with the patient. The fact that the patient acts as a co-decision-maker is an important element to the pathways. Sharing information and talking with patients and their support system is a significant part of the care process. Patients should feel well-informed, be involved and given the opportunity to participate in their own course of treatment (Directorate of Health, 2016). Figure 4 illustrates an example of the examination and diagnostic part of a cancer patient pathway.
2.3.3 Case pathways

A case pathway is a type of care pathway with the purpose of enhancing the predictability and safety of a patient’s course of treatment, and to improve the quality of cancer care and the follow-up of patients with other diseases. Case pathways are defined as a “standardized care pathway that describes the organization of examination and treatment, communication and dialogue with patients and relatives, and responsibilities and pathway times” (Directorate of Health, 2016). The concept of case pathways was first introduced in Norway in 2014, when the minister of Health and Care services, Bent Høie, launched the political directive “The patient’s health service” (Department of Health and Care Services, 2015). The main message was that the Norwegian healthcare system should aim to organize around patients’ needs. One of the measures Bent Høie wanted to be taken was to decrease waiting time for cancer patients, from the initial diagnosis to the start of treatment. Another course of action was to increase the overall quality of care.

The Norwegian Directorate of Health was given the instruction to define standard models at a national level based on a Danish model. The concept was developed in Denmark as a response to a sense of urgency. Changes had to be enforced because the situation was not medically justifiable. Case pathways was a solution for the lack of control on the length of the wait between different steps in the care process and high expectations, and also as a response to new research that stated that time was a crucial matter in cancer treatment (Directorate of Health, 2015). Case pathways had resulted in significant effects on the waiting time in Denmark and
inspired Bent Høie to implement the same approach in Norway as well. In 2015, 28 case pathways were developed nationally in Norway for the most common cancer diagnoses (SINTEF, 2018).

The case pathways are normative and have to be customized locally to the hospitals and to each individual patient (Directorate of Health, 2015). However, the normative times varies between the respective case pathways, and are the same for all hospitals. The overall goal is to ensure patient predictability by meeting the challenges of variation, waiting time, examination and treatment through the standardization of procedures. A case pathway divides the care process into different phases and defines the number of days necessary to make a logistically and justifiable medical decision in each phase. These days will thereby specify the proper and justifiable waiting time for patients. An important part to note here is that all patients, including those that does not need immediate treatment, should not wait any longer with respect to the mental stress. The normative times are compiled from cancer care pathways and does not take existing limitations of resources and capacity into consideration (Directorate of Health, 2016). There are specific codes related to each phase in the pathway that hospitals have to document throughout the pathways.

High quality patient pathways require capacity at all sites, good coordination of logistics and cooperation on clinical and diagnostic decisions (OUH CCC, 2017). To support this, it was required to establish structures and different roles; pathways managers, pathway management group, multidisciplinary team meetings, and patient pathway coordinators (Directorate of Health, 2015; OUH CCC, 2017). Pathway managers (physicians) are appointed after recommendation from the Oslo University Hospital Comprehensive Cancer Centre (OUH CCC) board. The managers include in the pathway management group along representatives (mainly physicians such as oncologist, surgeon, radiologist) from all involved departments and units, and pathway coordinators (OUH CCC, 2017). The manager and management group are responsible for documenting a cancer patient pathway and organizing improvement of the pathways. Pathway coordinators are the patients’ and relatives’ primary contact. The main responsibility is to ensure good flow in patient logistics within and between departments, coherence of the activities throughout the pathway and act as the hospital’s contact person to the patient and primary healthcare (Directorate of Health, 2016). A patient often has several coordinators during their pathway. The coordinators belong to their own department and transfer the patient to the next coordinator when another department gets involved. The purpose
is to give patients an experience of a well-organized, comprehensive and predictable course of treatment (Directorate of Health, 2016). Figure 5 shows an example of a case pathway.

Figure 5: Example of a case pathway (Directorate of Health, 2016).

Because of the comprehensiveness of the two pathway-approaches and the complexity of Oslo University Hospital, there are several functions involved in overlooking the operation and to further develop and improve the pathways. The next section will give a brief introduction to some of the central functions involved with pathways.

### 2.3.4 Hospital functions involved with patient pathways

First and foremost, the clinics and departments have the responsibility to implement the structures and procedures associated with the pathways. As mentioned earlier, there are 28 case pathways. Each pathway follows the journey of the patient, not the structure of the hospital. The department for nuclear medicine for instance, where radiology belongs to, will therefore be involved in a majority of the 28 pathways. When it comes to constructing the cancer patient pathways, the process complicates. Some begins in one clinic, the pathway for prostate cancer
for example starts in the Division of Surgery, Inflammatory Disease and Transplantation. If the patient needs treatment, they are referred to the Department of Cancer Treatment, which conduct the cancer treatment and the actual cancer part of the pathway. However, the goal is that the patient experiences a holistic pathway, without noticing the transfer of responsibilities. An in-depth discussion of the complexity of the pathways and the distribution of responsibilities will be found under chapter 5.

In any case, the different divisions and departments are reliant on support mechanisms, here related to ancillary departments at the hospital. Some of these include the Network for Continuous Improvement, Innovation Department, the Comprehensive Cancer Centre Board, and Section for Organizational Development. These have all assisted with the implementation and development of pathways in different degree. See table in the appendix for a briefly explanation of the role of each of the support functions. The information about the role and tasks are based on information gathered during the data collection.
2.4 Summary

This chapter has introduced the research area and provided relevant information about the concepts under study, namely case pathways and cancer patient pathways. A presentation of how the two concepts are related, yet diverse, have been discussed. In addition, information of how the concepts have emerged and been introduced in a Norwegian context.

Even though the two concepts for pathways are intertwined, there are some apparent differences. To put it simple, cancer patient pathways had always been in the works at Oslo University Hospital, while case pathways was a new approach introduced by a politically motivated process. OUH had to make local adjustments to the case pathway approach, both in regard to the complex structure of OUH and political demands to monitor and publicize the results of the pathways. The case pathways introduced a new set of measurement, waiting times, which involved a shift in focus and prompted changes in the service delivery at OUH. The most commonly used performance measure at hospitals are patient survival. And while this is still the main focal point, the case pathways prompted increased attention at the service aspect. One can argue that pathways serves a twofold purpose: the service aspect on the one hand, where the goal is to give patients a predictable, safe and good experience. On the other hand, there is the organizational aspect, where the goal is to deliver high quality patient care efficiently. To be able to fulfill this purpose, there is a need for organizational changes as well as changes in the service delivery.
3 Theoretical framework

This chapter will present the theoretical framework used in this study. The first section outlines definitions of innovation and innovation processes. The following section discusses innovation in more specific contexts relevant for the case under study, the public sector in general, and health care more specifically. The chapter ends with a presentation of the more specific theoretical framework applied and the research questions. This thesis applies two ideal modes of innovation as a theoretical framework: the science, technology and innovation mode (STI), and the doing, using and interaction mode (DUI) (Jensen et al., 2007). This study will have an emphasis on the importance if the DUI-mode of innovation in a hospital context.

3.1 What is innovation?

Because the literature on innovation is complex and to a large degree multidisciplinary, there are several different definitions of innovation. It involves research from fields such as economics, sociology, political science, economic geography, management studies. According to Fagerberg (2005), innovation is setting an invention alive: “invention as the first occurrence of an idea for a new product or process”, while innovation is “the first attempt to carry it out in practice”. The central innovation scholar Schumpeter states that innovation can be distinguished as new products, new production method, new sources of supply, exploiting new markets, and new ways to organize the organization (Fagerberg, 2005). OECD (OECD, referred in Oslo Manual 2018) has used such central innovation theory when they defined innovation as “a new or improved product or process (or combination thereof) that differs significantly from the unit’s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)” (p. 20). These are the definitions that will be applied in this thesis. The presented definitions are in line with the “Schumpeterian tradition” and defines innovation broadly. They emphasize innovations not only as an improvement of a product and getting it to the market but includes the innovation process and organization of innovation. Research has also uncovered that innovation has a greater importance not only in companies that carry out manufacturing, but also in societal improvements such as in the public sector (Damanpour & Schneider, 2009; De Vries et al., 2016; Osborne & Brown; 2011).
Innovation often occur through a re-combination of existing knowledge from actors and their respective knowledge bases (Bloch & Bugge, 2013). Organizations therefore need to organize their use and acquisition of knowledge. Knowledge can be defined as what an individual knows, which emphasize that knowledge is a dynamic and ongoing process (Nonaka, 1994). Knowledge are created when information is combined with experiences and put in context. One distinction that has been made of knowledge are between tacit and codified knowledge (Jensen et al., 2007). Codified knowledge is knowledge that is explicitly written, e.g. recipes or instruction manuals, and can be transferred to and absorbed by individuals who understand the language (Jensen et al., 2007). Much of the knowledge existing within individuals is subjective and tacit. This knowledge will never be transferred and codified unless there is a social interaction and development of shared understanding and common interpretive systems (Lam, 2005). The creation of organizational knowledge is constituted by the process of mobilizing individual knowledge and fostering social interaction. Organizational knowledge is essentially about developing shared cognitive systems and common understanding within the organization that facilitates knowledge sharing and transfer (Lam, 2005).

### 3.1.1 Types of innovation

Innovations can be classified according to their types (Fagerberg, 2005). Given the broad definitions, the categorizations of the different types of innovations often specifies the concept (De Vries et al., 2016). Most common typologies are product innovation, process innovation, service innovation and organizational innovation (Edquist, Hommen & McKelvey, 2001; Fagerberg, 2005; Lam, 2005). The three former types are used to characterize the occurrence of new or improved goods and services, and improvements of quality and efficiency of external or internal ways to produce these (De Vries et al., 2016; Fagerberg, 2005). The latter innovation type, organizational innovation, refers to the creation or adoption of an idea or behavior new to the organization. This includes new management systems, new methods of organizing work responsibilities and decision making, new ways of organizing external relations and new systems for gathering knowledge and building innovative capacity (Bloch & Bugge, 2013; Lam, 2005;). The innovation categories often intertwine in practice, creating hybrid forms (De Vries et al., 2016; Hartley, 2005). For instance, service innovation often requires organizational innovation.
The literature also distinguishes between radical and incremental innovation. Innovations are often associated with fundamental advances in products or services, which are conceptualized as radical innovations. These create disruptive changes and involves a significant impact on the market (Fagerberg, 2005). The novelty of such innovations include reinvention, which means the organization will be the first to develop and introduce innovation. However, the novelty may also include adaption. Adaption entails that the innovation already has been introduced but others, but the innovation is redesigned to fit another context and thus makes it novel for the given context (Bloch, 2011). Such innovations are termed incremental. Incremental innovations are significant improvements of existing products, services or processes resulting from a simple adoption or change (Fagerberg, 2005; Djellal & Gallouj, 2005). The majority of successful innovations are often a result of minor changes made in creative combination of existing ideas, methods and techniques (Ugurluoglu et al., 2012).

3.1.2 The relationship between innovation and improvement

A concept related to incremental innovations and learning processes are continuous improvement (CI). Many consider continuous improvement as innovation, while others relate it to incremental change with emphasis on waste reduction and quality improvement, often related to concepts like Lean-thinking (Bessant & Caffyn, 1997; Osborne & Brown, 2011). Lean-thinking can be viewed as a system seeking to redesign organizational processes to reduce waste and control cost by using analytical tools and techniques combined with creating a culture for continuous improvement (Browning & Sanders, 2012). Bessant and Caffyn (1997) emphasized that CI is related to the effort to increase participation in innovation processes within organizations. It can be characterized as an evolutionary learning process associated with acquiring and routinizing key behavior patterns and diffusing them across the whole organization. Continuous improvement is defined as “an organizational-wide process of focused and sustained incremental innovation”, recognizing that many innovations is not the breakthrough-type, but incremental in nature, as a process of systematic elaboration and development or original ideas (Bessant & Caffyn, 1997, p. 4). This definition can be viewed as a convergence of the principles of Lean and innovation. Even though innovation can take many forms, they all share the common feature that they involve high levels of incremental problem-solving concerned with systematically improving understanding and operation of the innovations (Bessant & Caffyn, 1997). Inputs from specialists is critical for the success, but there are usually limitations in the capacity they have to participate in all the problem-solving
activities involved. This acts as an argument for increasing levels of involvement in the incremental problem-solving processes of an innovation process (Bessant & Caffyn, 1997).

3.1.3 The innovation process

Innovation system theory emphasizes that innovation does not happen in isolation but depends upon the interaction between many actors that take part in and play different roles in an innovation process (Bloch & Bugge, 2013). The entire innovation process does not only consist of individual actions but involves several events from initiation to implementation or termination that vary in number, duration and complexity (Hernandez et al., 2013; Van de Ven et al., 2008). Innovation activities are what comprise the inputs to the innovation process, while at the same time providing information on what types of activities are undertaken in the innovation process itself (Bloch, 2011). One approach views the innovation process as progressing through a series of stages of development, such as invention-development-testing-commercialization (Van de Ven et al., 2008). These stages follow each other in a predictable manner and the activities within each stage achieve stability through a process of trial-and-error learning (Van de Ven et al, 2008). This process is applicable for innovations that stem from scientific breakthroughs (Fagerberg, 2005). However, most innovations do not stem from scientific breakthroughs, and the processes are not a linear one. In most settings, the process is random and interactive, where innovation is a result of collaboration among actors (Albury, 2005; Fagerberg, 2005; Kline & Rosenberg, 1986; Van de Ven et al., 2008).

The innovation process can be defined as “new ideas that are developed and implemented to achieve desired outcomes by people who engage in transactions (relationships) with others in changing institutional and organizational contexts” (Van de Ven et al., 2008, p. 7). Innovation processes are often initiated on the basis of specific problems that needs to be solved, or to make existing products or services more efficient. An example that is relevant for this thesis is hospitals’ ability to treat the required number of patients in best and most efficient manner (Koch & Hauknes, 2005). For innovation to be an output of collaboration and problem-solving, the actors involved must learn. Learning and innovation are therefore closely intertwined. This calls for the importance of understanding the role of organizational learning in fostering or inhibiting innovation (Lam, 2005).
Learning can produce innovation when there is a complex interplay of processes between individual factors and organizational culture. This production of innovation is based on contributions by the employees. In this case, innovation is embedded in daily work activities and social processes in the organization. To understand how the interaction and collaboration results in the accumulation of knowledge and thus innovation, one must understand the context of the interaction (Lam, 2005). A successful innovation process that leads to a solution to a specific problem, and thereby a successful innovation, requires access to relevant in-house and outside competence and an organizational culture and structure that encourages learning and innovation processes (Koch & Hauknes, 2005).

### 3.2 Modes of innovation and learning

Treating the organization as a learning system emphasizes the important role of internal organizational dynamics, actor cognition and behavior in shaping the external environment and outcomes of organizational change (Lam, 2005, p. 140). Lazonick (2005, p. 30) claims that one has to understand the learning processes that take place in order to understand innovative organizations. The relationship between tacit and codified knowledge and between individual and collective innovation capability are of special interest. The way organizations organize and exercise innovation processes and what types of knowledge that are central to the process represents different modes of innovation. Lundvall and Johnson (1994) developed a more elaborate set of distinctions for knowledge; know-what, know-why, know-how and know-who. Learning the different types of knowledge happens in different ways and through different channels. Important aspects of know-what and know-why can be gained through reading books and participate in lectures, while the two latter are embedded in practical experience. Know-how is usually learnt in apprenticeship relations, where the trainee observes the master. Know-who is learnt in more specialized educational settings (Jensen et al., 2007). Jensen et al. (2007) write about the tension between the emergence of two ideal modes of learning and innovation. The first mode is based on the production and use of codified scientific and technical knowledge, commonly known as the science, technology and innovation mode of innovation (STI). The second mode is based on practical experience and learning, commonly known as the doing, using and interaction mode of innovation (DUI).
The STI-mode of innovation is often related to R&D activities and refers to the way organizations use and develop know-why knowledge in the context of their innovative activities (Jensen et al., 2007). Given the complexity of science-based innovation projects, there are often a limited number of highly qualified staff members that are involved, and the projects are often conducted in R&D-laboratories. The measures used to capture STI-mode of learning are expenditures on R&D, the employment of personnel with third-level degrees in science or technology and cooperation with researchers attached to universities or research institutes (Jensen et al., 2007). It is of great importance to make knowledge explicit and translate the problem into scientific codes in order to share knowledge outside the organization. The initiatives to science-based innovation are often formally organized and attract great attention within the organization (Salge, 2012).

The DUI mode relates to arenas for mobilizing tacit knowledge for problem solving and learning (Jensen et al., 2007). Having information, that being codified presentation of data, is of no value unless you have the relevant competences to understand the information (Koch & Hauknes, 2005). The DUI-mode of learning refers to know-how and know-who knowledge. These two types are characterized by tacit and locally embedded knowledge. While STI calls for codification and for general codes, the DUI-mode thrives on the basis of implicit and local codes (Jensen et al., 2007). It is a major task for knowledge management to make the two versions work together in promoting knowledge creation and innovation. Learning can be formal, non-formal, and informal, where the latter represents learning as spin-off effects of activities (Høyrup, 2010). Practice-based innovation is a term linking learning and innovation together and occurs in daily work activities as an informal process. It indicates that the innovation process is based on the experience, knowledge and skills which employees have acquired by engaging in the working processes of the organization (Høyrup, 2010).

Learning are often random but can also be fostered by constructing structures and relations that improves and uses DUI. The diffusion of particular organizational practices that increases the organizational capacity for responding to changes and technologies are important. This includes practices designed to increase employee-involvement in problem-solving and decision making (Jensen et al., 2007). Organizational practices such as project teams, problem-solving groups, and task rotation promotes learning and knowledge sharing and can contribute positively to the innovation performance (Jensen et al., 2007). A stronger relation with the users and services outside the organization is a prerequisite for practice-based learning that
supports innovation in the DUI-mode. Employees are an important entity for innovation, much due to their experience-based knowledge and information derived from their close contact with customers and users (Høyrup, 2010). Employees can exchange practical knowledge and know-how in daily work activities in informal internal networks. Nelson (2004, p. 458) state that knowledge about why practices work, not only the acceptance that they work, are essential because new developments confront the practices with new problems. This point illustrates why the DUI-mode of learning are crucial for the success of innovations (Jensen et al., 2007). Finding solutions to these problems improves the employees’ skills and knowledge. The problem-solver can gain both specific and generic learning as outcomes of the problem-solving process. Organizations accumulate know-how and tacit knowledge in the course of their development, and the resulting organizational routines and skills become core competences and are difficult to change (Lam, 2005). There is thus an overall agreement that new knowledge and learning result in innovations. Table 1 provides an overview of the indicators for the STI- and DUI-mode of innovation.

<table>
<thead>
<tr>
<th>STI-indicators</th>
<th>DUI-indicators</th>
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<tr>
<td>• Expenditures on R&amp;D</td>
<td>• Interdisciplinary workgroups</td>
</tr>
<tr>
<td>• Employment of personnel with third-level degrees in science or technology</td>
<td>• Quality circles</td>
</tr>
<tr>
<td>• Cooperation with researchers attached to universities or research institutes.</td>
<td>• Systems for collecting proposals</td>
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<tr>
<td>• Interdisciplinary workgroups</td>
<td>• Autonomous groups</td>
</tr>
<tr>
<td>• Quality circles</td>
<td>• Integration of functions</td>
</tr>
<tr>
<td>• Systems for collecting proposals</td>
<td>• Softened demarcations</td>
</tr>
<tr>
<td>• Autonomous groups</td>
<td>• Cooperation with customers.</td>
</tr>
</tbody>
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Table 1: Indicators for the STI- and DUI-mode of innovation (Jensen et al., 2007).

The measures Jensen et al. (2007) used to capture DUI mode of innovation are based on two strands of literature, ‘high performance work systems’ literature and literature that draws on the relation between organizational design and innovation. This literature distinguishes between bureaucratic and rigid organizations and flexible organizations which shows stronger capacity for learning and innovative response (Jensen et al., 2007). The first four of the DUI-indicators measure whether the organization applies core-high performance work practices, while the latter two captures the difference between hierarchical and rigid organizations and flexible and decentralized structure of learning organization. “Cooperation with customers” are included as a measure to capture learning by interacting.

Different organizations will show variated intensity in practicing the different modes of innovation. The innovation literature has traditionally been biased towards the private sector and high-tech industries, basing frameworks and conceptualizations on the characteristics of
these industries (Von Tunzelmann & Acha, 2005). However, innovation happens in different contexts, and during the later years a growing attention has been devoted to the public sector much because of the notion that innovation can contribute to improve the quality of public services as well as enhancing the problem-solving capacity in dealing with societal challenges (Damanpour & Schneider, 2009; De Vries et al., 2016; Osborne & Brown; 2011).

### 3.3 Innovation in the public sector

A consequence of the bias towards the private sector in the field of innovation studies, is that definitions of innovation traditionally relate to market mechanisms and technological aspects (Fagerberg, 2005; Schumpeter, 1934). The literature on innovation in public sector has up until recently been scarce (Bommert, 2010; Hartley, 2005; Mulgan & Albury, 2003). The traditional definitions are incompatible in the context of the public sector, but because of the growing attention new definitions of innovation in public sector have emerged (Moore, Sparrow & Spelman, 1997; Mulgan, 2007). These definitions put a larger emphasis on the criteria that innovations must be significantly improved, useful and create public value. The definition introduced in the Oslo Manual was originally designed for the business sector but has applied for public sector innovation as well. A drawback is though on the emphasis put on the market and product innovation. But by redefining the implementation criteria from market to “made available to users”, the hurdle is overcome (Gault, 2012, p. 123).

The novelty and value creation component look somewhat different in the public sector in that public organizations are mainly concerned about value creation for the citizens, not for profit-maximizing organizations. And, the novelty is more often related to improvements of services or novel policies or modes of interacting with the public (Bloch & Bugge 2013). Walker (2006) argued that the distinction between types of innovation contribute to increase the understanding of organizations’ innovative behavior. This is because innovations have different characteristics and the adoption of innovations are not determined by organizational culture (Walker, 2006). De Vries et al. (2016) identified four main categories of innovation; process innovation, product or service innovation, governance innovation and conceptual innovation. Innovations can include elements from two or more categories. One being a delivery element which is new or changed ways of delivering services or solving tasks. Others can include an administrative element where new or different ways in organizing activities is implemented, a system interaction element which is new or improved ways of collaboration, or a conceptual
element with new world views, rationalities, and missions and strategies (Cunningham, 2005; De Vries et al., 2016).

Some organizations are compatible with one type of innovation but not others. Research has revealed that innovation, especially radical and disruptive ones, are challenging for public organizations (OECD, 2017). Innovation in the public sector must be fitted into a complex web of organizational structures and achieve multiple performance targets, often decided and implemented as top-down policy (Halvorsen, Hauknes, Miles & Røste, 2005). Even though new modes of innovation emphasize that innovation is an interactive process where organizations interact with users and suppliers, knowledge and institutions, there are still a bias in the literature relating to the acceptance of innovation as a formal research and development process (Jensen et al., 2007). Following the Oslo Manual, innovation activities are centered around R&D-activities (Bloch, 2011). Within the limits set by ruling belief systems and existing policies in the public sector, much innovation is centered around non-technical activities. Innovation is often a result of problem-solving, generating vitally important incremental changes, making R&D activities less central (Albury, 2005; Koch & Hauknes, 2005). “Hidden innovation often represents the innovation that matters – the innovation that most directly contributes to the real practice and performance of a sector” (NESTA, 2007. p. 4). These include minor changes and adaptions to existing services forwarded by public professionals with the desire to improve performance and the lives of citizens. An example of an important organizational change in the Norwegian public sector is the development of Altinn, where the contact between the government and individuals was digitized. This was a radical innovation all over but was been implemented bit by bit over the last decades.

Over the years there has been a reformulation of the nature of innovation in the public sector (Osborne & Brown, 2011). The core element of novelty in innovation greatly separates the concept from common organizational changes. This is however to some degree contradictory to how innovation is portrayed in policy frameworks or what innovation actually entails within the public sector (Osborne & Brown, 2011). Given that the public sector is characterized by incremental innovations, where a large part constitutes improvements of existing services, the reconceptualization of innovation portrays the innovation process not as a process of organizational and service discontinuity and change, but rather as one of the continuous improvements in service delivery (Osborne & Brown, 2011).
3.3.1 Characteristics of the public sector

There is a common, though mistaken, assumption that private sector are better innovators than public sector, and that it is beneficial for the public sector to adopt strategies and practices from the private sector (Bloch & Bugge, 2013; Mazzucato, 2015; Osborne & Brown, 2013). Activities by the public sector has generally been seen as regulatory frameworks for innovation activities or as recipients and users of innovation generated in the private sector (Bloch, 2011; Windrum, 2008). However, the public sector activities are about more than this. There is no clear definition of what the public sector entails, but the majority of people seem to have a common notion of what the public sector involves. The public responsibility and provision of goods and services differs from nation to nation. In Norway, the public sector is relatively large, the expenditure on the public sector as percentage of GDP exceeds 50 percent (Statistics Norway, 2018). Maroto and Rubalcaba (2005, p. 4) provide a functional definition of the public sector: “the public sector includes all organizations in the field of the public administration, social security, law and order, education, health care, and social and cultural services, irrespective of their funding source and the legal form of the supplier”. Public sector organizations are key actors for delivering a high level of public services to citizens and businesses, as well as being important for social-economic development and the achievement of the objectives put forward by policies (Bloch, 2011; Koch & Hauknes, 2005). Koch and Hauknes (2005, p. 4) state that it is a paradox that the socio-economic innovation literature has neglected the public sector. Because of the “less innovative” assumption and the domination of innovation literature favoring the private sector, it has become natural to compare private and public sector in terms of their innovativeness (Van Tunzelmann & Acha, 2005). However, the vast amount of differences between the sectors makes it problematic to make a realistic comparison between the two.

Some of the key differences between the two sectors regard the environment they operate in, value creation, fear of failure and traditional characteristics (Bloch & Bugge, 2013; Koch & Hauknes, 2005). Perhaps the most prominent difference is that public sector organizations does not always operate in competitive markets and hence are not driven by the profit-maximizing incentive to innovate (Bloch & Bugge, 2013; Miles & Røste, 2005). Public sector innovation is too complex to fit a model where innovation strategies are shaped by the search for maximal profits (Koch & Hauknes, 2005). For many services, there exists no other options the users can
replace the public provider with, e.g. the majority of social services in Norway. Because public sector organizations lack the market incentives to innovate, there are other objectives that drives the public sector to innovate. Public organizations are to a great extent owned and operated by the state, and so the organizing principles is based on an enactment of public policies. The organizations are characterized by the fact that they are continuously shaped by public policy, and that rules and regulations strongly influence decision making (Bloch, 2011; Cunningham, 2005). It is often new and changing policies that address highly complex problems that require innovations, not an increase in market competition (Halvorsen et al., 2005). Judging what success entails in the public sector are not straight-forward. In businesses the success is measured by increase in profit or growth. In public sector there are primarily three forms of value creation; services, social outcomes and trust (Kelly, Mulgan & Muers, 2002). These are both complex and multifaceted because innovation can have both positive and negative outcomes (Bloch & Bugge, 2013). For example, for the implementation of GPS-tracking for patients with dementia some will consider it a positive output because it can increase the freedom of the patient, while others may describe it as a negative output because it can act as a deprivation of the patient’s freedom.

Risk aversion or the fear of failure is another prominent difference and has been assumed to act as a barrier to innovation in the public sector. While private organizations must take risk in order to survive in the market, public organizations have less an incentive for taking risks and more to lose if taking risks (Bloch & Bugge, 2013). Generating public value through innovation is challenging for governments (OECD, 2017). The public sector has a statutory duty, democratic responsibility and political mandate to deliver public services in consistent and equal ways, which complicates investing in risky and unknown innovation projects (OECD, 2017). At the same time, government also has a pressure to provide public services in the most effective way possible (OECD, 2017). Unsuccessful innovations can cause a media debate and backlash from the opposition parties (Borins, 2001). In order to ensure that public sector activities address their societal objectives in addition to its organizational goals, it is important that the public sector framework make this possible (Bloch & Bugge, 2013). For example, the funding schemes for hospitals imply differentiated payment for various illnesses, making the hospitals prioritize the most economically rewarding diseases, which may affect diagnosing and treatment. The public sector is under constant surveillance from the media and opposition parties, which can increase the fear of failure (Borins, 2001). Healthcare is for example a major political issue and shortcomings of governmental health policies often form big debates (Koch
& Hauknes, 2005). A consequence of this is that politicians and public service managers are cautious of enacting changes that could result in negative outcomes (Koch & Hauknes, 2005).

The conventional characteristics of the public sector is another element that commonly has differentiated the two sectors. Public organizations on the one hand, are traditionally conceptualized as mechanical organizations and characterized by a rigid and hierarchical structure which are adapted to stable and predictable environments (Burns & Stalker, 1961; Mintzberg, 1979). While, private organizations on the other hand, are traditionally associated as more organic organizations, characterized by a dynamic and flat structure adapted to an unstable and unpredictable environment (Burns & Stalker, 1961). It is from these categorizations the assumption of the public sector as “less innovative” has emerged. However, these categorizations have become less distinct over the years. The underlying bureaucratic values such as stability, efficiency, effectiveness, accountability and transparency, are in nature not contradictory to innovation (OECD, 2017). Some tensions do arise, between the nature of public organizations and the attitudes underlying innovation, much to do with the wider culture influenced by “silos”, hierarchical structures and risk aversion (OECD, 2017). A hierarchical structure entails an obedience to higher levels of authority which might inhibit bottom-up innovation. The control function of hierarchy can discourage ideas from front-line employees and thereby prevent the knowledge acquired at the bottom from reaching the top and generate learning opportunities (Sørensen & Torfing, 2012). The public sector is comprised of a large system of organizations with complex structures. This impact, both directly and indirectly, how public organizations operate and innovate (Bloch, 2011). When organizations are divided into larger number of subunits, problems of coordination and control often arise (Kimberly & Evanisko, 1981).

3.3.2 Fostering innovation in public organizations

Bloch and Bugge (2013) stated that the most common objectives for innovation activities in the Nordic countries are (1) increased efficiency, (2) improved goods and services, and (3) improve user satisfaction. In addition to these objectives, innovation is needed to cope with periods where there is downward cost pressure, rising the need to work “smarter”, not harder (Albury, 2005, p. 51). With higher customer expectations and a diversified society, a “one size fits all” policy for service development are not compatible. Public managers must
institutionalize innovation in their organizations by setting up structurers, processes and building the capacity that embed innovation as a core activity (Bason, 2018).

A framework presented by Albury (2005) suggest an approach to make innovation a core activity of public sector development. The framework includes five components; the generation of possibilities, the trailing and prototyping of promising ideas, replication and scaling up, and analysis and learning. The organizational culture affects all these approaches and are therefore a key starting point for building innovation capacity (OECD, 2017). A condition for generating possibilities are the initiation of ideas. Staff and professionals at all levels in public organizations can be a rich source of ideas for incremental and radical improvements, and typically stands for the majority of initiated innovations (Borins, 2001). The innovation process can be initiated top-down or bottom-up. Top-down innovations are initiated by the management or organizations or institutions higher up in the hierarchy, where bottom-up innovations are initiated by employees “on the floor” (Koch & Hauknes, 2005). The capacity for bottom-up innovativeness follows with a prerequisite that the management create and support a creative culture of innovation that permit employees to engage in activities associated with risks that often follows the innovation (Osborne & Brown, 2011). Many innovations also arise from inspiration and “learning from others” (Albury, 2005, p. 53).

The successfully generation of innovations further require leadership which provide a clear direction and goals, fostering a culture of creativity and diversity (Albury, 2005). The selection of which ideas to further develop is a critical issue. As mentioned earlier, innovation in the public sector carries larger risks compared to the private sector due to the public scrutiny and the responsibility to uphold the quality of life for the citizens (Albury, 2005). Scaling up in the public sector has often consisted of publicizing examples of best practice through conferences or websites (Albury, 2005). The establishment of networks and collaborations have been introduced as measures to encourage the diffusion of innovation across the sector. Public organizations can develop innovation units that facilitate the interdisciplinary nature of innovation projects and reduces the tension between continuing business as usual while introducing new approaches (OECD, 2017). An example of this relevant for this study is the Innovation Department at Oslo University Hospital.

Although learning is not the end-point, it is a crucial element in the cyclical process of innovation (Albury, 2005). Evaluation is an important element in generating learning, both in
observing what worked and what did not, and the reason for this. By using performance management and evidence to promote the widespread adoption of innovative approaches, the budgetary and political objectives will be linked. Innovation is systemic in its nature and does often lead to unpredictable consequences. In some organizations there are people who will not admit they have made mistakes, while in other organizations mistakes will be considered opportunities for improvement (Bessant & Caffyn, 1997). The use of performance measures can help increase learning opportunities. It is important for organizations to also treat the ‘failed’ innovations as a learning opportunity and knowledge development (Albury, 2005).

Government organizations, such as the Department of Health and Care service, and individual organizations, such as Oslo University Hospital, have different performance measures and incentives to innovate. One can therefore assume that there are different factors affecting innovativeness within the public sector.

3.4 Innovation in the public health care system

The health care sector is characterized by being a highly political and complex organizational sector with powerful professional groups and regulatory systems (Radnor, Holweg & Waring, 2012). Health and social services are a common public responsibility in all European countries and the sector is one of the largest service providers of the Norwegian public sector (Koch & Hauknes, 2005; SSB, 2018). Hospitals stand for a large part of this service provision and are one of the most complex organizations in our society. Hospitals are often comprised of several departments characterized by a highly autonomous and knowledgeable operative core with different specializations (Mintzberg, 1993). They provide medical, surgical and psychiatric care and treats sick or injured patients (Lee & Hong, 2014; Ugurluoglu et al., 2012). Hospitals work with a vast amount of information and they need highly skilled employees and access to knowledge to be able to make sound decisions in a complicated decision-making environment. However, as stated earlier, the literature on the innovativeness of the public sector has been scarce (Bommert, 2010; Hartley, 2005; Mulgan & Albury, 2003). This especially counts for literature on the innovativeness of hospitals. Although, as Salge and Vera put it; “the association of the word innovation and hospital does not seem absurd” (2009, p. 55).

Because of the large division of labor and the collaborative approach to the use of knowledge, hospitals, especially university hospitals, are central actors in what is conceptualized as
distributed health innovation systems (Thune & Mina, 2016). Hospitals have close ties to their users, and a range of activities performed by hospitals are related to learning and adaption in the user context. Not only do they provide health and care services, they are developers, adopters and users of new technology and services. In addition, hospitals are key players for the adoption, reproduction and generation of medical knowledge (Thune & Mina, 2016).

In the context of hospitals, innovations are often referred to as novel products (medical equipment), new services (patient hotel, clinical procedure), new processes (patient pathways), or a new organizational structure (Salge & Vera, 2009). Ugurluoglu et al. (2012, p. 162) conceptualize healthcare innovation as the introduction of a new concept, idea, service, process or product with the purpose of improving treatment, diagnosis, education and research. They also have a long-term goal of improving quality, safety, outcomes, efficiency and costs. The majority of the literature concerning innovation in hospitals, consider it in context of medical innovations, such as new treatments or medical devices (e.g. Consoli, Mina, Nelson & Ramlogan, 2016; Morlacchi & Nelson, 2011). The innovation process is considered a recursive long-term problem-solving process, where interaction between actors and competences among invention, development, diffusion and use of new technology is important (Djellal & Gallouj, 2005; Galbrun & Kijima, 2009, 2010; Metcalfe et al., 2005; Morlacchi & Nelson, 2011). An assumption is that innovation processes concerning i.e. organizational innovations, might look somewhat different than for the development of medical innovations. A possible similarity is however that the innovations emerge from medical practice, where practitioners are involved in incremental and problem-driven improvement processes with the purpose of improving conditions for patients (Thune & Mina, 2016).

In conjunction with the discussion of the role innovation has in the health care system, one can point to several factors affecting the innovativeness of health care organizations generally, and hospital particularly.
3.4.1 Barriers and drivers

Public health systems studied by Cunningham (2005) appeared to share several common features which could act in a way to hinder or prevent the process of innovation. Although there have been identified a number of categories, they are rarely mutually exclusive. One barrier may be the cause or effect of one or several others in a complex interplay.

The public health sector comprises of complex and large-scale organizations, composed of multiple interlinked systems (Cunningham, 2005). These organizations, like hospitals, often have a large staff, a large range of professional, semi-professional and ancillary occupations and also diversity in service processes (Kimberly & Evanisko, 1981; Koch & Hauknes, 2005). The size and complexity can hinder the process of innovation. Common barriers are lack of clear agreement with respect to perceived problems, approaches and solutions, localized skills shortages, and clear channels of communication and collaboration (Cunningham, 2005). Health care organizations are prone to develop “silo mentalities” wherein parallel systems maintain their own organizational norms, beliefs and practices with little communication with each other (Cunningham, 2005). When organizations fail to collaborate it often inhibit innovative solutions. The silo-systems therefore acts as a prominent barrier to innovation (OECD, 2017). Silo-mentalities are often restrained to their own practices and procedures, that are viewed as good practice because it has worked in the past.

The high degree of heritage and legacy within health care organizations result in an attitude of: “if it isn’t broke, don’t fix it” (Cunningham, 2005, p. 40). This will have an impact on innovation in which new ideas will be discouraged and unwelcomed. Public health systems comprise of different and well-established professional groupings, each with their own communities of practice, rationales and perspectives (Koch & Hauknes, 2005). The actors involved in the health-care systems have different, yet related, responsibilities. Many of the tasks they perform are dependent on the contribution of other actors. The mutual dependency that emerge between the actors construct the systemic quality of health innovations (Windrum & Garcia-Goñi, 2008). Lack of communication between the different groups in the healthcare system, horizontally or vertically, may hinder innovation and its dissemination (Cunningham, 2005). Different medical professions might be unwilling to accept the ideas of others, even though they experience the same problem at hand. Some are also reluctant to lose medical autonomy, while others may be reluctant to engage with external stakeholders (Cunningham,
This reluctance can create trust issues and hinder collaboration, as well as create strong demarcations between supporters for innovation and those resistance to it (Cunningham, 2005; Strand, 2007).

As with other public organizations, risk aversion is also a common barrier in health organizations (Bloch & Bugge, 2013). Innovation implies novelty where knowledge about the outcomes are limited. Implementing changes that may result in an increased probability of risk for patients are therefore often resisted. Innovations are rarely isolated and depends upon further changes leading to a ripple-effect across the organization they are applied in (Cunningham, 2005). An improvement in one part of the organization just shift the problem over to another part. Due to the complexity of the organizations and problems at hand, there may be a lack of structures and mechanisms for the development of organizational learning (Cunningham, 2005). The lack of dialogue between the actors in a complex organization, and the lack of experience with change management will hinder the diffusion of good practices developed in one part of the organization to the rest.

As previously mentioned, the objectives to innovate in public organizations are not always aimed at economic efficiency. The desire to improve the overall quality of the delivery of health care often entail the need to expand additional resources. However, the access to resources regarding financial support, skills and support services may be limited (Koch & Hauknes, 2005). With the exception of R&D-funding, the lack of resources for the support of innovation is often perceived as a barrier. An assumption related to this barrier, is that incremental innovations are not considered as innovation when it comes to funding and granting of resources. Funding are primarily related to R&D-activities and scientific research projects. This will make it difficult for organizations to invest in incremental innovation activities, where perhaps funding is needed for conducting workshops or implementing idea suggestion systems.

Many of the barriers can also act as drivers and facilitators for innovation in the public health sector, e.g. pressures for innovation (Cunningham, 2005). For instance, political pressure might lead to the allocation of more resources and beneficial changes in health organizations. Most innovations are introduced in response to new specific problems. Some common underlying problems are demographical changes, ageing population and the need to streamline the delivery of care. Solving these problems will require innovation, and thus act as a driver. Innovations can also be introduced as an improvement on the former situation (Cunningham, 2005).
Because of the demanding, uncertain and time-critical context hospitals find themselves in, it is important to exploit existing knowledge and capabilities to meet operational needs and generate innovation (Schultz, Zippel-Schultz & Salomo, 2012). Delivering services more efficiently may not be a specific problem, but it is an overall goal of the majority of organizations.

The growth of support functions for innovation is another driver. Support functions include both the allocation of resources and the provision of structures and systems designed to promote, stimulate or disseminate innovation (Cunningham, 2005; Jensen et al., 2007). Such structures and systems are staff suggestions boxes, competence building, and staff fora. These can be initiated both from the management top-down or from the staff bottom-up. Public health sector employees are characterized by their high levels of professional expertise and competences of creativity and problem-solving (Koch & Hauknes, 2005). Innovation processes and the implementation and diffusion of innovations are often driven forward by “innovation champions” (Cunningham, 2005). Health professionals have a common desire to improve the conditions and the well-being of patients, which may include the search for new solutions and approaches (Thune & Mina, 2016). The use of performance targets or indicators can encourage the generation of ideas and suggestions for new approaches in order to increase performance ratings. Performance measures can have many forms. A common measure is a hospital’s patient survival rate, but the desire to improve patients’ treatment experience is another common goal to pursue. However, such performance measure can also result in unintended consequences such as deviant behavior (Cunningham, 2005). In this case, medical staff can experience deprivation of the human aspect of medical care, which will not show in numbers and statistics.

Innovation activities at hospitals are influenced by organizational factors such as structure, culture, and support. At the same time, individual factors such as motivation, behavior and opinions also influence the innovative capacity of hospitals (Garcia-Goñi et al., 2007; Lee & Hong, 2014; Thune, 2015). Hospitals have typically been considered as adopters rather than generators of innovations (Thune & Mina, 2016). Most of the innovation effort in hospitals is underestimated or even, in some cases, entirely unrecognized (Salge, 2012). For a long time, it has been presumed that scientific research has been the key to advances in medical treatment, and the role of learning in practice has been neglected (Morlacchi & Nelson, 2011). The scientific activities leading to medical innovations often conducted in hospital’s R&D-labs are
only one piece of the puzzle of hospitals’ innovativeness. Innovations are also largely developed in other hospital functions through problem-solving in daily practices. These innovations make up the rest of the puzzle but are often remained hidden behind hospital walls (Salge & Vera, 2009). Djellal and Gallouj (2005, p. 822) point to the fact that the literature on innovation in hospitals suffer from a twofold inadequacy. For the most part, the literature has a focus on science- and technology in relation to innovation. Innovations in health-care activities, e.g. diagnostics and treatment, are also favored. If one seeks to fully understand innovation in hospitals, it is necessary to break into the black box of the organization.

### 3.4.2 Innovative activities at hospitals

There are several units and actors involved in innovative activities at a hospital. Developing new knowledge and ideas for new products and services emerges from interaction between different units. The development often involves incremental changes in technology and improvements in existing processes through learning by doing. Galbrun and Kijima (2010) claim that the role of hospitals and clinicians should not be understood only in terms of their role in scientific examinations, testing new products or implementing products and services. The experimental function performed in clinical settings makes hospitals a key arena for interaction between science-based knowledge, technology and clinical practice, in addition to generate, select and disseminate innovations (Galbrun & Kijima, 2010).

Hospital staff or innovative practitioners have a central role in generating innovations in medicine and health care (Garcia-Goñi et al., 2007). Previous research studying barriers experienced by hospital staff working on science-based innovation reveals that hospital staff show reluctance to work with innovation, and that there is a lack of time and resources to work with developing new ideas (Thune, 2015). However, staff that works more with innovation experience less barriers than those working less with innovation. Hospital employees with research as their main tasks reports to work frequently with innovation (Thune, 2015). Medical doctors are proven to play an especially important role in generating innovations (Garcia-Goñi et al., 2007). Doctors in clinical settings often find out that existing products and processes do not solve the problems that arise. In these settings they come up with ideas for new solutions, and for this reason they are considered to be inventors. Research conducted by Garcia-Goñi et al. (2007) studied the motivation of managers and frontline personnel in health care organizations for engaging in innovation activities. The existence of differences in the attitude
towards innovation between the health professionals are explored. The article considers the motivation of the actors to be connected to improved service provision and compares different degrees of participation and motivation among different groups of staff. Findings in the article suggest that managers are significantly more motivated and more involved in innovation activities than frontline staff.

### 3.4.3 Different modes of innovation in hospitals

There is a crucial importance to understand how hospitals can foster or hinder innovation, both in terms of how organizational characteristics and practices influence innovativeness (Hernandez, et al., 2013; Lee & Hong, 2014). The work by Salge and Vera (2009) draw upon the distinction between science, technology and innovation, and doing, using and interacting as modes of learning introduced by Jensen et al. (2007) in their study of the relationship between innovativeness and performance at hospitals. Their study identifies two related modes of hospital innovativeness: science-based and practice-based. In a hospital setting, science-based innovativeness is often related to technical and clinical innovations generated by specialized research groups, while practice-based innovativeness is driven forward by informal problem-solving embedded in daily work activities and thrives on tacit and local knowledge (Salge & Vera, 2009). Due to its lack of formality, it is hard to separate practice-based innovation from everyday work practices. The wealth of everyday innovations—generated by medical, nursing and managerial staff—often hardly makes it to the surface of public and scholarly attention (Djellal & Gallouj, 2005). Indicators of the DUI-mode of innovation proposed by Jensen et al. (2007) are based on a list of organizational practices and design features. Salge and Vera (2009) redesigned these indicators into three statements: (1) my trust encourages us to report errors or mistakes, (2) managers encourage staff to suggest new ideas for improving services, (3) I am involved in deciding on the changes introduces that affect my work area/team/department. The indicators used for science-based are the amount of external research funding, ongoing R&D projects, and peer-reviewed journal publications. Results show that investments in both science-based and practice-based innovation are beneficial for hospital performance. Practice-based innovativeness show to have a positive relationship in the case of service quality ranking and on return on income and resources per bed. Science-based innovativeness shows stronger positive associations in terms of mortality and patient satisfaction (Salge & Vera, 2009).
Given the emphasis this study has on incremental innovation and learning, the concept of incremental learning capabilities will be elaborated. Incremental learning will often take the form of learning by doing in problem-solving in daily work activities. Incremental learning capabilities can be conceptualized as a bundle of learned and stable routines which enable the organization to gradually adapt and expand its knowledge base and tends to be experimental and cumulative in nature (Jensen et al., 2007; Salge & Vera, 2013).

Salge and Vera (2013) identified three constitutive routines of incremental learning capabilities, which they label “detecting problems”, “suggesting ideas” and “participating in change”. The first routine consists of observing, recognizing and reporting problems and errors that occur as part of daily work activities (Salge & Vera, 2013). Problem detection is by itself not enough to lead to organizational learning. Suggesting ideas is necessary and constitutes the second routine of incremental learning. This routine represents the engine of all evolutionary processes and the key to solve the problems at hand (Nelson & Winter, 1982). Such ideas are best developed by those closest to the problem. Suggesting ideas includes recognizing improvement possibilities often based on personal experience, but also interpreting and sharing these insights or ideas (Salge & Vera, 2013). A safe environment where the staff is encouraged to speak up is an important part for generating idea suggestion. For the emergence of incremental learning, ideas must be embedded in work activities. The third routine are therefore the implementation of new ideas (Salge & Vera, 2013). Research show that organizational climate that support staff initiatives and participatory decision-making is likely to positively affect the organizational ability to learn and innovative performance (Dias & Escoval, 2013). Communication and collaboration between actors across the organization are essential for the development of a shared understanding and to embed learning into organizational systems, structures and procedures.

Engagement in incremental learning is likely to improve both specific operating routines and incremental learning routines (Salge & Vera, 2013). Organizations will have to invest in developing a suitable organizational infrastructure and create a supportive organizational climate if they seek to build and maintain effective incremental learning capabilities (Salge & Vera, 2013). Although incremental changes might come in small steps, the sum will have a large impact. Table 2 shows an overview of the different indicators for DUI-mode of innovation and learning formed in literature.
University Hospitals tend to be associated with higher levels of STI-based search and incremental learning routines are shown to receive surprisingly little managerial and political attention (Salge & Vera, 2013; Jensen et al., 2007). For these routines to flourish, managers need to encourage reporting and open discussion of errors, incidents and other problems. At the same time, they must also value and act upon the ideas submitted by all staff members and involve the latter in key decisions that affect their work (Salge & Vera, 2013).

### 3.5 Research questions

Future societal challenges are predicted to affect the way health care are formulated, delivered and assessed (Cunningham, 2005). Issues of demographics and increase in long-term conditions and longevity will force hospitals to change current organizations, structures and the way care is provided. How hospitals should organize to meet these challenges are still unclear. Nevertheless, hospitals have begun to enforce changes and reorganize as a way to prepare for the coming challenges. The uncertainty of how hospitals best should organize cancer treatment in the future spurred an interest to investigate a possible solution. The overarching research question of this thesis are therefore: “how can hospitals best organize cancer treatment to deal with future societal challenges?”.

To contribute with insights to this question, three specific research questions have been constructed. These questions were based on theoretical terms and concepts within the context of innovation in the public sector and hospitals presented in this chapter. In addition, theories on innovation and learning shape the framework of the questions. Innovation will in this study be analyzed on the basis of two ideal modes of innovation; science-, technology-, and

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<td>Problem reporting</td>
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<td>Quality circles</td>
<td>“Managers encourage staff to suggest new ideas for improving services”</td>
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<td>“I am involved in deciding on the changes introduced that affect my work area/team/department”</td>
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Table 2: Indicators of DUI- mode of innovation and learning (Jensen et al., 2007; Salge & Vera, 2009, 2013).
innovation mode of innovation and doing-, using-, and interacting mode of innovation (Jensen et al., 2007).

Previous research has revealed that informal, disorganized daily practices of problem-solving may just as well add up to innovations over time as the indented, radical changes (Bloch & Bugge, 2013). This, however, require that the employees are encouraged to come up with ideas and are willing to learn. There is substantial evidence that incremental learning, such as learning by doing, using and interacting enhance organizational performance and innovativeness (Jensen et al., 2007; Salge & Vera, 2009, 2013; Dias & Escoval, 2013). These processes often go unrecognized for management or scholars and remain hidden because they are a part of regular work activities.

Literature on innovation in hospitals have to a large degree revolved around the role of medical innovations, both regarding how hospitals generate novel medical devices and treatment regimes, and how such innovation processes unfolds (Thune & Mina, 2016). The lack of studies examining how health care can be improved from an organizational point of view has motivated the point of interest in this study. Some studies have addressed the question of organizational characteristics and practices that can promote innovation at hospitals (Dias & Escoval, 2013; Garcia-Goñi et al., 2007; Hernandez et al., 2013; Lee & Hong, 2014; Ugurluoglu et al., 2013). However, few have investigated whether these features are beneficial for the generation of novelty or implementation of innovative solutions (Thune & Mina, 2016).

This study is concerned with an innovation process regarding the adaption of an organizational change, which can be viewed as an organizational innovation. The implementation of case pathways and continuous improvement of cancer patient pathways will serve as an example of a case where Oslo University Hospital organize cancer care processes differently. The phenomena of the case studied in this thesis represents an innovation initiated top-down by the government which was implemented at OUH and generated further development of an already existing process at a hospital.
The study tries to establish an understanding of how structural factors have affected the hospital staffs’ motivation and innovative behavior towards improving existing organizational practices, in addition to how the presence of DUI-activities have led to generation and implementation of novel solutions. The questions that will contribute to this understanding are the following:

RQ1: *How does the hospital organize innovation and improvement projects?*

RQ2: *How does Oslo University Hospital foster incremental learning?*

RQ3: *What are the perceived barriers of the implementation of case pathways and the improvement of cancer patient pathways?*

The analysis of the empirical findings in this study will be structured in the given order of the specific research questions. The chapter will end with a presentation of outcomes and changes the implementation of case pathways and improvement of cancer patient pathways have resulted in at Oslo University Hospital. This presentation will contribute to the discussion of the overarching research question of how hospitals best can organize cancer treatment in the future. Before the analysis, the methodological choices made in this study are presented.


4 Methodological approach

In this chapter the methodological approach for this study are presented. The first section will be an introduction of qualitative research, followed by a presentation of case studies highlighting the data collecting methods used: interviews and content analysis of documents. Further the sampling process will be explained, and lastly the ethical concerns related to qualitative research in general, and this project in particular will be discussed.

4.1 Qualitative research

When choosing the design of the research and which methods to conduct, the researcher has to be familiar with the differences between intensive and extensive research, more commonly known as qualitative and quantitative research (Bradshaw & Stratford, 2010). The aim of extensive research is identifying regularities, patterns and distinguishing features of a population. Intensive research on the other hand, are concerned about how social phenomena occurs. Qualitative research methods are designed to provide an in-depth and interpreted understanding of the social world and behavior of the actors involved by learning about their social structures, their individual experiences, perspectives and histories (Whinchester & Rofe, 2010). To gain this understanding, the researcher asks questions of “why” and “how” processes work in a particular case (Bradshaw & Stratford, 2010). The choice made to conduct a qualitative research project is based on the nature of the research questions. This project is intensive because it seeks to understand a social phenomenon and how processes work in a particular case. The aim is to understand organizational change and learning processes related to the implementation of case pathways and further development of cancer care pathways at Oslo University Hospital. Elements concerning learning are too complex to capture with survey-based methods (Jensen et al., 2007). It was of interest to collect subjective perceptions from the hospital staff. This argued for a qualitative approach.
4.2 Case study research

This thesis utilized a case study design, which is an intensive study of a single instance with the purpose of exploring in-depth nuances of a social phenomenon and the contextual influences on and explanations of that phenomenon (Baxter, 2010, p. 81). When asking explanatory questions of “how” and “why”, case study research is suitable to conduct. Questions of this nature need to be traced over a period of time by doing a case study, rather than examining an incidence by conducting a survey (Yin, 2009). The questions related to this study asks how Oslo University Hospital organize innovation and improvement projects, how Oslo University Hospital foster incremental learning, and how the hospital can organize cancer treatment in the future. In addition, one of the research questions ask: “what are the perceived barriers of the implementation of case pathways and the improvement of cancer patient pathways?”. This question was however argued to fit a case study approach due to the exploratory nature (Yin, 2009). The question seeks to capture personal opinions and meanings, and propositions for further investigation. Conducting a case study was therefore assumed to be appropriate for answering these research questions.

Case study is classified more as a methodology or approach rather than a method due to the important philosophical assumptions of the research that support the value of the case research (Baxter, 2010). The primary assumption is that in-depth understanding about one presentation of a phenomenon is valuable on its own without specific consideration to how the phenomenon is presented in cases that are not under study (Baxter, 2010). By providing this understanding about why theoretical concepts or explanations do or do not apply in a particular case, it can contribute to solve problems or confirm existing theory about the phenomenon. One of the unique strengths of case studies is the ability to combine a variety of evidence, such as interviews, observations and documents (Yin, 2012). It is this combination of evidence is what makes the approach valuable alone.

Despite the foothold case studies have as an empirical research strategy, there are biases within the research community towards the approach. The greatest concern is due to the lack of rigor (Yin, 2009). The absence of clear step-by-step guidelines for how to conduct a good case study have led to instances where the researcher has allowed for biased views to alter the findings and conclusions. It is difficult for a researcher to conduct good case studies, and equally difficult to test a researcher’s ability to do good studies (Yin, 2009). Therefore, the skills
needed for doing good case studies have not been formally defined. A second concern is about the generalizability of case studies. Although case studies are not generalizable to populations or universes, they can be applied to theoretical propositions, where the researcher is striving to generalize a particular set of results to a broader theory (Yin, 2009). A final concern about case studies is that they take a long time to conduct and results in loads of information. Yin (2009) argues that case studies often are confused with ethnography and participant-observation but can in fact be very different. Case studies does not have to take a long time, nor result in a bunch of fieldnotes. To make up for some of these concerns and biases, it is important with transparency and rigor throughout the process of conducting the study. More on rigor under section 3.5.

Yin (2009) presents three conditions a researcher has to consider when selecting a method to use. First, the method has to be chosen in relation to the research question. The second condition is the extent of behavioral control the researcher has, and the third is whether the focus is on a historical or current event. For a case study to be appropriate, the research should focus on current events, it should ask why or how-questions, and the researcher should be in no need to control the variables (Yin, 2009). When designing case studies, the researcher also must decide whether a single case study or multiple cases will be used to answer the research question (Yin, 2009). There are five major rationales for conducting a single case study. When the case represents (1) the critical case in testing an existing theory, when the case represents (2) an extreme or unique event, when the case serves (3) a revelatory purpose, when the case serves (4) a longitudinal purpose or when the case is (5) representative or common (Yin, 2009). When a single case study includes several subunits of analyzes it will lead to a more complex design and the subunits can enhance the insights and provide an extensive analysis (Yin, 2009).

As a starting point, this study fulfills all three criteria proposed by Yin (2009) for conducting a case study. The chosen case is (1) contemporary and unfolds parallelly with the writing of the thesis. The implementation of case pathways happened from 2014-2015 and led to a need to further develop cancer patient pathways. The process of developing and improving these pathways are an ongoing process at the hospital today. The study primarily asked (2) how-questions about these processes. Because the purpose of the study was to understand a social and contemporary event, there was therefore (3) no need to control any variables. The foundation of the study was based on gathering information about the subjects’ own experiences and views of a particular case in a natural setting. Controlling the variables would
therefore act as a barrier in this type of research (Yin, 2009). When it was clear that a case study was appropriate to utilize, the type of design had to be selected. This project is labeled as an embedded, single case study. The study was limited to a single organization, Oslo University Hospital, but included data collected from a group of employees, such as support functions and clinicians. Further, the chosen case was not a unique event, but somewhat an everyday phenomenon. When choosing a common case, the researcher must define some compelling theoretical framework for selecting the case (Yin, 2012). To the authors knowledge, there was a lack of studies linking cancer patient pathways to innovation and investigating an organizational innovation process with an emphasis on doing-, using-, and interacting learning in a Norwegian hospital context. It was argued that this combination of theory acted as a compelling theoretical framework.

4.2.1 Choice of case

Cases are instances of more general processes or structures that can be theorized (Bradshaw & Stratford, 2010). Selecting cases combines both purpose and serendipity. First, theoretical interests drive the research and narrows the field. Second, the case either finds the researcher or the researcher finds the case. Regardless of how the case is selected, the researcher can choose between typical cases or disconfirming cases. Typical cases provide useful insights to casual processes in other contexts, while disconfirming cases challenges the researcher’s interpretations and do not confirm ways in which other portray it (Bradshaw & Stratford, 2010). Such cases can highlight different perspectives of an issue and thus create a nuanced picture. This study is argued to be a typical case study, providing informative lessons about experiences of hospital staff at Oslo University Hospital (Yin, 2009).

The theoretical interest in this project concerned innovation at hospitals, more specifically how OUH foster incremental learning and the practice-based mode of innovation. The case of cancer patient pathways seemed suitable to highlight the theoretical purpose because it represents an innovation of an incremental sort and requires close interaction and problem-solving in order to work properly. In this instance, it was the case that found the researcher. The idea of this thesis was formed when the author was made aware of the work with case pathways at Oslo University Hospital. After reading more about the pathways and how complex the case was, it became more apparent that the case could fit into the innovation concept and thus be a suitable case for this study. Initially, it was only case pathways that was
the subject of matter. However, while conducting more research and concluding the first interview, it became clear that cancer patient pathways had to be included. The two pathways are closely intertwined, where one is followed by the other. The pathways were also referred to as the same.

The process of building the theoretical framework was an inductive process. Before the interviews were conducted, the theoretical viewpoint of this study was to consider how the DUI-mode of innovation was practiced at the hospital and how the implementation of case pathways had led to changes in interaction and collaboration at the hospital. During the data collection and discussions with informants, new and interesting aspects emerged. This resulted in a specification of some of the concepts and the final theoretical framework was constructed ongoing. Even though the initial theoretical starting point still is emphasized by the current state of the study, several other aspects have also been included. The decision to include a discussion of the relationship between Lean and innovation is an example of one of the new aspects included. The reason for this came about when it became clear that it would be impossible to discuss the improvement processes of pathways without emphasizing this relationship because Lean was so greatly embedded in the work activities of the informants.

### 4.2.2 Background for the chosen angle

Accessing a desired field of study and relevant information can be time-consuming and difficult (Thagaard, 2009). The informants wanted for this study were not accessible for the researcher alone. One reason for this is that the hospital has closed records of their staff and the information about the employees are confidential. It was therefore not possible to search for clinicians involved in cancer treatment or pathways on the internet or through other channels. Another reason was that the complexity of the hospital acted as an obstacle. Being unfamiliar with the hospital and the organization of pathways made the process of trying to find possible participants overwhelming. It was therefore necessary to find another way into the desired field.

When researching for more information about pathways, one name kept coming up. Some more research was conducted of him and it turned out he was writing a ph.d. about care pathways and was a member of the Comprehensive Cancer Centre Board at Oslo University Hospital. On the basis of this, he was considered a good source of information. In October 2018 a meeting
was arranged. The purpose of the meeting was to have an informal discussion about care pathways. The meeting resulted however with him proposing a collaboration with OUH. He was interested in the topic and thought the results of the study could be of use to the hospital. When the focus of the study was narrowed down and a specific project description was delivered, he made suggestions for and reached out to relevant informants. Due to the confidentiality of the information at the hospital, he had to make the initial contact. The scheduling of interviews was further handled by the researcher. He acted as a gatekeeper during the project, providing access to the case, informants and other resources needed to carry out the project (Hammersley & Atkinson, 2007). The reason for the absence of anonymization was a decision made by the gatekeeper himself. He wished not to be anonymous.

### 4.3 Data collection

As mentioned above, a fundamental strength of the case study approach is the combination of several methods used to collect data. For the purpose of this thesis, interviews were chosen as the main data source, and content analysis of relevant documents as a supplementary data source. By reviewing documents in addition to interviewing informants, the information obtained was more reliable and truthful. Due to the complexity of the case, it was important to acquire a good understanding of cancer patient pathways and the organization Oslo University Hospital before any interviews were conducted. Several documents and articles about care pathways in general, and some about specific care pathways were read. Before the data collection started, two meetings were held at OUH, where the questions for the interviews and the chosen informants were discussed. This gave a better understanding of the case which was an important fundament to have before entering the interviews.

#### 4.3.1 Sampling a case study

Who the researcher choose as informants for the case study can impact the information collected, and thus the findings of the study (Dunn, 2016). Finding relevant participants is a difficult task. The researcher must find participants relevant to the case to make sure the data material is relevant and rigorous and contribute to answer the research question. The more focalized research interest and the better background information conducted, the more certain the researcher is on who to involve in the research and why (Bradshaw & Stratford, 2010).
Patton (2002) refers to seven strategies of purposive sampling. A researcher can use one strategy alone or combine strategies. This thesis applied two sampling strategies. One of the strategies used was snowball sampling, which is an approach for locating and identifying cases of interest and key informants. The process of collecting informants starts by asking people involved in similar cases if they know anyone who knows a lot about the particular case and could be a potential informant (Patton, 2002). Another sampling strategy used in this thesis are criterion sampling. This type of sampling involves reviewing cases that meet some predetermined criteria of importance, and selecting informants based on their participation in the selected cases (Patton, 2002). As Patton (2002) argues, there are no rules in qualitative inquiry related to sample size. Sample size depends on what is needed of knowledge, on the purpose of the inquiry, what will be useful and for whom, and on logistics and resources.

The predetermined criteria in this study was that the informants had to be employed by Oslo University Hospital and have experience with cancer patient pathways. A second criteria was that the participants were to hold different positions, and that some of the participants were involved in different pathways. The snowball method was chosen as the method for conducting participants because of the confidential information, making it difficult for an outsider to locate specific informants. It was crucial to get in touch with the gatekeeper who knew the research field and the employees at the hospital. At first, two different cancer patient pathways were chosen to use as reference groups. The pathways were chosen because they were less complex when comparing to others, and that it had a limited number of units and departments involved. When the pathways were decided, the gatekeeper came up with a list of participants as suggestions for whom to contact. Participants he knew were involved in developing cancer patient pathways were reached out to. The participants chosen had different positions at Oslo University Hospital, making the sampling diverse. The snowball method continued when two of the initial participants, involved in the particular care pathways picked out for this thesis, were asked to suggest two other participants involved in the respective cancer patient pathways. The suggested informants were contacted, but none had the time to participate. Additional clinicians were therefore reached out to, making the sampling consist of clinicians from several pathways. In addition to the informants from the hospital, one meeting was conducted with a consultant who had a lot of experience from implementing changes at hospitals. This meeting was not conducted as a formal interview, but rather as an informal conversation for experience sharing. The total sample size in this study consisted of twelve informants. These included six clinicians, five employees from support functions who had been significantly involved in
developing cancer patient pathways at Oslo University Hospital, and one expert interview from a consultancy. See table in appendix for an overview of the informants.

Given the collaboration with OUH and the help of the gatekeeper, the informants of this study hold central positions and are some of the most experienced with working on the implementation and improvement of patient pathways.

4.3.2 Qualitative interviews

Interviews is defined as a conversation with a purpose of gathering information (Patton, 2002, p.341). The research is based on information gathered from participants who talk about personal relationships, experiences and interpretations. Interviews are a valuable method of data collection because of its ability to fill knowledge gaps other methods are unable to fill (Dunn, 2010). Feelings, thoughts, motivations, experiences, and opinions cannot be observed. By conducting in depth interviews information about all these unobservable perspectives towards a given phenomenon will be gathered (Kvale & Brinkmann, 2015; Patton, 2002).

Interview was a preferred method in the current study because the purpose of the research was to collect a diversity of meanings, opinions and experiences. Several interviews with both managers and clinicians were conducted. The informants had variated experiences and opinions related to the topic, forming a nuanced picture of the case.

There are several approaches to gather data using qualitative interviews. The most common distinction to make is between structured interviews, semi-structured interviews and unstructured interviews (Dunn, 2010). One can either employ one of these structures or combine them. Here, semi-structured interviews were used. Semi-structured interviews, or the general interview guide approach, involves outlining a set of issues the researcher wants to discuss with each informant before the interviews. A major strength of semi-structured interviews is that it has some degree of a predetermined order while at the same time maintaining flexibility in the way issues are addressed by the informant (Dunn, 2010; Patton, 2002). Having an outline with specific issues beforehand increases the comprehensiveness of the data. This gives the data collection for each informant slightly a systematic nature (Patton, 2002). The flexible structure of the interview guide makes it possible to form and ask different follow-up questions and highlight different issues during the interview. This makes the interviews conversational and situational in contrast to structural interviews that may constrain
and limit the naturalness of the answers (Patton, 2002). In addition, it gives the opportunity to
adapt, explore and ask new questions if the informants touch upon interesting subjects. In this
study, two interview guides were constructed; one for clinicians and one for the employees
from the support functions. This was because of the different positions and the involvement in
pathways. Some of the questions were identical, while others were adjusted. The clinicians
working closely with the pathways were asked more specific questions about how pathways
affected their daily work routines, while the ones from support functions were asked more
general questions about how it had affected the hospital and how the hospital works with
developing the pathways.

The outline can though also function as a weakness. By having a predetermined outline of
issues, the researcher bares the risk of unintentionally overlook or neglect important topics that
arise during the interview. Although the flexibility of semi-structured interviews is a great
strength, it can at the same time result in significantly variations. The interviewer can sequence
and word the questions differently for each informant which can lead to different responses
and thereby reduce the comparability of responses (Patton, 2002).

**Conducting the interviews**

An interviewer’s job is to make sure the information necessary to answer the research question
is gathered. The quality of the information obtained during the interview will depend on the
quality of the interviewer (Patton, 2002). It can be beneficial to conduct pilot interviews before
interviews with informants. Pilot interviews can reveal inadequacies in the design, the
interviewer will get a better sense of how the interview guide and outline works, and if the
questions are articulated clearly (Yin, 2011). The interviewer gets to practice the role and
become comfortable. Conducting pilot interviews thus strengthens the reliability of the study
and increases the chance of conducting a good interview. Pilot interviews with two participants
were conducted in this study. One had knowledge about the research field, the other did not
know the field at all. These interviews were useful and contributed to specify the questions and
structure the guide in a natural order. It also helped increase confidence before the formal
interviews.

All interviews were conducted face-to-face at the participants’ office. In some cases, this was
somewhat time-consuming, due to the location of some of the hospitals. Oslo University
Hospital comprise of four different hospitals. The participants were located across three of the
hospitals. When conducting the interviews in their natural work element, one can observe different interactions, the work environment and witness the complexity of the hospital. It also made the informants more open to participate and it was easier for them to set aside time for the interviews. Also, face-to-face interviews were preferred over Skype or the phone. Through face-to-face interviews you are able to establish a rapport between the interviewee and the yourself. Achieving and maintaining rapport is critical for the collection of opinions and insights. Rapport is a way to understand the interviewee’s perception of the world and a way of communicating that the interviewer understands their point of view (Dunn, 2010). Different measures can be made for enhancing rapport. Verbal and non-verbal techniques were applied during the interview to make sure the interviewee felt their responses were valued. This implied the use of nodding, pausing and providing examples relating to the questions (Dunn, 2010). Other visual signs the participants made when they reacted to questions were also observed. This was valuable when interpreting the transcriptions during the analysis.

The gatekeeper was present in the first two interviews. This was a requirement for getting access to the informants. He wanted to participate in the first interviews for the purpose of evaluating if the informants he had picked out was suitable for this study. He acted as a participating observer, asking follow-up questions when he found it could be of interest to this case. Because he worked closely with the pathways, he knew what it could be interesting to ask follow-up questions about. This was valuable learning to take into the next interviews. The presence of the gatekeeper could have acted as a limitation, possibly making the informants biased in their answers. However, it was not observed any hesitation or biased answers among the informants, rather an increased interest in discussing the topics at hand.

The interviews were all audio-recorded. Recording the interviews sets the occasion for a more natural conversation (Dunn, 2010). As an interviewer you are able to listen closely and be attentive and critical, instead of being occupied by writing notes. The only notes taken during the interviews was related to follow-up questions. Throughout the interviews, different topics were highlighted depending on the informant. The semi-structured guide made it possible to adjust the questions, and by recording the interview it was easy to follow new paths of argumentation. In advance of the interviews, every participant was given a consent form. They all signed the form, giving the opportunity to record and store the recordings until the end of the project.
4.4 Data analysis

The analysis of the data material begins during the interview when the researcher takes notes and afterward when the interviews are transcribed (Dunn, 2016). A transcript is defined as a “written reproduction of the formal interview which took place between researcher and informant” (Minichiello, Aroni, Timewell & Alexander, 1995, p. 220). It can be thought of as the raw-material of the interview, written out word-for-word. Transcriptions of interviews facilitates analysis and ensures the ground for analysis is based on a correct reproduction of the interview and the use of any quotes. It should be noted that the interviews were conducted in Norwegian. The transcripts were therefore translated to English. This could result in an alteration of the contents and act as a limitation of the study.

Content analysis is a common method to apply. Content analysis is a way of organizing data material into categorizes and provide knowledge and understanding of the phenomenon being researched (Dunn, 2016). Manifest content analysis considers the visible content on the surface of documents, where latent content analysis search for underlying themes and concepts (Dunn, 2010). To be able to perform a latent analysis a coding system is often used to sort out and retrieve the data.

During the interviews some of the pieces started to fall into place. By bearing in mind the theoretical framework and research question the analysis began even before the transcripts were written. The notes from the interviews were written right after the interview, including a summary of thoughts of personal interaction and analytical reflections. After reflecting around the interviews, the transcriptions were written. It took approximately four hours to transcribe an hour-long interview, making it a time-consuming activity. After completing the transcriptions, they were printed out and a preliminary manifest content analysis were conducted. When searching the transcript for manifest content recurring words and phrases were looked for, such as “collaboration”, “improvement”, “knowledge”, “Lean” and “innovation”. After the manifest analysis, a latent content analysis was conducted. The reoccurring themes discovered from the manifest analysis was used to code the documents. Once the document was coded, similar themes and themes with relevance for the research questions were looked for. Topics and aspects highlighted as important by the informant were searched for. In addition, possible explanations for why this was important to them and how it
unfolded was looked for. Some of the interesting topics that reoccurred in the majority of the transcripts was that pathways require coordination and collaboration, there is a need to institutionalize improvement, the complexity of the hospital and pathways hinders collaboration, Lean are deeply embedded in the work with improvement, the notion of what innovation is differs greatly. It was also noted that the informants had different opinions and perceptions of what case pathways and cancer care pathways entailed.

4.4.1 Complimentary data through qualitative content analysis of documents

In addition to conducting interviews, relevant documents were analyzed as an additional source of information. Qualitative content analysis is widely used as a research method with the purpose of making sense of written material such as interviews and documents (Cope, 2010). It is beneficial to know what you are looking for when conducting a content analysis. This helps to avoid reading through several documents of little relevance for your project. Documents analyzed in this study was found when searching for information about case pathways/care pathways/standardized care pathways/cancer care pathways and strategies for development and innovation at Oslo University Hospital. In addition to documents found online, some of the informants provided project reports and other internal documents. They also gave access to the Innovation Department's web-platform late in the process which made it possible to search for internal documents from several different hospitals. This brought valuable information about internal projects at the hospital, how they organize projects, how they share information and knowledge and how other hospitals have worked with patient pathways. As with the transcripts, surface information about the implementation and development of cancer patient pathways were searched for. When the main parts were highlighted, a latent analysis were conducted (Dunn, 2010). Topics regarding collaboration, learning, leadership and knowledge were searched for. Table 3 presents an overview of the documents analyzed.
### 4.5 Concerns in qualitative research

When conducting research using qualitative methods, one has to be aware of the ethical dilemmas and concerns that follows. Research ethics is broadly defined as “the conduct of researchers and their responsibilities and obligations to those involved in the search, including sponsors, the general public and most importantly, the subjects the research” (Dowling, 2010, p. 28). The Norwegian National Committee for Research Ethics in the Social Sciences and the Humanities (NESH) is an impartial advisory body providing guidance and advice on research ethics (The National Committee for Research Ethics, 2015). The ethical guidelines state that you, as a researcher, have to get informed consent from the participants before conducting interviews. Privacy and confidentiality must be ensured by anonymizing the names of the participants, and you need to make sure that your research does not expose yourself or your informants to harm (Dowling, 2010).

In the initial phase of the project the thesis was reported to, and approved by, The Norwegian Center for Research Data (NSD) and the Data Protection Officer at Oslo University Hospital. There are extra set of rules that applies when conducting research at hospitals. The rules are more comprehensive when sensitive information can be exposed. The most important factor concerning this study was to protect personal data about the employees and patients. Although this study was only interested in information about the organization and work processes, it was obligatory to apply for authorization to conduct the research. The participants’ name, professional title and the specific pathways studied have been anonymized to uphold the privacy of the participants. Because some of the informants are referred to as pathway

### Table 3: Overview of analyzed documents

<table>
<thead>
<tr>
<th>Analyzed documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Report 2017, Oslo University Hospital, Comprehensive Cancer Centre (CCC)</td>
</tr>
<tr>
<td>What is Patient Pathways? SINTEF, 2018</td>
</tr>
<tr>
<td>Innovation Strategy 2018-2022, Oslo University Hospital HF</td>
</tr>
<tr>
<td>Project Report – the Patient Pathway Project for Cervical Cancer, 2017</td>
</tr>
</tbody>
</table>

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managers, it was found necessary to anonymize the pathways they were associated with. As mentioned earlier, the gatekeeper did not wish to be anonymized.

All the informants were given a consent form where they were asked to consent to their participation in the study. The form included an introduction to the project and what it meant to be a participant in the study. They were informed that their identity would be anonymized, meaning their names and other characteristics would be excluded and unidentified in the thesis. The form also made it clear that the interviews would be recorded and gave information about how the recordings would be stored. Every informant was made aware of their right to withdraw their consent at any time during the study. Transcriptions and audio files were given codes and was stored at a closed password protected home area at the University of Oslo’s network. Personal information was treated confidentially. The information and recordings were only stored during the project and was deleted when the thesis was handed in. The collaboration with OUH did not entail that they were to be given transcripts and recordings. The only obligation was that they wanted the thesis and a presentation of the findings.

4.5.1 Reflexivity and positioning

There are three concerns that typically occur when conducting qualitative methods; (1) the formal issues raised by qualitative research projects, (2) the power relations, and (3) objectivity, subjectivity and intersubjectivity (Dowling, 2010). Subjectivity is the researcher’s ability to account for personal opinions, culture and individual characteristics when conducting research. Qualitative research gives emphasis to subjectivity because social interactions is fundamental in the associated methods. However, the researcher still has to be aware of how one’s opinions affect the research. Unconscious biases and assumptions may affect the questions asked and the interpretation of the information gathered. The role as an outsider in the hospital community in this study could however act as a benefit. Here, an impartial approach with no personal interests made sure that the results was not intentionally affected by the researcher. This thesis was written in third person to ensure an objective distance and keep a more formal language. However, the role as a researcher is acknowledged. Regardless of keeping an objective distance when the thesis was written, underlying subjective meanings could have affected the research.

In line with this, an important factor to comply in qualitative research is critical reflexivity, which is a “self-critical sympathetic introspection and the self-conscious analytical scrutiny of
the self as a researcher” (England, 1994, p. 84). Critical reflexivity involves a commitment to be theoretically informed and maintain self-critical ethical conduct, revolving around awareness of how to identify and resolve ethical dilemmas when they arise (Dowling, 2010). Collecting and interpreting social information involves personal interactions. Decisions about the interview relationship will differ consistent with the characteristics of the informants and the interviewer. As an interviewer and researcher, one has to put aside any predetermined mindset and practice critical reflexivity. Societal norms, expectations of individuals and structures of power influence the nature of the interactions between the interviewer and interviewee (Dowling, 2010).

A potential dilemma when interviewing leaders and doctors at hospitals, is the emergence of an asymmetrical relationship. Interviews of people with a high position in an organization or experts of some sort can be categorized as elite interviews (Smith, 2006). A potential challenge the researcher can meet during elite interviews is maintaining control of the interview. This was however not a problem in this case. The only time the interview steered off topic was when some of the interviewees got excited about a specific topic or talked about their work from a medical point of view. There were substantial differences between the participants and the researcher in this project, both in regard to experience and age. Despite reading several documents about the topic under study, there was unfamiliar jargon phrases and medical language that appeared during the interviews. However, this did not affect the relationship. The participants made sure to ask if they should explain something further whenever they talked in medical terms. They were all welcoming and seemed genuinely interested to be participating in the study.

4.5.2 Validity and reliability of the case study

The validity of a qualitative research project concerns whether the research has established correct operational measures for the concept studied, and thus if the study actually measures what the research question asks (Bradshaw & Stratford, 2010). It challenges the legitimacy of the data collected and the conclusions drawn. It is also concerned with whether the interpretation of the data reflects the reality and phenomenon under study (Yin, 2011). As a whole, it means establishing trustworthiness in your work (Bradshaw & Stratford, 2010). In quantitative research, validity relies on statistical generalization, in which a sample readily generalizes to a larger universe. For case studies, it relies on theoretical generalization (Yin,
To reach this generalization, a theory must be tested through replications of the findings in a second context, similar to the one studied. The geographically limited context of the study with analyzing one hospital and one city only could be a limitation to the generalizability of the study. The chosen hospital is a university hospital which also could act as a limitation because university hospitals have different characteristics than local hospitals, and so the study may not be applicable to replicate in a local context. Second, due to the time limit of this master thesis there is a limited number of participants in this study. The study included insights from eleven informants at a hospital that employees over 23,000 people. It is therefore necessary to note that the findings of this study do not apply to the whole organization.

A factor that could affect the validity of the research was the relationship initiated with Oslo University Hospital. Every participant interviewed was an employee at the hospital, as was intentional, which could make them biased in responses. Especially questions making the participants reflect about how OUH organize and work with specific processes challenged them. Some participants seemed hesitant to say something that would be considered as negative remarks. A reason for this could be that they were afraid the findings would be discussed with the gatekeeper. They were ensured that this were not to happen and what they said would be kept confidential.

To ensure the validity, multiple methods were used, and different theories were applied. Several interviews were conducted with employees in different positions at the hospital. To a high degree the same questions were asked to every participant, but some variations occurred. When interesting topics arose during some of the interviews, these were further investigated, which sometimes was at the expense of some pre-determined questions. Discovering new viewpoints about a phenomenon is one of the strengths of qualitative interviews, while at the same time reducing the validity. Another challenge was to remain objective during the process. During the initial meetings with the gatekeeper at OUH, he expressed his perception of the implementation of case pathways and what he thought was prominent barriers and challenges. This was valuable insights, but it was important not to let them affect the findings retrieved from the interviews with informants.

Reliability concerns the accuracy of the study. Ensuring reliability is done by minimizing errors and biases. The goal is that the study can be replicated by other researchers applicating the same design and methods, reaching the same results (Yin, 2009). A general way of ensuring
reliability is to make as many steps as possible operational and to conduct research as if someone is looking over your shoulder (Yin, 2009). As a way of ensuring the reliability of the study, a detailed explanation of the choice of methods, where strengths and weaknesses are deliberated and the procedure for analyzing the data material is discussed. The theoretical framework is also presented.

4.6 Summary

This chapter has presented information and explanations of the applied methodological approach in this study. The choice of conducting a qualitative case study with interviews and content analysis as methods have been elaborated. The story of the field of study was accessed have been presented as well as how the informants was selected. Possible ethical concerns have been reflected upon, in addition to how it has been tried to ensure validity and reliability. The next section presents the results of the data collection and discuss these in relation to the research questions.
5 Empirical findings and analysis

This chapter will present and discuss the empirical findings found in this study. Section 5.1 will provide a discussion of how the hospital organize improvement projects and how the perception of innovation affects the organization. The first research question: “how does Oslo University Hospital organize improvement projects?” introduces a discussion of the use of Lean-thinking at hospitals and how this relates to the hospital’s innovativeness. Section 5.2 presents an outline of the incremental learning practices at the hospital. This section ties the second research question: “how does Oslo University Hospital foster incremental learning?” to the derived findings and the established literature on DUI-innovativeness (Jensen et al., 2007; Salge & Vera, 2009, 2013). Section 5.3 includes a discussion of the empirical findings related to the third research question: “what are the perceived barriers of the implementation of case pathways and the improvement of cancer patient pathways?” This section will touch upon the literature on common barriers for innovation in public sector and health care sector and introduces a discussion of the barriers found in this study in relation to the literature (Cunningham, 2005; Koch & Hauknes, 2005; OECD, 2017; Osborne & Brown 2013). Finally, section 5.4 will bind these research questions together with a discussion of how hospitals best can organize cancer treatment to cope with future societal challenges. Here, current outcomes of the pathways are discussed together with the enabling factors and barriers that participants have experienced. Table 4 provides an overview of the case study as a starting point for the analysis.

<table>
<thead>
<tr>
<th>Case study</th>
<th>Type of innovation (primary)</th>
<th>Associated innovations</th>
<th>Context</th>
<th>Relationship affected by innovation</th>
<th>Public involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of case pathways and development of standardized care pathways at Oslo University Hospital</td>
<td>Delivery (service)</td>
<td>Conceptual Organizational</td>
<td>Institutional, single hospital</td>
<td>Relationship between service providers and patients</td>
<td>Direct (patient)</td>
</tr>
</tbody>
</table>

Table 4: Overview of case study (Cunningham, 2015).
The innovation in question are primarily considered a service innovation for the reason that it changes how the patients are led through their course of treatment. The innovation was initiated from a need to provide patients with a more predictable and safer course of treatment. In addition, it also stemmed from a need to conduct and organize care processes more efficiently which prompted several organizational changes. This study chose to look at the innovation from an organizational perspective.

5.1 The perception of innovation

A purpose of this project was to contribute to extend the understanding of innovation in hospitals and initiate a discussion on the relationship between Lean and incremental innovation. This section will present an overview of how OUH and the participants in this study understands innovation. Further, the use of Lean at OUH will be discussed with a following discussion about the relationship between incremental changes and Lean.

5.1.1 Perceptions of the case in study

Before discussing the understandings of innovation, a thought-provoking starting point is to discuss the understandings of the case in study, i.e. case pathways and cancer patient pathways. One would think that the hospital staff, both clinicians and support function staff, had a good notion of what case pathways and cancer patient pathways entailed. As it turned out, this was not the case. Regardless of the distinction between the two concepts, they are very intertwined in practice. For the most part, the informants did not view the terms case pathway (Norwegian term: pakkeforløp) and cancer patient pathway (Norwegian term: pasientforløp) as two separate concepts. They used the term pathway when they talked about their experiences with both case pathways and cancer patient pathways. During the data collection a pattern of how the concepts were distinguished were registered; when the discussion surrounded the implementation, they referred to case pathways, when discussing improvement, they talked about cancer patient pathways. Given that the case pathways in reality represent measurement points, it is the cancer patient pathways that must be developed and improved in order to increase the performance of case pathways. One informant said that the confusion around the concepts have complicated the improvement processes. Another reported that many of the employees involved in the care for cancer patients at the hospital does not know the difference between the two pathways. There are also different codes used in the illustrations that many are unsure of what entails.
5.1.2 Perceptions of innovation

The official definition applied by Oslo University Hospital defines innovation as something “new, useful and utilized”. It does not have to be new to the world, but new to the hospital (OUH, 2018). Every participant, except clinician 1, was asked how they understood innovation and what it meant in their work setting. There were lots of variations in the responses between the two groups. The clinicians primarily related innovation to research and product innovation, while the participants from support functions related it to organizational changes, some to radical changes and other improvements. Table 5 presents an overview of the participants’ responses to what they answered when asked the question “what do you perceive innovation as?”.

<table>
<thead>
<tr>
<th>Perceptions of innovation</th>
<th>Clinicians</th>
<th>Support functions</th>
<th>Support functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinician 2</td>
<td>“Medical research, inventions, “carry on the profession”. This is especially important for a University Hospital, being a forefront hospital for cancer research”.</td>
<td>Informant 1</td>
<td>“Thinking differently about today’s way of organizing and develop a plan for how to get there”.</td>
</tr>
<tr>
<td>Clinician 3</td>
<td>“Medical innovation, improving treatment. But also, system-based improvements, where particularly IT is important”.</td>
<td>Informant 2</td>
<td>“Innovation is improvement on all levels. Can be big projects, but also small improvements that can make a big difference”.</td>
</tr>
<tr>
<td>Clinician 4</td>
<td>“I don’t know. I don’t think it is related to our work setting”.</td>
<td>Informant 3</td>
<td>“New, useful, utilized – depends on the case. But innovation isn’t really an innovation before it is utilized. New medical equipment is especially important”.</td>
</tr>
<tr>
<td>Clinician 5</td>
<td>“Every day development and improvement, create a learning culture, making it a part of the language”.</td>
<td>Informant 4</td>
<td>“Innovation represents a jump, something new. In some cases, it can be small improvements, but also new products were commercialization is important”.</td>
</tr>
<tr>
<td>Clinician 6</td>
<td>“Medical inventions, better treatment”</td>
<td>Informant 5</td>
<td>“Innovation is more than just radical projects; it is small improvements”.</td>
</tr>
</tbody>
</table>

Table 5: Perceptions of innovation.

Clinician 5’s perception stood out from the rest. The perception of this informant was more similar with the perceptions of the employees from the support functions, than to the rest of the

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3 The idea to ask about the perception of innovation came after the first interview therefore, the first participant was not asked this question.
clinicians. One possible reason for this is that this clinician has studied management and acted as a facilitator in the implementation process of case pathways. The informant is also a member of the Network for Continuous Improvement, can be argued to have a dual role in relation to the groupings between the informants done in this study. The positions of the employees from the support functions also seemed to influence their perception. Informant 3 works in the Innovation Department; it is was therefore not surprising that innovation was related to medical innovations given that the department works primarily with product innovation projects. The majority of the informants from both the Innovation Department and the Network for Continuous Improvement said most changes implemented at the hospital are incremental in nature. They acknowledged that innovations related to research, e.g. new medical equipment and new treatment regimes, is important for the medical domain. However, they viewed incremental innovations on micro-level as more important for daily operation and the delivery of care. Informant 2 from the support functions stated that simple and minor changes often leads to large savings and makes a bigger difference than “big and fancy” innovation projects.

During the discussion of what innovation meant in relation to their work-setting, many of the informants began to question whether pathways were considered as an innovation. Informant 5 from the Innovation Department said they consider the usefulness of a project along four dimensions: economy, organization, quality, and clinical. Further, the informant argued that: “Innovation is mostly concerned about the organizational dimension, because this will transfer value to the other dimensions. It is also in this dimension most people experience the value of pathways” (support function, informant 5).

When this was discussed further, the informant recognized that successful pathways will be useful in all these dimensions. Pathways can generate value in the clinical dimension because they affect treatment and risk, and the patient will be treated at the right time. Pathways also remove local problems, which have an economic value. The patient will experience a better offer and the employees feel value in their work, which makes them motivated to continue to improve. The outcome will be an overall impact on the quality. However, the informant was reluctant to define pathways as an innovation:
There is a broad agreement that pathways are useful. But we need to look at the numbers to evaluate if it is utilized. I don’t believe we are there yet. And because pathways were adapted from Denmark, I don’t know if we can call it an innovation

(support function, informant 5).

Informant 4 from the support functions had a different point of view, believing that pathways indeed were an innovation because it was a new process implemented at the hospital and it generated several changes. This discussion illustrates the large variations of perceptions surrounding the core concept of what innovation entails. Because many employees at OUH conceptualized innovation as something radical and difficult, it has resulted in a reluctance towards innovation. One informant was of the impression that because OUH is such a large organization, the responsibility to innovate lies in the hands of “someone else”. The informant continued with: “I can play the ball, but they innovate” (support function, informant 1).

This also counted for other informants, where few who thought of innovation as a central task in their work-setting. However, when discussing how they contributed to improving the pathways, one could argue that they participated in innovative activities without being aware of it. Regardless of the organizational capacity for innovation, one striking feature most of the informant agreed on was the key role played by the presence of highly skilled and committed “champions” who drove innovation processes forward. Mechanisms such as appraisals, dialogue and evaluation all showed to be key components for organizational learning, but the willingness to experiment and try new approaches was also viewed as a useful attribute for the success of the innovation studied. Informant 3 and 5 from the Innovation Department highlighted the importance of creating an innovation friendly culture at the hospital. As motivation increases through collaborations, innovation is triggered.

The understandings of innovation revealed in this study are in line with the understandings Salge and Vera (2009) uncovered in their study of English Acute Care; a distinction between science- and practice-based innovativeness. The notion of innovation is relatively new in the context of the public sector, which may be the reason for the different interpretations of the terminology (Bloch & Bugge, 2013). As stated in the theory section, innovation is understood as both the development and the implementation of novel products, processes and services. In
order for a change to be labeled as innovation it must have a certain utility and it must have been put to use (Thune, 2015). A prerequisite for creating increased innovation ability in the health care sector, and particularly in hospitals, is that the employees have a common language and understanding of what innovation is and not, what opportunities innovation can provide and how innovations are generated, created and implemented (Directorate of Health, 2018).

Previous research has shown that the health care sector has an unclear understanding of innovation, both in policy development and in practice (Thune, 2015). They seem to have a good understanding of science-based innovation, and hospital staff experience incentives and support to work with such innovation. However, when defining innovation in a broader sense, such as developing and implementing novel products, services and process, they do not perceive this as innovation (Thune, 2015). When the majority of health care employees have such a narrow definition of innovation, only considering product innovation in relation to research as innovation, it can serve as a challenge for promoting innovation in the sector (Thune, 2015). The previous discussion shows that there are significant variations in the understandings of innovation between the informants. The response of informant 1: “I can play they ball, but they innovate”, are similar to a barrier commonly associated with continuous improvement. Many employees have an embedded belief in specialists as the problem-solvers and a disbelief of their own ability to contribute (Bessant & Caffyn, 1997). A common attitude of “not everyone is creative” can emerge and possibly inhibit improvement processes and innovation.

Few of the informants considered innovation as a part of their daily work activities, or as something they felt responsible to contribute to. However, it appeared from the discussions that they do in fact practice innovative activities, without recognizing it. This can inhibit the overall innovativeness of the hospital, because the potential of these activities is not utilized. It is important for the hospitals to promote an understanding of innovation that relates to other important changes and development processes in addition to research. Hospitals has a comprehensive innovation mission, which makes it important that different types of innovation are seen in context and that hospitals facilitate such an understanding (Thune, 2015).

Research support that “hidden innovation” often represents the innovation that matters, but goes about unrecognized (Martin, 2016; NESTA, 2007; Salge & Vera, 2013). Changes of this type are often “low-hanging fruits”, conducted as an informal and unstructured process. Larger
and more radical changes are often implemented by a formal and structured process (Jensen et al., 2007). The informants from the support functions shared this perception, in that they noted that small improvements in daily practice are the most valuable.

As pointed out from the informants, “innovation management should not remain limited to administering a pipeline of innovation projects”. Instead, there is a need to create a culture for organizational innovativeness through a combination of effective incentives and support mechanisms (Salge & Vera, 2009). A way to create increased awareness for innovation is to enhance the knowledge about innovation terminology, share good examples of own and others’ innovations and establishing dialogue and reflection on the value of own practices (Bason, 2018). This also illustrate the importance of increased DUI-learning.

5.1.3 Continuous improvement projects, Lean and innovation

Regardless of the common agreement that incremental innovations are important for daily work activities, the organization of improvement projects at OUH further highlights the divided understanding of innovation. Projects related to organizational changes which are not driven by research or represents radical changes, are organized as Lean projects. Such changes include development and improvement of new process. The hospital therefore makes a distinction between innovation and continuous improvement, which can lead to the misconception of the innovative work conducted at the hospital. This distinction is embedded in the organizational structure at OUH, with the Innovation department and the Network for Continuous Improvement. The motive for including the discussion of Lean and innovation came about during the data collection. All informants from the support functions devoted a lot of time explaining how they worked with continuous improvement using Lean tools in addition to how this was greatly embedded in their work practices. However, while discussing what Lean and continuous improvement entailed at OUH, it became clear that the distinction between the two and innovation was quite vague.

The informants from the support functions told that the Network for Continuous Improvement take lead on changes involving improvements of flow in processes (Lean projects), whereas the Innovation Department have ownership of larger innovation projects often related to research. Both departments have a web-platform where employees can submit ideas or suggestions. When an idea or suggestion is submitted and a project is initiated, the departments
consider the usefulness, barriers, amount of resources needed and costs when deciding if the project is an innovation- or Lean project. Informant 3 from the Innovation Department noted that the complexity of the project determined the innovation “height”, or the innovation “jump”, and thereby what type of change it should be categorized as. When it comes to pathways, no pathway is the same. Some have many consequences, whilst others only have simplifications. Pathway projects have therefore been organized differently, some as innovation projects and others as Lean projects. The breast cancer pathway is the biggest cancer pathway at OUH, and it was argued that this was the reason for the project to be organized as an innovation project rather than Lean project. The way this project was organized illustrates the assumption the hospital has towards innovation and the large differences between pathways. A difference the informants highlighted between the innovation and Lean was the usage of different methods and tools. Informant 3 from the support functions noted that Lean applies a more rigorous and statistical approach, actively using numbers to identify areas of improvement. Innovation uses a more fluent and process-oriented approach, where outcomes of every step in the process are evaluated and stops the project if it turns out the project will not reach the desired outcomes. While explaining this distinction, informant 3 acknowledged that the principles of the methods in fact were similar.

From discussions with the informants, is seemed like the use of Lean tools has been beneficial for removing specific bottlenecks in the pathways. There are a lot of tools available to use, but the informants were unsure whether this is clear for the hospital staff. When it comes to making the employees actually use the tools, they pointed to other much-needed changes that must be enforced. These includes changes in structures and culture around the pathways. Informant 5 from the support functions noted culture is an important element to consider:

*There are many factors that affects the way we use tools, but the usage of tools will also affect these elements, like culture. We take too little consideration on culture when we start to work with new methodologies, projects or processes. There is a lot of culture at this hospital which makes this even more important* (support function, informant 5).

Informant 2, 3 and 5 from the Network for Continuous Improvement and the Innovation Department were unsure and hesitated when asked about the difference between continuous
improvement and innovation. Informant 2 said it was impossible to separate innovation and continuous improvement as two exclusively categories. They discussed that many innovations in principle are the same as Lean projects, but some innovations are entirely different, such as product innovations where commercialization and patenting are central. Informant 3 noted that some types of innovation are similar to continuous improvement, while others are very different: “Product innovation is a whole different race. But service innovations and incremental innovations, like improvements, are more difficult to categorize. Service innovations are complex and cannot be put in one category” (support function, informant 3).

Informant 5 from the support functions said “one should not view innovation and continuous improvement as a competition, but rather as two concepts that stimulates one another”. The difference between the two concepts was therefore not evident for the informants, even not for those working closely with the concepts. This is also reflected in the literature that has opened the discussion on the relationship between continuous improvement and innovation (Bessant & Caffyn, 1997; Radnor et al., 2012; Osborne & Brown, 2013).

Continuous improvement is a concept largely associated with the public sector (Osborne & Brown, 2013; Moore, 2005). It is neither a single event, nor a single technique or tool. It is a long-term learning process (Bessant & Caffyn, 1997). Routines is an important part in developing continuous improvement in organizations and represent a particular way an organization has learned to deal with some aspect of the innovation process (Bessant & Caffyn, 1997; Nelson & Winter, 1982). One can draw a parallel between this and incremental learning. Incremental learning is also embedded in routines with the purpose of enhancing problem-solving and employee participation. Bessant and Caffyn (1997) argues that when continuous improvement becomes embedded in the organization, it is possible to “move towards a devolved form of innovation” (p. 10). This requires high levels of participation in experimentation rather than just improvement. This perception of continuous improvement is similar to the perceptions of the informants; that continuous improvement and incremental innovation are closely intertwined and stimulates each other.

However, Osborne and Brown (2013) points to the problematics of regarding continuous improvement and innovation as the same. They argue that the distinctive nature and challenges of innovation, as opposed to continuous change, can become lost. This is much because innovation only will be considered as a specific discontinuous form of change. While
innovation and improvement often have been perceived as synonymous this is not always the case (Osborne & Brown, 2013).

As for the use of Lean as a method for practicing continuous improvement, there are several examples of positive outcomes (Bessant & Caffyn, 1997; Radnor et al., 2012). The technique of analyzing operations and structuring work processes was in fact translated into health care in the form of care pathways (Vanhaecht et al., 2007). It was the reform New Public Management that brought principles from the private sector to health care organization, such as hospitals. One of these principles was Lean, where the purpose is to continuously improve the efficiency and quality of the service delivery. Common outcomes of the use of Lean in healthcare have been reduced waiting times, increases in quality through a reduction of errors and reduction in costs, as well as increased employee motivation and customer satisfaction (Radnor et al., 2012). Given these outcomes, it therefore seems appropriate to organize pathway projects as Lean projects and apply Lean tools. The focus of the Lean projects for pathways conducted at OUH has been to look at waste, variations and capacity management, locating bottlenecks and remove them. The feedbacks from the informants and information provided through project reports, indicate that they have managed to get positive outcomes from the use of Lean tools. The foundation of Lean stresses the high levels of employee involvement in innovation processes through continuous incremental problem-solving. This also draws a line to the similarities to incremental learning and continuous improvement.

However, Radnor et al. (2012) provide a different viewpoint of the use of Lean in health care. They argue that reforms to promote more evidence-based and standardized clinical practice are to some degree inconsistent with the variability and ambiguity of clinical practice (Radnor et al., 2012). The implementation of Lean can in many cases lead to a narrow focus on tools and techniques. As a result, activities such as developing a culture of ongoing improvement and structured problem solving become neglected (Radnor et al., 2012). Novelty often increase the uncertainty within activities (how to do them), while Lean practices assume stable and routine processes (Browning & Sanders, 2012). It is therefore more challenging to be Lean when you find yourself in an environment characterized by a need for innovation (Browning & Sanders, 2012).

Given the discussion of literature together with the presentation of the perceptions of the informants, one can argue that there is no either-or relationship between either continuous
improvement, Lean or innovation. The discussion indicated that it can be beneficial to employ both Lean tools and innovation practices. An organization which employs both, as OUH, should not strive to be either innovative or Lean-focused, but a combination. However, an important takeback is to emphasize incremental innovation as *innovation*, even when using Lean tools and enforcing improvements. As informant 5 from the support functions stated, which are in line with the arguments from Radnor et al. (2012), it is important to look at other elements like culture, not just have a narrow focus on the tools.

A main point taken from the previous discussion is that the hospital staff considered small, incremental innovations to stand for the majority of the innovations conducted at the hospital. They also viewed these innovations as most valuable for daily practices. A relevant question to ask next is how the hospital facilitate the emergence of such incremental innovations?

### 5.2 Incremental learning

This section will analyze findings based on RQ2: *How does Oslo University Hospital foster incremental learning?* The analysis will start off by looking at the patient journey as a learning process and set the bar for why knowledge-sharing and interaction is important in this process. The next section will investigate the presence of incremental learning practices at OUH, followed by a discussion of the relationship between tacit and codified knowledge linked to the development of pathways.

#### 5.2.1 The patient journey as an interactive learning process

The patients’ journey in the hospital can be viewed as a complex problem. The implementation of case pathways and further development of cancer patient pathways were initiated as a solution to this complex problem. A patient’s pathway moves across the hospital, crossing several lines of departments and involving a number of people. To embed the pathway processes as a new, shared routine for the whole hospital, all the involved departments and actors must interact and share their experiences. The informants spoke about experience-sharing as an informal routine when discussing whether this was a focus at the hospital. Documentation of the pathways are organized as projects where experienced facilitators assist the pathway management team, and representatives from all the involved professions and departments contribute. Regardless of the formal structure of the projects, the informants reported that there has not been an explicit focus on exchanging knowledge, although they view
this as highly important. Clinician 3 said the pathway management group of the associated pathway had been inspired by and gotten ideas from other pathways. However, because they had chosen to organize the pathway regionally, they had neither found it natural to share their experiences with others, nor had anyone asked them to. Another pathway in the study was a pioneer of developing cancer care pathways. Still, they had not been asked to share their experiences.

Pathways are very different in terms of patient volume, if it moves across several hospitals, and the number of people involved. Because the pioneer pathway is small, with a limited group of patients, others expressed they had found it difficult to learn from them. Clinician 5 said it is important to hear about the successes, but finds it hard to learn from them:

> It’s important to highlight the good stories. But for us, with a complex and large pathway, it has been hard to understand how the lessons from that successful, yet small, pathway can be applied by us. It feels more as a slap in the face than help (clinician 5).

The pathway management group of the pioneer pathways had promoted their work themselves by writing in reports and discussed it at management meetings. Even though they have a smaller pathway, they still think their experiences and knowledge of working with pathways would be of value and useful to others. Clinician 2 experienced this hands on:

> One of the pathways I worked with did not include patient coordinators at their multidisciplinary team meetings. Because the other pathway I was involved in did this and I knew how valuable it was, I advised them to include the coordinators. And it turned out to have great value there as well. But this had not happened unless I was involved (clinician 2).

Clinician 2 found it valuable to use the experiences regardless of the differences in complexity and size of the pathways. Another pathway manager shared this point of view. Clinician 1 told about the applied tactic to actively approach decisionmakers, seek new knowledge and study how other departments works. The purpose is to get new ideas and implement them in the
department. The informant said that: “for one of our projects, I saw how another clinic worked and I adapted this work practice within our clinic. I have experienced that it is important to be a leader that facilitates, not controls” (clinician 1).

This illustrates the value of sharing experiences and that there is a desire to learn from others. Knowledge-sharing are, according to the participants, mostly done by own initiatives and needs to be formalized. Clinician 3 stated that one pathway works closely with hospitals all over the country because the respective hospital is a second opinion hospital. Clinician 3 said a benefit from this partnership is that it results in better decisions regarding patient treatment. Collaboration increases the access to valuable knowledge, e.g. from nurses or physical therapists, who usually are not included in the decision-making process. Clinician 5 indicated that the limited number of University-hospitals in Norway reinforce the importance of collaboration:

Norway is a small country. The expertise is often gathered at one place, for example the cancer community at Radiumhospitalet. We are therefore dependent on collaborating with local hospitals. Multidisciplinary team meetings are a great arena for learning and knowledge development (clinician 5).

It was highlighted as crucial that everyone involved in a pathway gathers around the same table and discuss problems and possible solutions for patient cases. When asked about what the most important factor for the success of pathways is, all the informants answered multidisciplinary team meetings and collaboration. Because every pathway is different for every patient, it requires a combined effort. Clinician 3 expressed that discussion with others generate learning opportunities. The clinicians spoke about this as important for both the patient and the staff, because it eases the burden of making though decisions while at the same time contributing to an enhancement of the medical quality. Clinician 5 indicated that the pathway teams must get up and running in order for this to be formalized. In one interview, it was discussed that improvements must be put into system so the value of collaboration can be utilized. Informant 5 from the support functions stated there was a lot of talk about multidisciplinary collaboration at patient level, but this was just as much needed on an executive level as help to solve the bigger problems.
Acquiring knowledge about why practices works, not only the acceptance that they work, are essential for new developments (Jensen et al., 2007; Nelson, 2004). This is also true for practices that does not work. The process of further developing cancer patient pathways in order to comply with the case pathways, is a process where it is essential to acquire knowledge from others of why some practices work or did not work. If every pathway management group, or all the involved actors were to share knowledge and experiences with each other it could reduce variations, improve quality and spur idea generation. As is well-established, many innovations occur from learning from others (Albury, 2005; Jensen et al., 2007). To be able to embed knowledge sharing routines, the hospital must foster a culture which encourages collaboration and communication (Salge & Vera, 2013).

As stated in the theory chapter, innovation is often a result of knowledge sharing and learning. Which again makes it a result of interaction, since this is the prerequisite for learning (Lam, 2005). Employees face on-going changes that confront them with new problems every day. Some problems will be specific while others more generic. When the process is complex it will involve interaction within and between people and departments which may result in new shared routines for the organization (Jensen et al., 2007). This was also echoed by the informants, in relation to the multidisciplinary meetings. The DUI-mode of learning is essential during this problem-solving process. Even though DUI-activities often are unrecognized and happens unintended, it can be fostered by building structures and relationships which enhance and utilize learning by doing, using and interacting (Jensen et al., 2007).

The prevalence of interaction and collaboration will also benefit the performance of the hospital. Hospitals with more incremental learning capabilities demonstrate notably higher risk-adjusted patient survival rates than those with less developed incremental learning capabilities (Salge & Vera, 2013). In addition, hospitals with increased focus on learning and creativity will also show signs of higher innovation performance (Dias & Escovol, 2013). Research has revealed the importance of organizational structure, culture and strategy as determinants for performance (Salge & Vera, 2013). Strategies sets a direction and can be used to generate innovation. However, it is not enough to have a strategy for innovation if the culture and structure does not support the strategy.
In order to reach the overarching goals of pathways, it is important to include the hospital staff and create a culture where it is accepted to speak up and come up with solutions. This highlights the vital importance of strong incremental learning routines. It is especially important in healthcare, where the detection and reporting of problems is of crucial importance because the errors might have severe consequences, i.e. hospital staff at OUH is required to report all deviations in the local platform “Achilles”. As the informants noted, it is of great value to have a collaborative environment where deviations and errors can be talked about and hopefully contribute to reduce the occurrence of such errors. Strong routines for detecting, reporting and learning from errors, will have considerable potential for improving the quality of care in hospital settings (Salge & Vera, 2013). For these routines to flourish, managers need to encourage the employees to report errors, incidents and other problems, and initiate an open discussion. In addition, ideas submitted by all staff members must be valued and acted upon. Staff members should also be involved in key decisions that affect their work (Salge & Vera, 2013). The following section will discuss whether these routines are present at OUH.

5.2.2 Incremental learning at Oslo University Hospital
The measures used by Jensen et al. (2007) sought to capture managerial perceptions, which could diverge from organizational reality. Some of these measures was not found relevant to ask the group of participants in this study. Measures from Salge and Vera (2009, 2013) was therefore also included when constructing questions to measure the intensity of incremental learning in the improvement processes of pathways at OUH. Based on previous work by Jensen et al. (2007) and Salge and Vera (2009, 2013), a new set of measures was developed to fit the context of this case. It was found necessary to include measures that captured both the presence of systems and encouragement for suggesting ideas and reporting errors. The purpose was to investigate if (1) the hospital has systems for reporting and suggesting ideas and errors, and (2) whether the employees are encouraged to use them. Table 6 gives an overview of the measures used to capture incremental learning in this study. The following sections provide information and discussions of the presence of these indicators.
Table 6: Measures used to capture the presence of practices supporting incremental learning.

<table>
<thead>
<tr>
<th>Measures used to capture incremental learning in this study</th>
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<tbody>
<tr>
<td>Interdisciplinary workgroups</td>
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<tr>
<td>Systems for collecting suggestions and ideas</td>
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<tr>
<td>Encouragement to suggest new ideas for improvement</td>
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<td>Systems for reporting errors</td>
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<td>Encouragement to report errors</td>
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<tr>
<td>Softened demarcations</td>
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<td>Involvement of patients in improvement</td>
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<td>Involvement of employees in change</td>
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**Reporting errors and suggesting ideas**

To report errors and suggest ideas are important and the hospital must foster such practices. The overall impression of the informants is that OUH has an open culture and soft demarcations which has lowered the threshold to come up with suggestions. Clinician 1 described the organizational structure in the respective department as stimulating for suggestions: “the flat hierarchy makes the distance from employees to leaders shorter, and it feels less intimidating to talk to your leader about a need you experience” (clinician 1).

Several of the informants told about a measure the hospital has taken for increasing the involvement of employees. They have implemented two sets of blackboards in all the departments at the hospital. This is done in order to increase the participation of hospital staff in service development and institutionalize improvement routines in daily practices. By investing in such idea suggestion systems, they make a direct investment in incremental learning. One blackboard is for registration of observations, feedback and errors in daily work activities. This board helps to capture deviations and get control of the resources at hand. Clinician 5 noted that discussing mistakes and errors contributes to more improvements and fewer mistakes. The second blackboard is used for reporting suggestions for improvements. Informant 4 from the support functions expressed that the usage of blackboards has resulted in a lot of suggestions and ideas. Also, from every suggestion they learn something. Suggesting ideas requires recognizing improvement possibilities from personal experience, but also interpreting and sharing these insights and ideas. The blackboards fulfil this requirement by encouraging the staff to write down personal observations and share them with the department. Some of the informants had observed an increase in the motivation after this implementation because everyone felt they could contribute by suggesting solutions to problems. Because of
the high number of difficult cases, there is a lot of frustration among hospital workers. The informants said it has helped being able to articulate some of these frustrations and propose solutions for how some can be avoided. One of the pathway managers highlighted the importance of collecting every idea the staff comes up with, and not let anyone “slip away”. If there is a lack of resources and capacity at the time the idea is suggested, it should not be rejected but put on hold:

We must use ideas and experiences from successful projects on other suggestions. When we get a suggestion from the staff, we work together and patch the idea and suggested solutions together, have a discussion within the department before we talk to the management and presents them with potential benefits (clinician 1).

Clinician 1 explained that when one staff member articulates a need, there are often several employees who experience the same. It is therefore important to listen to all needs, ideas and suggestions. This was promoted as the key to solving the problems that arise. Several participants said that multiple changes had been implemented as response to suggestions. These will be elaborated later in this chapter, under section 5.4.3.

In addition to the blackboards, the Innovation Department at the hospital have a web-platform where employees at OUH and other hospitals can submit ideas for innovations. The Innovation Department usually gets involved in projects by “champions” who knows about the resources and knowledge at hand, or when they discover a need in a clinic. “Champions” refer to employees that has the desire to improve the hospitals and actively initiate improvement processes. The Network for Continuous Improvement is in the works of developing a similar platform. Informant 3 from the innovation department said that several ideas are put to life, but there is potential for realizing even more. Informant 3 also told there are variations in the submitted suggestions, but for the most part there are suggestions about service design projects, primarily related to treatment, i.e. nurses treating the patients at their nursing home.

In the past, the hospital culture was dominated by the views of physicians, but has now become diversified, where everyone, such as nurses, physical therapists and doctors, equally are encouraged to report suggestions. This shows that the organizational structure and culture
affects the incremental learning dynamic. When moving from a hierarchical culture to inviting all employees to participate it has resulted in a more including environment. This again has increased the motivation of the employees. It is important that the staff feel an ownership to the work they do for both motivation and stimulation of ideas. The goals of the hospital management should be to support employees in innovating by ensuring they have the ability, motivation and opportunity to come up with new approaches (OECD, 2017).

**Involvement**

The majority of the informants said they had been involved by OUH from the beginning when the case pathways was implemented. A potential bias in these responses is that all participants were chosen on the basis of their involvement in the process. However, one clinician pointed out that the involvement included getting information about the implementation, not being a part of the decision-making process. Given that this was a government-initiated process, this was neither to be expected. But the overall impression seemed to be that they get involved if changes affecting their work are to be implemented.

The informants said that OUH has made an initiative to include representatives from every profession (radiology, pathology etc.) in the beginning, during and after implementation of changes. They have acknowledged the need to include all involved parts throughout the process to get insights from where “the shoe is pressing” (support function, informant 5). There is an annual meeting held for the pathway management groups, where everyone involved in the pathway gathers. However, several of the informants expressed that it is not enough to do this once a year, each pathway has to implement this as a regular routine. Informant 5 from the support functions explicitly stated: “It is all about breaking an elephant down in smaller pieces. People with different point of views and focus areas must be involved. A single point of view will not get you anywhere” (support function, informant 5).

Involving employees is highlighted by the informants as an important factor for improving pathways. The frontline-employees are the ones who can create an improvement mentality in the departments. It is therefore important to include the ones who work closely with pathways because they have the medical knowledge as well as the hands-on experience. Informant 1 from the support functions said: “the support functions are facilitators, the clinicians has to do the dirty work”.

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When asked whether there is a focus on involving patients in developing pathways the participants from the support functions said that it should be a priority, but there is a specific department that coordinates the involvement of patients. Clinicians said they find it difficult to include the patients. According to national guidelines, patients should be involved in every decision regarding their own case. This is sustained. The informants said patients are involved in decisions about their own course of treatment, but not when it comes to the development of services of relevance to them. OUH has a web-based patient satisfaction survey open for all patients treated at the hospital. The main purpose of the survey is to identify areas for improvement and are constructed as a course of action to include the patients in the development of future care. The latest report lists the three greatest challenges OUH needs to improve according to the patients. These were (1) information sharing about diagnosis, (2) involvement in decisions concerning treatment, (3) organization of the institution’s work (OUH CCC, 2017). A patient statement included in the report reads the following: “The professionals’ skills and compassion are great, but the logistics and administrative routines are inefficient” (patient with head and neck tumor, OUH CCC, 2017)

This statement illustrates that patients are aware of, and care about, the efficiency of the service delivery at the hospital. It can therefore serve as an argument for involving patients in development processes at the hospital. It is important to locate the right people, combine competences and experiences, and involve both clinicians and support functions in the improvement process of pathways. The involvement of staff across the hospital is important for incremental learning, because it relies on frontline employees’ learning by doing and using (Salge & Vera, 2013). OUH seem to have the mechanisms necessary to involve employees, but struggles with involving users, which here are the patients.

**Presence of practices supporting incremental learning**
The presented table 7 provides a summary of the findings from this section. The table indicates with a “x” if the measures are present at OUH and provides examples of practices that support incremental learning. As indicated from this overview, the hospital has a high presence of practices supporting incremental learning and the DUI-mode of innovation. The question of whether the hospital (1) has systems and (2) encourages the employees to use them. The majority of the informants said the hospital had different systems for reporting ideas and errors and that they were encouraged to use them. The only indicator that was not reported as present was involvement of patients in improvement.
Measures used to capture incremental learning in this study

<table>
<thead>
<tr>
<th>Measure</th>
<th>Presence of measures</th>
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</thead>
<tbody>
<tr>
<td>Interdisciplinary workgroups</td>
<td>X (e.g. multidisciplinary teams)</td>
</tr>
<tr>
<td>Systems for collecting suggestions and ideas</td>
<td>X (e.g. blackboards, web-platforms)</td>
</tr>
<tr>
<td>Encouragement to suggest new ideas for improvement</td>
<td>X</td>
</tr>
<tr>
<td>Systems for reporting errors</td>
<td>X (e.g. Achilles and blackboards)</td>
</tr>
<tr>
<td>Encouragement to report errors</td>
<td>X</td>
</tr>
<tr>
<td>Softened demarcations</td>
<td>X (in some departments)</td>
</tr>
<tr>
<td>Involvement of patients in improvement</td>
<td>Not present</td>
</tr>
<tr>
<td>Involvement of employees in change</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 7: Presence of measures for incremental learning.

5.2.3 Making tacit knowledge codified?

A compelling question that arises is whether the documentation of standardized pathways can be characterized as codified knowledge (Jensen et al., 2007)?

A patient’s journey within the hospital has excited from the very beginning of medical treatment. Patients have always started a process by being admitted, then they receive treatment before they are being discharged. However, there has never been a recipe on how this process should be conducted. The implementation of case pathways was a top-down initiative constructed on the basis of general principles and guidelines about cancer treatment with the purpose of making a process of “the way things are done” into something more tangible. There was an apparent need to make this DUI-based process more formalized due to the increasing waiting times patients experienced. This initiative can possibly be viewed as an admission of the fact that the delivery of care had been a tacit process prone to variations. An important starting point for developing pathways is that everyone must speak the same language. Standardization is a way of creating a common language. Processes need to be simplified, a logical and functional overview of the pathways must be made and a good arena for communication is required. Informant 5 from the support functions highlighted the importance of talking about the construction of pathways:

*We need to illustrate how we think the pathways look like, how we want the pathways to look like, and what they actually look like. We need to sit down with all involved parts and break the pathways down in pieces. Someone at the top can’t dictate the development, the bottom has to be included* (support function, informant 5).
Education and training systems generalize and “embody” knowledge in people. OUH offers several learning programs and seminars, and thus stimulate to know-who knowledge. However, informants expressed that this is not enough for improving daily work practices. They expressed that learning need to increase across the hospital. Not only by participating in management programs, but also by working together and sharing experiences daily. The mobility of employees is an important mechanism for spreading experience-based knowledge (Jensen et al., 2007). The introduction of the multidisciplinary teams is an example of mobility and a way of breaking down the silos. Although knowledge can be categorized as either tacit or codified, they are in reality complementary (Nonaka & Takeuchi, 1995).

Documentation of results in a codified form is as important as the process. Single results from one project can be used as building blocks for other members in the hospital. If the project is successful a transfer of the results within the organization or across organizational boarders will call for documentation (Jensen et al., 2007). OUH has an increased focus on documenting results from projects in their online manual, so that others can read about success and failures and organize projects thereafter.

The success of pathways depends upon a close interaction between the STI-mode of innovation and DUI-mode of innovation. The numbers retrieved from monitoring the normative times must be analyzed, as well as continuously solving the problems that emerge and make tacit knowledge collective. OUH also search for insights from outside sources. By participating in research projects aimed at patient pathways they get access to valuable knowledge about different aspects of the pathways. Results from Jensen et al.’s (2007) survey indicated that organizations that operate in economic activities where scientific and codified knowledge are important also have adopted organizational practices designed to promote knowledge exchange, problem-solving and learning amongst their employees. The main conclusion drawn is that organizations who has a combination of strategies supporting STI-learning and DUI-learning were the most innovative (Jensen et al., 2007). The question of whether this can be transformed to a hospital environment are relevant in this case. Hospitals are knowledge-intensive organizations and are assumed to have strong indicators of STI-learning. OUH has strategies supporting STI-learning put forward by an innovation strategy.
The annual report from Oslo University Hospital Comprehensive Cancer Centre presents innovation highlights for 2017 (2017). 17 disclosures of invention, 4 patent applications, development of different forms of immunotherapy, 617 peer-reviewed publications, 182 active clinical studies, 71 research groups within the cancer area across the divisions, €50 million estimate of research budget, and more are highlighted as major highlights (Oslo University Hospital Cancer Centre, 2017). The following are commonly used to measure STI-learning: expenditures on R&D, employment of personnel with third-level degrees in science or technology, and cooperation with researchers attached to universities or research institutes (Jensen et al., 2007, Salge & Vera 2009, 2013). Even though this thesis did not ask explicitly about these measures, the information retrieved from the report confirms the assumption that OUH has a strong science-push towards innovation and practices the STI-mode of innovation in a high degree. Given the fact that OUH is a knowledge-intensive organization, a big part of their core activity is based on STI-learning. The report does however not write anything about the organizational change that is required or needed in order to generate innovation.

Oslo University Hospital therefore seem to have significant less strategic focus on supporting DUI-learning, given the information retrieved from this study. With the exception of a directive stating that each department has to implement the use of performance blackboards into their daily work activities and support their staff in suggesting improvements, there are no formal strategy for working with continuous improvement. All the participants talked about the importance of collaboration, knowledge-sharing and employee-involvement as crucial factors for incremental innovation processes, such as the implementation of case pathways. One reason for this is because the problems needed to be solved could not be solved by research. This gives an indicator that the conclusion drawn by Jensen et al. (2007) also are applicable to hospitals.
5.3 Barriers for the implementation of case pathways

The case studied in this project is in practice comprised of two different, yet highly intertwined, processes. This being the implementation of case pathways and the improvement of cancer care pathways. Some of the experienced barriers applied to both, while others only applied to each individual process. The perception of barriers also differed between the two groups of informants; clinicians and employees from support functions. The clinicians experienced barriers mainly at micro-level regarding the current state of pathways and the impact it had on the delivery of patient care, primarily concerning issues with capacity, responsibilities, and collaborations. The informants from support functions experienced barriers on a higher level primarily regarding the improvement of the pathways, lack of competences, differences in attitudes, and the organization of the health care system in general. This is somewhat expected, due to the composition of different professional groupings with different tasks and responsibilities at the hospital (Koch & Hauknes, 2005). Previous research has revealed that clinicians tend to reject implementations of systems and processes that lead to a standardization of tasks and relations to others (Degeling, Kennedy & Hill, 2001). In line with this, an assumption is that the clinicians in this project would express resistance towards the implementation of case pathways and also on the use of Lean tools. A further discussion of the distinction between clinicians and administrative staff will be highlighted under the barrier “professional resistance”. This part will sum up the barriers perceived for the implementation of case pathways and the improvement of cancer care pathways. It will be discussed with regards to the literature summed up in table 8.

<table>
<thead>
<tr>
<th>Barriers commonly associated with innovation in health care organizations</th>
<th>Barriers commonly associated with innovation in public sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Size and complexity</td>
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<td>• Public resistance to change</td>
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<td>• Professional resistance</td>
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Table 8: Barriers related to innovation in the public sector in general and health care organizations (Bloch & Bugge, 2013; Cunningham, 2005; Koch & Hauknes, 2005; OECD, 2017; Osborne & Brown, 2013).
5.3.1 Structure of the hospital

In this study, a couple of informants mentioned the size of the hospital as a barrier. However, most of the informants pointed to the complex organizational structure as a barrier rather than the size of the hospital per se. The large amount of people involved complicated the implementation and the effort to embed the new practices as daily work practices. The informants noted that the complexity of the hospital and the traditional organization with silo-organization led to confusion surrounding responsibilities. They acknowledged that several of the challenges they experienced came from the lack of an overarching responsibility and coordination. This was particularly related to problems of sharing information and establishing contact with patients, and the struggle to get an overview of the organization. Neither one department nor clinic had been given the formal authority to oversee the work with case pathways. The overarching mandate was embedded at the top in the Comprehensive Cancer Centre. Because the official mandate was far away from the frontline staff, they felt an absence of responsibility in the process.

Cancer patient pathways are an extremely complicated service, involving multiple departments, clinics and individuals. The large differences in patient cases amplifies the need for coordination. Silo organization makes this challenging, both in terms of delivering services to patients as well as to other departments in the hospital i.e. pathology. While patients move horizontally across the hospital, the communication and management move vertically in silos. For every meeting the patient has during their pathway, there is a new line of management to report to. The informants expressed concern over patients being thrown from one department to another. This problem illustrates that there are still hierarchical principles embedded at the hospital. Informant 2 from the support functions said it was important to remember the focus should be on patients:

*Instead of spending a lot of time trying to figure out who we should report to or who the right person to ask certain questions is, we should all reach an agreement that the patient is the important part and figure out a way to organize accordingly* (support function, informant 2).
Pathway managers are the appointed role which in theory has the formal responsibility for the pathway, but as many informants pointed out, they seem to have an impossible task. Clinician 5 said they have an impossible role: “No one wants the role as a patient pathway manager. It is an impossible role to fill. You have no authority to implement changes, you can only problematize. You call for help but no one is coming” (clinician 5).

Some of the informants related the pathway managers’ management skills to the problems encountered. They noted that physicians often are patient pathway managers, and also that they usually lack management skills and competence on improvement, which thereby problematize the entire structure of pathways. The complexity of the organization and the priority of hospitals, primarily focusing on improving medical care, makes up for fewer resources available for organizing. The responsibilities in the pathways are embedded in different departments, making it complicated to get an overview. The informants said it has been important to focus on clarifying who is responsible for each step in the pathway, and who is the one giving the baton to the next person in charge.

Because each department had to implement the pathways within their own department, it was expected that the size of the hospital did not act as a barrier for the implementation. However, when the improvement processes of the care patient pathways were enforced, the need for coordination and communication across the hospital followed. Initially it is a management task to oversee the improvement of the pathways and ensure that necessary measures are taken. The line management must look for new ways to improve things every day and motivate the hospital staff. However, the informants noted that the line management are overworked and highlighted the need for support from other environments, such as the support functions. The departments are reliant on having support functions to help them with practical and technical problems related to the design of pathways because the clinicians are occupied with patient treatment. The support functions have no formal authority to implement changes, their mandate is to give advice and support. In line with this, the informants from the support functions highlighted the importance to increase the competences and educate the employees on continuous improvement and processes so they could take some of the responsibility.

There has both been a lack of approaches and solutions to this problem and also lack of a clear agreement of the given problem (Cunningham, 2005). While the clinicians mostly reported that it was a management issue, the employees from management and support functions said the
problem was more related to the lack of competences of the pathway managers. Even though the informants considered many people involved as a challenge, they also recognized that these factors are beneficial in that it gives them unique access to resources, supporters and knowledge, even though the resources are dispersed. Clinician 1 stressed the support as a significant value: “we face difficult cases on a regular basis and have more bad days than good days. So, it is nice to have many colleagues for support, it makes up for the potential problem with too many involved” (clinician 1).

This highlight another viewpoint of the structure of hospitals. Even though the size and complexity are known to be a prominent barrier for public organizations, size itself might not be a hinder for innovation in hospitals. Taking the difficult work life hospital staff experience, they seem to value the size and number of people involved, even though it can lead to some issues of coordination during the implementation of new practices, before it is institutionalized as a routine.

5.3.2 Cultural barriers

When the size of the hospital was discussed as a potential problem, it appeared it was the size and culture within the different departments that acted as the actual barrier. One of the biggest cultural barriers was the interaction between departments. Not within departments or between people, but across department lines. The informants expressed a need for an arena for communication and collaboration. The departments are often well-functioning as a single unit, but the fragmented environment hinders coordination, collaboration and innovation across the hospital. The success of pathways is dependent on the involved actors being able to see the whole process as one. Even though one part in the pathway manages to deliver the service within the given time frame, it is the entire pathway that is important for the patient. Informant 5 from the support function stressed the importance of focusing on the actual outcome: “If you get good results in one department or silo, it doesn’t necessary mean that it is good for the patient. We have to accept bad results in silos, if it benefits the user” (support function, informant 5).

Because the pathways move across, the patients have expectations that the people involved in their care are aware of what has been done before and after the patient was transferred to another department. Informant 4 from the support functions stated there is a need to “take the
blindfolds off and see things from the patient’s perspective”. Building a new culture and changing the existing ways are time-consuming and challenging. Some of the informants highlighted that changing attitudes, routines and competences are a difficult task. Informant 5 said the differences in attitudes complicated problems:

> What can be thought of as world problems in one silo can actually just be a small problem seen from a holistic perspective. You fall in love with your own point of view, right. And breaking out of that is hard (support function, informant 5).

Informant 4 from the support functions reported that there is a lot of made up variations and predetermined attitudes because everyone thinks they know what the problem is, and act accordingly. But in reality, the problem might be something entirely different. When there is a lack of dialogue as the informants reported, the problems are not solved. These differences in attitudes towards development might cause a stagnation in some of the pathways and progression in others. Communication and collaboration between departments is an apparent necessity when these situations occur. Informant 5 from the support functions pointed out that the solution is not to buy more machines. The hospital must “dive into the core, the culture and work with the people” (support function, informant 5).

When challenges associated with the improvement process were discussed, clinician 2 noted that there is a fine line between “never changing a winning team” and the need to always improve. The work with improvement is neither a systematized nor a formalized process at OUH. It varies from department to department and pathway to pathway how they work with improvement. The high degree of heritage and “silo-mentalities” in the departments influence the attitude toward changing their own practice (Cunningham, 2005). Some have a desire to constantly improve, while others only change when given the order to. Clinician 5 highlighted that motivation and engagement was the key. This informant told from experience that the staff needs to see that the work is valuable. This entails the development of a collaborative culture, open culture, and improvement culture.

The issues of size and the departments was also echoed by Koch and Hauknes (2005, p. 40) who indicated that hospital departments are large organizations on its own, with their own legacy, culture and their own communities of “how we do things here”. Such culture can impact
innovation in that new ideas often are discouraged. This also counts for the hospitals OUH comprises of. The heritage of the hospitals still affects the way the hospitals work. This makes it difficult to implement hospital-wide changes that affect several departments and require them to collaborate, such as case pathways.

The lack of a culture for collaboration and an overarching responsibility could also relate to growing risk aversion. Innovation is rarely isolated and depends upon further changes which may cause unpredicted consequences. This illustrates the nature of case pathways, where changes are required across the entire hospital. The innovation may lead to improvement in one part of the system and in a shift of the problem to another part. If one department implements several measures to improve their processes, it may lead to an increased workload in another department. The lack of a dialogue between the actors may hinder the diffusion of the good practices and a possible solution for such ripple-effects. It can rather lead to risk aversion for change because they are unaware of the possible consequences it can have for others involved and uncertain of who it is that has the responsibility.

5.3.3 Differences in attitudes

In this study, conflict of interests between the medical profession and management values showed to be the most prominent cultural barrier. For clinicians, the professional aspect, including clinical work and patient care, will always be the number one priority. The managers, or other administrative staff at the hospital, are therefore responsible for other organizational aspects, such as finance, organization and implementing changes. For clinicians, “administrative work” is a “waste of time” because it takes time away from patient treatment. Clinician 1 noted one must consider organization as an important part of patient care: “patient care is about more than just medical quality, it is important that the process is organized well and are exercised according to given principles. Process and medicine equal better patient care” (clinician 1).

The informants from the support functions told there were many clinicians that had expressed frustration over systems that were not working and the amount of problems they experienced related to i.e. communication across hospitals. However, the reluctance towards suggestions or solutions initiated top-down affected the improvement of these problems. Informant 5 and
clinician 5 highlighted the importance of making clinicians prioritize improvement as well as patient care. Informant 5 expressed the following:

*We need to make the clinicians realize that they are a part of a system and an organization where everyone has to contribute to make things better. Everyone working within the healthcare system have two jobs: the medical responsibility and the responsibility to improve healthcare services* (support functions, informant 5).

Several other informants agreed with this and stressed that it should not be either or for clinicians. Adopting management values and focusing more on developing services does not have to go on the expense of patient care. Clinician 5 noted that is it has to become attractive for a clinician to become a good leader. Clinician 1 shared the same view. This informant expressed that everyone at the hospital are a part of an organization where certain rules and norms apply. Other important tasks, in addition to patient treatment, must also be done.

The overall resistance showed not to be about the actual implementation of case pathways, but for the further improvement process of care pathways and the pressure to reach the goals set by the normative times. It is not surprising that the clinicians showed support for the idea of the pathways given that the initiation came from a need of the patients. It is also not surprising that the resistance was towards the monitoring and the measurement aspect. Rationalizing and standardizing the work of clinicians is often perceived as a threat on the autonomy and individualism that they value. Clinician 1 expressed that it is difficult to be evaluated based on numbers:

*With the standardization of the waiting times in the pathway and the monitoring and “red numbers” that are reported if we don’t manage to deliver the service within these days makes the work even harder for my employees. We have tough days enough as it is, and the constant pressure to not get red numbers just make it worse. It is essential not to forget that it is the patient that is the most important* (clinician 1).
The use of performance indicators spurred the motivation in the management/support functions, while the clinicians had an ambivalent relation to it. The goals of improvement vary between the groups. While the employees from the support functions considered waiting time and efficiency to be the goals, the clinicians considered the goals to be improvement of patient treatment. A concern among the clinicians was that the adoption of management values would undermine the medical values. Informant 5 from the support functions seemed to share this concern when talking about the focus dominating the improvement processes:

*The days only looks good on paper. We need to ask ourselves the question about whether the ability to deliver the service within the defined number of days betters the service, or if it just looks good on paper? We should focus on improving the processes that actually matters for the patients* (support functions, informant 5).

Clinicians take great pride in their work, valuing the significance they make for patients. At the hospital, the medical staff has loyalty downwards to the patient, not upwards to the management, contradicting hospital organizations to public organizations which entails an obedience to higher levels of authority (OECD, 2017). Balancing this loyalty has proved to be difficult when trying to implement a change top-down, because the clinicians are more focused on patient treatment than actually to participate in change processes. Cunningham (2005) described professional resistance in the form of medical professionals’ reluctance to lose medical autonomy, unwillingness to engage with stakeholders and accept ideas of others. These problems were notable in this case, but the overall professional resistance looked somewhat different. The resistance in this study was mainly embedded in differences in attitudes between clinicians and employees from support functions. These groupings have different tasks and competences which can lead to conflict of interest and trust issues (Strand, 2007).

It was particularly the informants from the support functions that highlighted this barrier. Managers and people upholding administrative positions often have clinical backgrounds, which also was the case for every participant from the support functions in this study. The informants from the support functions expressed that their clinical background had proven to be very valuable when working on changes at the hospital. They had preconditions to know what the clinicians would find difficult and what it was important to focus on when trying to
persuade them to support the innovation process. The professional relationship between the two groups are therefore somewhat paradoxically given that the groups are pretty similar in education and background. It can therefore be questioned why conflicting attitudes arise between the two. One possible reason is that when clinicians take on management roles, new rules and demands apply and they must let go of the loyalty towards the patients (Strand, 2007). However, an interesting observation was that the conflict of interests was not prominent between the clinicians and the administrative staff included in this project. A possible reason for this is that the clinicians included in this project all uphold management positions at the hospital and had been involved in the implemented change from the beginning. They had ownership to the new process and seemed determined for further developing the pathways. Previous research notes that clinicians with management responsibilities have a more positive attitude towards changes than physicians (Degeling et al., 2001; Martinussen & Magnussen, 2011). The problems associated with resistance from the clinicians is therefore not directly directed towards the clinicians included in this project, but the overall impression of the experienced resistance from physicians at the hospital. The only conflict of interests between the particular informants in this study was in relation to participating in improvement processes and the new performance measures.

The findings related to professional resistance are complex. They are not consistent with the previous assumption that clinicians would express reluctance towards the innovation and that the employees from the support functions would be exclusively supportive. The reality is not that black and white, showing that clinical managers and support functions share many of the same concerns and experience the same challenges. The findings do however show consistency with what research has discovered about the conflict of interests between clinicians and managers, that being both clinical managers and ancillary staff, towards a change that standardize the work (Degeling et al., 2001; Martinussen & Magnussen, 2011). The purpose of giving the patients a safer and more predictable experience during their course of treatment was to a large degree supported, but the monitoring of the efficiency of the care process was resisted. This shows that change is not straightforward, and that there are different aspects relevant to examine when dealing with resistance of innovations.
5.3.4 The pace of the change and absence of resources

The process of standardizing cancer pathways includes standardizing roles, documentation, methods, responsibilities, reports and arenas. The complexity of the hospital and the tasks complicates this process. Every cancer treatment is different. Every patient is different and represents a new case. And, every cancer treatment is different within each case. The process is not like manufacturing a bar of chocolate, or a car. Every pathway needs to be customized, yet still standardized. Informant 5 from the support functions expressed that a significant problem was that the pathways had been implemented before local adjustments were made:

A problem is that the service [case pathways] just have been implemented as is, without reorganizing the tasks in a “smarter way” or adjusting it to fit the structure, culture or working practices at the hospital. The case pathways have had a narrow focus, primarily focusing on the measuring points. (...) When you have two measuring points, this will automatically become the focus. But something is happening before and after these points that will have an effect on what is happening between the two measuring points. Every pathway will affect each other. It is important to focus on the whole pathway (support function, informant 5).

A prominent barrier was therefore a result of the focus on implementing new technologies and processes, instead of cleaning up “the mess of the existing practices”. The informants reported that they had been struggling with the new procedures following the case pathways. There had not been established functional work practices regarding the technical sides to pathways such as documentation, illustration and coding. The coding system is different for case pathways and cancer care pathways, which could have major effects, especially for the measurement of pathways. There was also a lack of one particular methodology to follow for illustrating and documenting the pathways. This led to many variations in the descriptions and presentations of pathways and complicated collaborations with other departments. Informant 1 from the support functions noted that a lot of these variations was a result of a difficult starting point because there was not one specific methodology the departments were told to apply:
Everyone was told to just do it. There was many involved and lots of decisions to be made, so everyone was in great need of some guidelines and a methodology to follow. We needed a clear direction put forward by the management (support function, informant 1).

There is an existing efficiency paradox in pathways: when the hospital make time for more patients in the pathways, the more inquiries for information, e.g. phone calls from patients stating that they should have gotten an appointment. This leads to a higher work load which might had been avoided with a regular patient flow. The internal capacity, particularly in radiology, was highlighted as an administrative challenge. Radiology have a continuous flow of patients, not only cancer patients, and struggles to prioritize patients. Informant 2 from the support functions said: “when a patient in a cancer pathway is not scheduled to an appointment when needed, the normative times are not reached, and the pathways are considered a “fail” before even making it to the second measuring point” (support functions, informant 2).

As mentioned under the barrier “structure”, the departments were reliant on getting help from the support functions in both the implementation process and the improvement process because of limited capacity. Many of the clinicians reported that they had worked with one or more of the support functions, others knew of them, but clinician 6 was not aware of their existence at all. This is a prime example illustrating the complexity of the hospital and lack of communication raising awareness of the support functions. None of the informants reported the lack of support services as a barrier. The growth of support functions is commonly known to be a driver for innovation (Koch & Hauknes, 2005). In this study, the departments delivering ancillary services are labeled as support functions. However, in research, the growth of support functions relates to structures and systems designed to promote, stimulate or disseminate innovation, such as staff suggestions boxes, competence building and staff fora (Cunningham, 2005). Needless to say, these practices have worked as a driver for improvement, and are thus in line with the research.

Other than lack of capacity, the access to resources such as financial support, skills and support services may be limited for innovation at hospital (Koch & Hauknes, 2005). Because incremental innovations rarely are considered as innovation when it comes to funding, it makes
it hard for organizations to invest in these changes. The lack of a strategic focus on incremental innovations also limits the access to resources. As shown in section 5.2.3, STI-innovation is in the center of attention at the hospital when it comes to providing resources and investments. Another significant financial problem is that the departments and hospital lose funding when patient efficiency improves. The budgets and funding are reserved to the departments, while the patient moves across in the pathways. If the goals in the pathways are achieved, and the hospital discharges patients quickly, it results in less income for the hospital, because hospitals are funded per “patient day”. However, faster discharges are a huge benefit for the society and the patients. A variable budgeting structure that allows for greater operational flexibility is an important support mechanism for the further development of case pathways (OECD, 2017). This is of great importance for the possibility of developing pathways further.

Although the public sector must redesign how it delivers, it also has an obligation to ensure continuity of service. Governments cannot shut down existing hospitals while working on changing practices: “they need to change a tire while driving the care” (OECD, 2017, p.17). Sustaining innovation practices must be maintained while investing in new innovations. Many of the participants noted that there were limited time resources available to prepare and implement the changes required for the new case pathways procedures (Cunningham, 2015).

5.3.5 Absence of capacity for organizational learning

The lack of process competences of clinicians and ability to keep the momentum in improvement processes acted as hinders for developing a capacity for organizational learning. The implementation of case pathways represented a major change in that the employees were expected to accept the shift from a functional orientation to a process orientation. Several informants from the support functions emphasized that the clinicians have the medical knowledge but need the knowledge of putting procedures and care processes into a logic system. Informant 1 from the support functions expressed that a lot of time is used to document, rather than actually to improve the practices: “it is essential to actually improve the delivery of care, not just to document the current practice” (support function, informant 1). This was seen as a particular problem caused by the lack of process management and of competences on improvement. Clinician 5 stated that: “the lack of competences about improvement and processes is serious. Everyone needs to get on board with this mindset. The barrier clinicians have to learn new things has to disappear” (clinician 5).
Informant 1 and 2 from the support functions noted that a prominent barrier has been to maintain the focus on improvement and get everyone on board with the process system. The informants noted that hospital staff might overthink and complicate changes and innovation, because they seem to give up before they have even tried. Informant 5 from the support functions said: “the clinicians think the hospital is too complex and that it is impossible to make a difference. But they need to understand that minor initiatives also can make a big difference”. They also discussed the challenge of organizing the improvement of pathways as projects. This has made it difficult to maintain momentum and keep the clinicians motivated to continue the work with improvements. Informant 2 noted that when something else caught the attention, it was hard to maintain the good flow: “[With this project], we experienced a Hawthorne effect. Everyone fell back into old patterns as soon as the spotlight disappeared. It shows the importance of maintaining focus and have someone that acts as the driving force” (support function, informant 2).

A common barrier associated with involvement and participation in sustained incremental improvement are lack of skills in innovation among non-specialists (Bessant & Caffyn, 1997). This barrier might emerge from a lack of understanding of the concept of continuous improvement and organizational skills and will to implement it. A reoccurring problem are often that the enthusiasm is higher than the level of skills (Bessant & Caffyn, 1997). This also seems to be the case at Oslo University Hospital. Several projects are initiated where enthusiastic facilitators are in charge. Inputs from specialists are often critical for the success but there are usually limitations in the capacity they have to participate in all the problem-solving activities involved (Bessant & Caffyn, 1997). When the project ends, the momentum and specialists are gone, and the lack of skills of the clinicians “on the floor” stops the process from moving forward. A possible reason for the problem of maintaining momentum is that the initiatives for the projects were initiated top-down. Given the analysis and discussions of clinician’s possible reluctance to suggestions and directives initiated top-down, this can also act as a hinder for getting the clinicians on board and continue the work on improvement after a project has ended. This shows the importance of investing in resources to embed and institutionalize new routines and procedures in the departments. Of particular importance in this case is the need to exhibit flexibility and work actively on the identification of further opportunities (Cunningham, 2005). A large part of hospitals’ innovations is developed through problem-solving in daily practices (Salge & Vera, 2009). As Koch and Hauknes stated (2005,
p. 9) “for an innovation to be successful, it must be understood and accepted by people, and in order for that to happen, learning must take place”.

5.3.6 Summary of barriers

The presented barriers paint a picture of how complex and challenging it is to implement changes in hospital. As for the implementation, the more structural and organizational barriers were dominant. In the case of improvement, the lack of a collaborative culture, competences and learning were more prominent. Table 9 gives an overview of the barriers presented in the literature with the barriers experienced in this case.

<table>
<thead>
<tr>
<th>Barriers commonly associated with innovation in health care organizations</th>
<th>Barriers commonly associated with innovation in public sector</th>
<th>Barriers related to this particular case of innovation at Oslo University Hospital</th>
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</thead>
<tbody>
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<td>• Complexity</td>
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<tr>
<td>• Heritage and legacy</td>
<td>• Lack of incentives</td>
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<td>• Need for consultation, unsure outcomes</td>
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<tr>
<td>• Absence of resources</td>
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<td>• Pace of change</td>
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<tr>
<td>• Public resistance to change</td>
<td></td>
<td>• Lack of specific guidelines</td>
</tr>
<tr>
<td>• Professional resistance</td>
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<td>• Lack of capacity and financial resources</td>
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</table>

Table 9: Barriers related to innovation in public sector and to this particular case.

This chapter has tied structural factors and individual factors together by presenting how the informants have been affected by certain structural factors in an implementation- and improvement process. For instance, the silo-organization and complexity of both the pathways and the hospital acted as a hinder for interaction and collaboration across departments. The complexity was also reported to be a barrier for the motivation of clinicians. Because they experienced the hospital as a large and complex system, it had led them to believe that it was impossible for them to contribute in changing the current ways of practice.

In summary, the barriers experienced by the informants is argued to be in line with what existing literature states are the common barriers for innovation in the public sector, and particularly health sector. Regardless, there are some barriers experienced in this case that are not stated in the literature. An interesting finding in this study was that the professional resistance showed not to be determined by the positions, being clinicians and administrative
staff/managers. There was rather a diversity in attitudes across the groups, where clinicians and employees from the support functions shared many of the same concerns and had many similar opinions towards the attitude of other physicians at the hospital. This gives a more nuanced picture to the predetermined assumption that clinicians will show more resistance, and managers/administrative staff will be more motivated in innovation processes (Cunningham, 2005; Degeling et al., 2001; Maroto & Rubalcaba, 2007; Martinussen & Magnussen, 2011).

Another interesting, somewhat surprising, finding was that the majority of participants reported that the size of the organization was not a barrier (Cunningham, 2005; Koch & Hauknes, 2005; Osborne & Brown, 2013). They did recognize that the complexity of the hospital led to some hinders of coordination and responsibilities, but argued that the access to resources, knowledge and supportive colleagues made up for this barrier. This viewpoint expands the existing literature on barriers on innovation in hospitals to some extent. It serves as an additional aspect of the complexity of hospitals, as a convenience rather than an inconvenience.

A third finding deserving of some attention is the lack of resources in incremental innovation processes. It seems to have been a strict focus on the STI-mode of innovation and providing patient treatment. Less focus has therefore been devoted to the complexity of organizations and how other practices, like incremental learning activities, might be of value to overcome some of the barriers experienced by the hospital staff. Even though the case pathways served a recipe for a more standardized way of delivering care for cancer patients, there are still large variations to be found.
5.4 Future organization of cancer treatment

Pathways can possibly lead to a more efficient organization of care processes, which is important due to the expected future increase in cancer patients. It allows hospitals to standardize paths of patient flows and also measure the times in each group of patients. This section will provide some insights in how pathways have influenced the care processes and the employees affected by the new approach. This will help getting an understanding of the effects of pathways, and whether it can be considered a beneficial way to organize care processes.

5.4.1 New incentives

The new performance measure following the introduction of case pathways sought to provide different incentives for health professionals to streamline the delivery of care and increase the focus on improving the service aspect. But as noted earlier, the funding schemes of the hospital can act as a prevention for the inventive to be more efficient. Regardless of the financial barrier, the pathways are evaluated based on the new performance measure which involved ongoing monitoring processes of the waiting times for patients. This would hence act as an incentive to comply the normative times. Case pathways is the first government-led initiative that challenged the current silo-organization of health care organizations. The new way to organize the care processes horizontally in the hospital prompted structural changes in the vertical silos. New roles and functions were introduced, such as pathway coordinators and multidisciplinary teams which were to facilitate the new way of coordinating the process. A reorganization of the service was also initiated with new work practices such as monitoring and documentation. Both clinicians and employees from the support functions pointed out that even though the new focus on “thinking in times” did not represent a major change, it urged a behavioral change of the hospital staff. They had to adjust to reduce the discretions in the care process, which resulted in a pressure to make smaller changes so they could comply with the normative times. Informant 2 from the support functions expressed it like this:

There is a difference between change and awareness – it is not a change to be aware of the number of days the patients have to wait between the different phases in the care process. Continuous improvement is not about registration of days, it is a tool used to change the reason for the wait. (support function, informant 2).
The informants meant that another incentive was that well-functional cancer patient pathways are essential for the fulfilment of the purpose of case pathways, to deliver the service within the normative times. Because case pathways in practice only represents the normative times, it is the cancer patient pathways that concretize and operationalize the different steps in patient care, both in terms of responsibilities and task description. Cancer patient pathways was described by clinician 2 as a way of embodying case pathways: “case pathways are basic and serves as a ground pillar for the cancer patient pathways. To be able to give good patient care, the coordination, quality and flow in these steps has to work optimally” (clinician 2). Because it was a limited number of tumor groups that had established cancer patient pathways, the implementation of case pathways led to an increased focus for further development. One of the most important strategic measures put forward by the Comprehensive Cancer Centre is to “develop standardized pathways for all cancer patient groups” (OUH CCC, 2017). In addition, the hospital is still under pressure from the government to improve the pathways. Informant 2 from the support functions said the political drive have both inspired and created commitment to pathways: “the influence he has had on the hospital has been crucial. Every hospital needs their own Bent Høie, someone has to be as committed and as dedicated to prioritize the work with pathways” (support function, informant 2). Both the political and strategic commitment to further develop standardized pathways for all cancer patient groups shows the legitimacy this approach has as a way of organizing cancer treatment.

5.4.2 Outcomes of pathways

Each pathway had their own impacts and consequences for organizational structures, collaboration and procedures. Clinician 5 noted that everything works in a given context, but since the context differs, the pathways will affect different processes. For the clinicians related to a pathway that had institutionalized the new practice, increased learning and knowledge sharing was experienced as effects of the case pathway. A special emphasize was on the impact the multidisciplinary team meetings had. These meetings were expressed as a significant opportunity for learning, because other hospitals could join the meetings and participate in, or just listen to, discussions about different patient cases. The case pathways forced the different departments and hospitals involved in one patient’s care process to communicate and coordinate. This led to synergies where one problem solved often solved several others. The multidisciplinary team meetings gathered everyone involved around the same table, which
proved to be very valuable. Any predetermined attitude or belief was laid to rest and disagreements turned into agreements. Clinician 5 explained that the collaboration between two of the hospitals got much better because the employees at the respective hospitals were forced to talk to each other. Collaboration, communication and coordination do however entail continuous work. Participants from the support functions have observed that there are more discussions, workshops and mapping of processes after cancer patient pathways were initiated.

Other positive outcomes of pathways have been that the patient was put in center of care, with the purpose of creating a holistic service that gives the patients a predictable and safe care process. A benefit of this is that waiting time is systemized, resulting in patients receiving answers faster and the hospitals have time for more patients. When the protocols are standardized, a more professional patient contact is established. Informant 1 from the support functions said that: “before some departments called the patients, some sent a letter and others just called the patient’s physician. Now there is a specific protocol for when patients should be contacted, and how the message should be delivered” (support function, informant 1). The standardization of processes, e.g. how to take MRIs, have had a significant effect in both efficiency and quality. The overall quality of patient care will improve when processes are more efficient.

5.4.3 Implemented changes

The level of change the participants experienced as a result of the implementation of case pathways varied with the department they work in, within which case pathway, and if the tumor groups had developed functionally cancer patient pathways before the implementation. Clinician 1 and 2 said the associated cancer patient pathway had always been organized structurally and multidisciplinary and only needed to formalize waiting times. Nevertheless, due to the pressure to meet the predefined number of days, a lot of changes had to be enforced. Employees mainly initiated these changes. They suggested different solutions and saw potential in small changes. Clinicians from other pathways also reported that several changes they had enforced. Some as a direct result of the implementation of case pathways, others as measures taken for improving the cancer patient pathways and the service delivery. Table 10 shows an overview of a number of changes the participants thought of as a response to the pathway.
<table>
<thead>
<tr>
<th>Changes</th>
<th>Reason</th>
<th>Solution/outcome</th>
<th>Direct result or improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructing cancer patient pathway regionally</td>
<td>Need/suggestion: the treatment of the cancer involves several hospitals in the South-East region.</td>
<td>The pathway management group recognized it would be pointless to construct the pathway locally. Proposed an entirely new way of organizing pathways by including several hospitals in the process.</td>
<td>Direct result (organizational and service)</td>
</tr>
<tr>
<td>Reorganization of polyclinic</td>
<td>Problem: Lack of resources for the first day of the case pathway</td>
<td>Isolated resources for when several meetings scheduled by distributing tasks and restructure responsibilities</td>
<td>Direct result of case pathways (organizational)</td>
</tr>
<tr>
<td>Patient coordinators joined the polyclinic</td>
<td>Suggestion: The coordinators establishes the first contact with patients and should also be the first one they meet.</td>
<td>Moved working hours for the nurses from department to clinic. Nurses gained motivation and polyclinic economic gains.</td>
<td>Direct result of case pathways (service)</td>
</tr>
<tr>
<td>Inserting a “live” document in electronic patient journals</td>
<td>Problem: Lack of information and coordination between the different health care organizations patients receive treatment at.</td>
<td>Developed a “living” document in patient journals, meaning that one could see when the information was submitted, dates of different examinations and procedures. Everyone involved will have the necessary information available, Results in better decisions because of more point of views and suggestions.</td>
<td>Direct result of case pathways (organizational)</td>
</tr>
<tr>
<td>New checklists for referrals</td>
<td>Problem: Large variations and lack of information in referrals.</td>
<td>Designing a checklist for referrals to make sure the process is conducted in the same way. All the involved parts who sends referrals to the hospital were to receive it. The checklists include the necessary information and whom the information should be sent to.</td>
<td>Direct result of case pathways (organizational)</td>
</tr>
<tr>
<td>Aftercare polyclinic for follow-up controls</td>
<td>Suggestion: A need for an offer of services for postoperative care was discovered through a research project. The suggestion to develop a new polyclinic came from the nurses.</td>
<td>Gives the hospital feedback on the care received through the pathways and are valuable for patients.</td>
<td>(Service) Improvement measure</td>
</tr>
</tbody>
</table>
### Table 10: A selection of changes as a result of the implementation of case pathways.

<table>
<thead>
<tr>
<th>Change Type</th>
<th>Suggestion</th>
<th>Implemented Action</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation of patient blackboards</td>
<td>Suggestion: Utilizing patient resources.</td>
<td>Involving patients to take charge and participate in their own course of treatment.</td>
<td>(Organizational) Improvement measure</td>
</tr>
<tr>
<td>Employee appraisals</td>
<td>Suggestion: Make the hospital staff feel special and a part of an organization that are interested in the employees’ input.</td>
<td>Increase the motivation gives the manager an overview of existing resources. Gives an indication of who aspires to go the extra mile and join different projects.</td>
<td>(Organizational) Improvement measure</td>
</tr>
<tr>
<td>Video MDT-meetings</td>
<td>Suggestion: Ensure the best evaluation possible for patients (Oslo University Hospital Cancer Centre, 2017)</td>
<td>Started up MDT-meetings for regional patients referred to OUH, including specialists from other hospitals. Meetings were facilitated with new three-channel video technology. All hospitals in the south-east health region installed this technology during 2017.</td>
<td>(Service) Direct result of case pathways</td>
</tr>
</tbody>
</table>

There is a broad spectrum of changes implemented, ranging from minor organizational changes affecting the hospital staff to major service changes affecting patients and the hospital. Based on research, the pathways were believed to have a positive relationship in the case of service quality ranking and on return on income and resources per bed, given that the purpose is to give the patients the necessary care efficiently (Salge & Vera, 2009). These factors are shown to be the common benefits from DUI-innovativeness (Salge & Vera, 2009; Salge, 2012). Pathways were also assumed to be of importance for patient satisfaction, where one goal is to make the patients experience the journey as a coherent, predictable and safe process. However, patient satisfaction is a positive outcome related to STI innovativeness (Salge & Vera, 2009; Salge, 2012). This study did not measure patient satisfaction, so there can not be drawn a conclusion if pathways has led to more satisfied patients. Regardless, one can point to an interesting observation that successful pathways are an outcome of a strengthening of the DUI-mode.

All the changes presented were initiated bottom-up by the employees on “the floor”, as a response to a top-down initiated innovation process. Informants reported that employees’ openness to ideas and willingness to think “outside the box” was important for solving and identifying problems (Cunningham, 2005; Albury, 2005). The key personnel were in this case “champions” that had the determination to push the innovation process, i.e. the clinician 1 who
actively approached decision makers to influence or get access to resources. This was motivating for the involved staff members and for their ability to affect change and actually implement the ideas. The informants said they experience less resistance now because the hospital staff have seen how it helps and that processes actually are improved. This has increased the motivation and a desire to work with improving the service. It shows the importance of sharing knowledge and experiences across departments and hospitals. As clinician 5 noted: “people need to hear the good stories”. The wealth of these innovations, generated by medical, nursing and managerial staff, rarely makes it to the surface of public and scholarly attention (Jensen et al., 2007; Salge & Vera, 2009, 2013). These innovations can thus be conceptualized as “hidden innovations”. This study therefore seeks to highlight such changes and show that the importance of the frontline staff plays an important role at a hospital.

5.4.4 The pathway innovation process?

Can we by the discussion provided so far compare a cancer patient pathway with an innovation process? Similar to the traditional view of the innovation process as a linear process, the process for cancer treatment has been considered an a-z process. However, as earlier discussed, the patient pathway looks different for each patient, and the pathway must be customized to every given patient. There is thus not a “one process fits all”, and similarly with innovation, not a linear process (Kline & Rosenberg, 1986; Van de Ven et al., 2008). Tumors appear at different places in the body and develops differently from patients to patient. Some patients may need additional treatment, some patients may fall out of the pathway, while others might follow a more traditional path. The point to be made is that it is not a predetermined set of actions that one can presume to follow. The most important innovation process in a hospital is about getting the patients through the system in the best possible way. The goal is that this process will be safe and predictable for the patients, but also that it happens as fast and efficient as possible with a high degree of success.

A pathway is a predefined path for a cancer treatment and is thus also not a linear process. Within each pathway multiple processes happen simultaneously. Cancer patient pathways are patient-centered, process-oriented, and an evidence-based approach, which involve major changes in the care chain. Cancer treatment requires close interaction between all involved parts. One could therefore argue that the process should be considered as a system-based practice where the DUI-mode of innovation framework is highly applicable (Bloch & Bugge,
Hospital staff need to understand how to use the system to improve the quality and safety of care processes and how to improve the systems (Johnson, Miller & Horowitz, 2008). High quality cancer treatment requires competences on medical knowledge, patient care, practice-based learning and improvement, communication, and collaboration to mention some. It is important that hospital workers acknowledge that patient care is a part of a bigger system and that by improving the system, patient care is eventually improved. Essentially, improving the organization of cancer treatment is about what you do, what you use and how you interact.
6 Concluding remarks

The current study has explored three specific research questions with the purpose of providing an answer to the overarching research question: “how can hospitals best organize cancer treatment to deal with future societal challenges?”. This chapter will tie the findings from the research questions together. First, it provides a brief summary of the specific research questions, before a discussion of the overarching question. Further, implications of the study will be followed by reflections of the limitations. The chapter ends with presenting suggestions for further research.

6.1 Summarizing the research questions

The first research question, “how does Oslo University Hospital organize innovation and improvement projects?”, revealed that the Network for Continuous Improvement have the responsibility for improvement projects and the Innovation Department for innovation projects. Improvement projects are organized after Lean principles with an emphasis on reducing waste and bottlenecks in a given process. This distinction also reflected the perception the informants had of innovation. Clinicians interpreted innovation in relation to research and medical aspects, and the administrative employees considered innovation to involve both small and big changes related to improvements. Lean and innovation was considered as complimentary, and the use of Lean tools with incremental learning practices were shown to be positive for generating novel changes and improvements of cancer care pathways. The results underline that innovation at hospitals implies an intensive organizational development effort.

The second research question, “how does Oslo University Hospital foster incremental learning?”, highlighted that there is a high degree of incremental learning practices conducted at the hospital. The use of suggestion blackboards, multidisciplinary team meetings and involvement in change processes generated incremental learning. The care processes had for a long time been characterized by tacit and discretionary procedures without a formal structure. The case pathways and cancer patient pathways were a way of making tacit knowledge tangible by formalizing and standardizing the associated processes.
In the discussion of the third research question, “what are the perceived barriers for the implementation of case pathways and the further development of care pathways at Oslo University Hospital?”, it was highlighted that complexity, culture, attitude differences, pace of change and absence of capacity for organizational learning was the prominent barriers. An interesting finding is that the discussed barriers was mostly associated with the improvement process of cancer patient pathways, and not the implementation of case pathways per se.

**6.2 Discussion of the overarching research question**

The overarching research question in this study sounded: “how can hospitals best organize cancer treatment to deal with future societal challenges?”. This research question is both a broad and also an impossible question to answer with the scope of a master’s thesis. The purpose is rather to provide some insights of how the organization of care processes as cancer patient pathways have been carried out. A central finding is that case pathways introduced a different performance measure in the hospital that provided new incentives to focus on the service aspect of care processes. It also required organizational changes. The focus on reaching the goals of the normative times have been challenging for some, while others have been motivated. It was articulated that crucial factors for the success of pathways were collaboration, creating ownership, learning and involvement. These factors will not be stimulated with the reduction of waste and specific bottlenecks using Lean tools. In order to solve problems long-term a change in the structures around the pathways are needed. Routines related to DUI-learning should be institutionalized. This calls for increased management attention on the importance of incremental organizational practices.

This study of case pathways has illustrated how knowledge sharing and learning can lead to successful outcomes, and highlighted the importance of collaboration between organizations, actors and nations. The overview of implemented changes shown in table 10 illustrates that practices such as suggestion blackboards, multidisciplinary team meetings and employee-involvement have positive effect on the generation of innovations and improvements for the pathways. A possible conclusion from this is that cancer treatment processes can be considered as an innovation process. This argues that the DUI-mode of innovation framework and innovation literature on incremental learning are suitable for analyzing patient treatment processes in hospitals.
6.3 Implications and limitations

This thesis has contributed to new insights about hospital innovation. The emphasis has been on how the hospital fosters incremental learning and which barriers they experienced in an implementation process, as well as with improving existing processes and procedures within cancer patient pathways. The research conducted has implications for both theory and practice.

6.3.1 Theoretical implications

This thesis has attempted to fill a void in innovation studies regarding organizational innovation processes in hospitals. It has done so by carrying out in-depth research on incremental organizational innovation processes in a large hospital. This case has illustrated the importance of interaction between tacit and codified knowledge. For innovation studies, this thesis provides an increased understanding of the DUI mode of innovation – particularly continuous problem solving, interaction and involvement of employees - in a hospital setting. The findings show the crucial importance of sound collaboration for incremental learning in a hospital environment. In addition, findings show that it may be possible to identify additional positive effects for hospital innovativeness practicing the DUI-mode of learning and innovation. The findings showed that the use of practices related to the DUI-mode of innovation and incremental learning led to positive outcomes for both the generation of novelty and implementation of innovative solutions related to cancer patient pathways (Thune & Mina, 2016). With that said, this study has demonstrated that daily work practices can be used to report ideas for improvement and organizational change. Another outcome of this study is the possibility to consider cancer treatment and patient pathways as innovation processes, conducted informally in day-to-day work practices.

To sum up, the study can be assumed to provide valuable insights to research on innovation in hospitals along three levels. First, the study ties structural factors and individual factors together. It provides insights about how common characteristics of hospitals, such as culture, professional groupings and complexity, may inhibit innovative behavior of the hospital staff. The second level is the organizational level. Here, it shows how the hospital fosters innovative activities, related to doing, using and interacting mode of innovation. Lastly, the study provides insights on a system-level, by viewing an implementation process and the generation of innovation as a simultaneous process, similarly to the systemic characteristics of the innovation process.
6.3.2 Practical implications

The practical implications in this study apply to three levels: the micro-level, meso-level and macro-level. The micro-level represents the hospital staff, or more broadly health care professionals. The study has provided learning opportunities by giving insights of the prominent barriers in the implementation and improvement processes of case pathways and cancer care pathways. The findings imply a need for clinicians to take ownership in improving the pathways. This is highlighted as crucial for the success. In addition, it has also been highlighted how to overcome some of these, which will be of interest to the meso-level, here representing the hospital management at OUH or other hospitals. They have been provided with insights they should take into account when forming strategies or implementing changes to solve these barriers. Of particular importance is formalizing responsibilities, involving employees and encouraging them to report problems and ideas, and enhancing collaboration across departments and hospitals. Lastly, the study has implications for a broader set of actors, namely government institutions, health care organizations, and innovation scholars in health care. The problem of funding schemes that was revealed is a political issue to address. In addition, the potentials of practice-based innovativeness should be emphasized when forming policies of innovation in health care. Implications for innovation scholars in health care is to devote greater attention to the relationship between Lean, continuous improvement and innovation, and broaden the horizon of organizational innovation in hospitals.

Organizing cancer treatment using a standardized pathway-approach appears to be suitable. Despite certain barriers and challenges, the pathway-approach seem to have led to positive outcomes for the organization and possibly also for the patients. However, to transfer the approach to all medical treatments might not be possible. The Directorate of Health and Oslo University Hospital are currently working on implementing case pathways for mental health, which will meet other and perhaps greater challenges when it comes to standardizing the treatment process.
6.3.3 Limitations of the study

This thesis is not flawless and comes with a number of limitations. First, this study only included eleven informants from a single university hospital that employees over 23,000 people. This causes limitations both for the applicability of the findings to other contexts and to the specific hospital studied. It would be ideal to include clinicians from several pathways. This would contribute to a greater understanding of the underlying practices of the work with pathways and how the hospital work with incremental learning. In addition, it could reveal whether the observed findings fluctuated among the departments, employees and type of expertise, and if the perceptions of innovation would follow the same pattern as the findings in this study indicated. Second, the studied case is currently unfolding, which made it challenging to draw final conclusions about barriers, consequences and outcomes. Gathering more information about this on a later stage would significantly add insights to this process. Lastly, the data material of this study was very extensive. Although this can act as a strength of the study, it also made it challenging to prioritize the findings and discussions. It would be ideal to thoroughly examine the topics and discussions presented by the research questions to get an in-depth understanding. Because of the scope of a master’s thesis, this study only presents a little contribution to the literature and could act as a starting point for further analysis.

6.4 Suggestions for further research

It became clear that most of the research on innovation processes at hospitals focused on medical innovations related to diagnoses and treatment. Enhancing the knowledge-base on practice-based innovativeness at hospitals and their role in organizational development is important and interesting. Particularly, a further exploration of how hospitals work with generating organizational innovations and how this can be facilitated through an increased focus on collaboration. Research on open innovation in a hospital context would be of particular interest. The amount of changes that has been enforced at Oslo University Hospital based on suggestions from hospital staff can point to the direction of employee-driven innovation. From this study, there seems to be a great potential for employee-driven innovation that can be exploited and further researched.

The study of the use of the Lean framework in a hospital context is potentially interesting, as it is so widely applied. This has not been studied in the context of hospitals and innovation. This study has thus opened up a window to further investigate this relationship. It would have
been interesting to conduct a quantitative study with a larger survey exploring what health care professionals understand Lean as and how they apply it. In addition to explore if there is a trend to organize Lean and innovation separate, and if this has implications for innovativeness.

A purpose of this study was to provide a greater understanding of the concepts case pathways and cancer patient pathway. The case is highly complex and includes more questions that must be addressed. However, due to the scope of this study, it was not manageable to conduct a more in-depth study. Hopefully, this thesis has contributed to some clarity of the concepts and spurred interest of other innovation scholars to continue following the outlined pathways further.
List of references


Oslo University Hospital Comprehensive Cancer Centre. (2017). *Annual report 2017 Oslo University Hospital Comprehensive Cancer Centre*. Oslo: Oslo University Hospital.


## Appendix

### Appendix 1 List of informants

<table>
<thead>
<tr>
<th>Informant</th>
<th>“Position”</th>
<th>Date</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gatekeeper</td>
<td>Member of Comprehensive Cancer Centre Board</td>
<td>10.10.2018</td>
<td>1 hour</td>
</tr>
<tr>
<td>Informant C1</td>
<td>Related to pathway 1</td>
<td>16.1.2019</td>
<td>50 minutes</td>
</tr>
<tr>
<td>Informant C2</td>
<td>Related to pathway 1</td>
<td>25.1.2019</td>
<td>50 minutes</td>
</tr>
<tr>
<td>Informant C3</td>
<td>Related to pathway 2</td>
<td>25.1.2019</td>
<td>50 minutes</td>
</tr>
<tr>
<td>Informant C4</td>
<td>Nurse</td>
<td>4.2.2019</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Informant C5</td>
<td>Involved in the implementation of cancer patient pathways and a member of the Network for Continuous Improvement</td>
<td>31.1.2019</td>
<td>50 minutes</td>
</tr>
<tr>
<td>Informant C6</td>
<td>Related to pathway 3</td>
<td>1.4.2019</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Informant S1</td>
<td>Pathway supervisor</td>
<td>31.1.2019</td>
<td>1 hour 15 minutes</td>
</tr>
<tr>
<td>Informant S2</td>
<td>Member of the Network for Continuous Improvement</td>
<td>01.02.2019</td>
<td>50 minutes</td>
</tr>
<tr>
<td>Informant S3</td>
<td>Member of the Innovation Department</td>
<td>12.02.2019</td>
<td>50 minutes</td>
</tr>
<tr>
<td>Informant S4</td>
<td>Works in the Section for Organizational Development</td>
<td>20.2.2019</td>
<td>1 hour</td>
</tr>
<tr>
<td>Informant S5</td>
<td>Member of the Innovation Department and the Network for Continuous Improvement</td>
<td>13.3.2019</td>
<td>1 hour</td>
</tr>
<tr>
<td>Informant x</td>
<td>Expert interview, organizational development in hospitals</td>
<td>5.4.2019</td>
<td>1 hour</td>
</tr>
</tbody>
</table>
## Appendix 2: Overview of Support Functions at Oslo University Hospital

<table>
<thead>
<tr>
<th>Support functions</th>
<th>Role related to cancer pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Section for Organizational Development</td>
<td>Works both top-down and bottom-up. Help clinics and departments with planning and implementing novel changes, as well as assisting in projects initiated from the clinics.</td>
</tr>
<tr>
<td>Comprehensive Cancer Centre Board</td>
<td>Oversees the work on cancer pathways. Contributes with coordination of development of the cancer patient pathway. They shall act as the principal driver to enhance the quality of the pathways. This means supporting and ensuring learning and safeguarding processes for continuous improvement. In addition, they develop and follow up OUH’s cancer strategy. The board is led by the head of the cancer clinic at the hospital and have representatives from every clinic related to cancer treatment. A central task is to share information with all involved parts in patient pathways. Monthly progress reports related to goal achievement of normative times are sent to the pathway managers. Pathways that struggles with achieving the goals get detailed reports. In addition, meetings with pathway management groups are held with the purpose to look at patient survival and normative times.</td>
</tr>
<tr>
<td>The Innovation Department</td>
<td>Have not been largely involved with cancer pathways, with the exception of the project ‘Breast 1-2-3’ related to the breast cancer patient pathway. The department are usually included if projects generate larger changes and improvements.</td>
</tr>
<tr>
<td>The Network for Continuous Improvement</td>
<td>Representatives from the Network are largely involved with cancer pathways. Have assisted with facilitating workshops and projects and acted as facilitators in the implementation of case pathways.</td>
</tr>
<tr>
<td>“Resource group”</td>
<td>Work on improvement through analyzing pathways and contribute to implement measures because the overall achievement of delivering care within the normative times are poor.</td>
</tr>
</tbody>
</table>
Appendix 4 – Clinics significantly involved in cancer care

X = Significantly involved in cancer care/research
Appendix 5 – Example of flow chart of cancer patient pathway
Appendix 7: Interview Guide - Support Functions (In English translation)

Background
1. Can you briefly explain your position in the hospital and your background?

Implementation of case pathways
2. Do you have experience with cancer patient pathways?
   a. If yes, how were you involved?
   b. Have you observed if this has led to changes in the service delivery of cancer treatment, collaboration, organization etc.?
3. What benefits and challenges did the implementation (and further improvement of cancer patient pathways) lead to?
   a. Which measures have you taken for dealing with bottlenecks and challenges?

Work on improvement
4. How does OUH work with improving their services?
   a. Does it entail having do make changes in the organization?
5. Are there any factors at OUH that affects the development?
6. How do you capture and implement improvements at the hospital?
   a. Is it encouraged to come up with suggestions or report problems?
   b. How are you involved in development?
   c. How do you work with development (methods, processes, collaborations)
   d. Do you have any examples of implemented improvements?
7. How are the patients involved in the development and improvement of services?
8. What type of knowledge are important when working with improvement?

Collaboration
9. How do you think the interaction and collaboration at OUH works?
   a. Do you share experiences across departments?
   b. Do you have a close collaboration with other support functions?

Perception of innovation
10. What does innovation mean to you?
11. What are the most important drivers for generating innovation?

Appendix 8: Interview Guide – Clinicians (In English translation)
Background
1. Can you briefly explain your position in the hospital and your background?

Implementation of case pathways
2. How was the case pathway implemented and had it been established a functional cancer patient pathway beforehand?
   a. How were you affected by the implementation? Did something change in the daily work activities you are involved in?
3. What other changes have this meant for the service delivery of cancer treatment, collaboration, organization etc.?
4. What benefits and challenges did the implementation (and further improvement of cancer patient pathways) lead to?
   a. How did you work on solving the problems and challenges?

Working on improvements
5. How do you capture and implement improvements in the pathways?
   a. Are you encouraged to come up with suggestions and report problems?
   b. How are you involved in the development?
   c. What are the most important drivers for improving the services?
6. Do you have any examples of implemented improvements or changes?

Collaboration
7. How do you think the interaction and collaboration at OUH works?
   a. How does it work within the pathway?
   b. Have you shared experiences with another pathway or others?
8. How are the patients involved in the development and improvement of services?
   a. Have you noticed any difference in how the experience cancer treatment now as to before the pathways?

Innovation
9. If you could enforce any change you wanted to, what would you do?
10. What does innovation mean to you?